



Boosting productivity in the services sector

Boosting productivity in the services sector

May 2014

The New Zealand Productivity Commission

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Foreword

The services sector touches the lives of all New Zealanders many times every day; for example, going to the bank, using a mobile phone, watching television or doing the shopping. Three-quarters of New Zealanders make their living working in the sector. Those who work in the other sectors still depend on services, as those sectors use services extensively as inputs.

The sector accounts for more than 70% of New Zealand's gross domestic product, and for more than half of exports when service inputs to merchandise exports are included. The productivity of the sector strongly affects the productivity of the economy as a whole.

New Zealand's productivity performance is below par compared with OECD peers. Given the services sector's increasingly important economic role, improving its productivity would boost national living standards. Against this background, the Government asked the Commission to undertake an inquiry into the services sector and to identify opportunities to improve its productivity.

To approach this task, we assessed a huge amount of information about the sector's productivity performance and interactions with the rest of the economy. We sought to understand what drives productivity and the barriers to productivity improvement. It quickly became evident that many factors affect productivity in this large and diverse sector. We chose to focus on two particularly important issues, which influence productivity growth across the sector:

- the role of competition and how it can be enhanced; and
- how the sector applies information and communications technology (ICT). ICT is transforming existing services and creating new ones, and research has established strong links between the adoption of ICT and productivity.

We identified ways to sharpen competition and also changes that would help firms to harness ICT more effectively. While the enterprise and diligence of individual New Zealanders drives productivity growth, a supportive policy environment is also important. Our recommendations will help the Government to significantly improve that environment.

The Commission has consulted widely, receiving 56 submissions and holding more than 60 meetings with participants. This has contributed enormously to our understanding of the issues and to our recommendations. I would like to thank all those who provided this valuable information.

Professor Sally Davenport, Dr Graham Scott and I oversaw the preparation of this report. We acknowledge the work and commitment of the inquiry team: Geoff Lewis (inquiry director), Dave Heatley, Terry Genet, Ron Crawford, Jonathan Dallaston, Linda Dougherty and Bruce White, and the other Commission staff and external providers who made important contributions. We also thank members of the ICT reference panel who provided valuable insights and expertise.



MURRAY SHERWIN

Chair

May 2014

Terms of reference

Boosting productivity in the services sector

Context

1. Services are often described as things you can buy or sell but cannot carry. From browsing the internet, dining out, buying and selling a home to receiving an education or medical treatment, services make up a wide and diverse range of activities that impact on the lives of all New Zealanders on a daily basis.
2. The services sector stands out in New Zealand's economy, accounting for over 70 percent of registered businesses, national output and employment. Services make up a critical part of New Zealand's export revenue. In 2009, New Zealand's services exports were valued at \$12.7 billion and represented 22 percent of all exports. Travel and transportation services accounted for 77 percent of services exports.
3. Furthermore, services form a valuable input to many of New Zealand's exports. Nearly half of the value of New Zealand's exports can be attributed to value-added from the services sector.
4. Despite the clear importance of the services sector to the New Zealand economy, relatively little is known about the impact and drivers of service sector productivity. Measurement can be difficult, but overseas experience suggests that there is considerable variability in the degree to which countries have benefited from improved services productivity growth. In New Zealand, there has been considerable variation in productivity performance across the services sector.
5. Improving productivity in the services sector would contribute to a number of Government goals including to materially lift New Zealand's long-run productivity growth rate while maintaining our high rate of labour force participation, and to increase the ratio of exports to GDP to 40% by 2025.
6. Given the significance of the services sector to New Zealand's economy but the relatively small amount of study into the sector's productivity performance, the Government is commissioning a Productivity Commission Inquiry into Boosting Productivity in the Services Sector.

Purpose and scope

7. The purpose of the inquiry is two-fold: to provide an overview of the role of services in the New Zealand economy and to provide policy options to lift productivity in the services sector.

A. The role of services in the New Zealand economy

8. This part of the inquiry should provide an overall assessment of the role and performance of the services sector in New Zealand. This assessment should:
 - a) describe the recent productivity performance of the services sector, including the extent to which employment has shifted from high to low productivity sectors;
 - b) assess the impact of the services sector on the New Zealand economy overall, including how it affects the performance of the primary and manufacturing sectors; and
 - c) assess the performance of the New Zealand services sector against the experience of OECD and other small open economies.

B. Policy options to lift productivity in the services sector

9. Given the diversity of industries within the services sector, policy recommendations and lessons for lifting productivity are likely to be better informed by looking at selected issues or parts of the sector in more depth.
10. Informed by part A above, this part of the inquiry should provide detailed analysis on a selection of issues that are critical for lifting productivity in the relevant parts of services sector. This analysis should lead to policy recommendations to lift productivity in those parts of the services sector.

11. The Commission should have regard to the following criteria when determining the issues or parts of the sector on which it will undertake more in-depth analysis:
- a) whether the issues or parts chosen for further analysis have the potential to make a significant impact on New Zealand's overall productivity performance;
 - b) the extent to which the analysis will be able to identify impediments to increasing productivity in the services sector and lead to concrete recommendations for changes to government policy which can overcome those impediments.
12. In applying the criteria above, the Commission should take into account the following aspects when determining the issues or parts of the sector on which it will undertake in-depth analysis:
- c) The increasing importance of services to GDP, to global trade, and as a contributor to the Government's goal of lifting the ratio of exports to GDP to 40% by 2025.
 - d) The wide variation in the productivity performance of services subsectors and industries, and the ability to draw lessons from high performing subsectors (for example financial and insurance services) and to lift productivity in relatively poor performing subsectors (for example administrative and support services).
 - e) The importance of information and communications technology in other OECD countries as a contributor to strong productivity growth and as an explanation for differences in productivity growth across countries.
13. The Commission should seek views from interested parties when determining the services sector issues on which it will undertake in-depth analysis.

Other matters

14. Consideration of productivity in the services sector should be limited to market-provided services and therefore exclude study of services provided directly by the public sector. The Government has a wide programme underway to improve public sector productivity, detailed consideration of this sector is not possible within the time available to the Commission, and measurement issues in this sector also make analysis difficult.
15. The Commission should prioritise its effort by using judgement as to the degree of depth and sophistication of analysis it applies to satisfy each part of the Terms of Reference. In making this prioritisation, the Commission should emphasise the importance of making concrete policy recommendations in part B that maximise the impact on New Zealand's overall productivity performance.

Consultation requirements

16. In undertaking this inquiry the Commission should consult with key interest groups and affected parties.

Timeframe

17. The Commission must publish a draft report and/or discussion paper(s) on the inquiry for public comment, followed by a final report, which must be submitted to each of the referring Ministers by the end of April 2014.¹

Referring Ministers

Hon Bill English, Minister of Finance

Hon Steven Joyce, Minister for Economic Development

¹ Originally the end of February 2014.

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KEY


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Findings


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Recommendations

Commonly used terms and abbreviations

Term	Description
adjustment costs	The costs to a firm and its employees resulting from changing, for example, the technology or business model it uses.
agglomeration	<i>Agglomeration</i> refers to the spatial concentration of economic activity – essentially firms and workers co-locating in cities. Agglomeration can reduce the costs of transporting goods, people and ideas.
allocative efficiency	Maximum <i>allocative efficiency</i> requires the production, from a given amount of resources, of the set of goods and services that consumers most value.
Australia New Zealand Standard Industry Classification (ANZSIC)	A system used to compile and analyse industry statistics in New Zealand and Australia. <i>ANZSIC96</i> and <i>ANZSIC06</i> refer to the 1996 and 2006 versions respectively.
behind-the-border barriers	Barriers to international trade that operate inside a country. Examples include the cost of complying with domestic regulation such as labelling requirements and restrictions on foreign companies' operations and investment.
capital deepening	An increase in capital intensity; that is, in the amount of machinery, equipment etc. for each worker.
cloud computing	<i>Cloud computing</i> lets businesses remotely access computer infrastructure, software and data services, including from overseas. See Chapter 11 for a more detailed definition.
competition	Rivalry among firms in a market, where businesses strive to attract or keep customers. <i>Competition</i> often leads firms to offer lower prices or better-quality products.
convergence	The proposition that the per-capita income of poorer countries should, over time, rise to meet that of the richest economies as capital and ideas flow from richer to poorer countries in search of higher returns.
cost-benefit analysis	A systematic process for calculating and comparing the advantages and disadvantages of a project, decision or government policy.
creative destruction	In economics, this describes the dynamic process of competition whereby innovations replace older technologies. New goods and services, new firms and new industries compete with existing ones in the marketplace, leading to the reallocation of resources towards successful existing firms and new firms, and away from less successful existing firms and dying firms.
credentialing	The assessment of skills and the issuing of a credential to recognise those skills by a party other than the training provider.
data sovereignty	The concept that digital information is subject to the laws of the country in which it is stored. <i>Data sovereignty</i> issues arise when security, privacy and ownership rules differ between countries, creating risks for users of international cloud computing services.
demand-side	Market activity, influences or conditions related to customers, such as the effect of well-informed customers on economic outcomes.
diffusion	The process by which a new idea, technology or product is adopted across a society or economy.
directly-traded services	When the producer and consumer of a service are not normally co-located, a service is <i>directly traded</i> whenever: (a) the consumer moves to the producer's location; (b) the producer moves to the consumer's location; or (c) the service itself is delivered across a distance.

Term	Description
dispersion	The amount of variation within members of a group. <i>Firm productivity dispersion</i> , for example, is the spread between high-productivity and low-productivity firms.
distributive industries	Service industries that focus on transporting people, and exchanging or moving goods. The industries in this group are wholesale trade, retail trade, and transport, postal and warehousing.
dynamic efficiency	<i>Dynamic efficiency</i> is achieved when optimal decisions are made on investment, innovation and market entry and exit, to create productive and allocative efficiency in the longer term.
economically significant	Prices are <i>economically significant</i> when they have a significant influence on the amounts that producers are willing to supply and on the amounts purchasers wish to buy.
economies of scale	Reduction of cost per unit as the volume of production increases, due to large up-front or fixed costs being spread across more units.
elastic	In the context of cloud computing, a service whose capacity expands and contracts quickly (in seconds or minutes) to match fluctuations in demand.
entry or exit barriers	Obstacles that make it difficult for a firm to begin or end participation in a market. Common <i>barriers to entry</i> are government regulations, patent requirements and licensing restrictions. Common <i>barriers to exit</i> are redundancy costs, contract termination fees and non-transferable fixed assets.
false negative	A test that fails to identify an offender has generated a <i>false negative</i> . For example, a drug test unable to detect a performance-enhancing drug would generate a <i>false negative</i> .
false positive	A test that identifies a non-offender as an offender has generated a <i>false positive</i> . For example, an alcohol test that classified sober drivers as drunk would be generating false positives.
foreign direct investment (FDI)	An investment in a new or existing business in a country by an individual or company of another country and resulting in full or substantial ownership.
general purpose technology (GPT)	A revolutionary and far-reaching technology that enables further innovation across the economy. Historical examples are steam power, the internal combustion engine and electricity. See Chapter 8.
global financial crisis (GFC)	The economic downturn that started with a financial crisis in the United States in 2007 and peaked in 2008.
goods-producing sector	The part of the economy consisting of the manufacturing, construction, electricity, gas, water and waste industries. Industries in the <i>goods-producing sector</i> span varying degrees of transformation, from initial processing of primary produce (such as frozen meat) to elaborately-transformed manufactured items (such as electronics).
gross domestic product (GDP)	The market value of goods and services produced within an economy in a given time period. <i>GDP</i> per capita is widely used as an indicator of a country's standard of living.
incumbent	In economics, an <i>incumbent firm</i> is an established business with a strong position in the market.
industry	A group of businesses with the same main activity, as classified in ANZSIC; for example, retail trade.
information and communications technology (ICT)	Telecommunications, broadcast media and information technology. <i>ICT</i> is a more encompassing term than <i>IT</i> , and stresses the innovative role of unified communications and integrated digital networks in economic activity.

Term	Description
information asymmetry	A market situation where one participating party has more or better information than the other party.
information industries	Service industries that focus mainly on managing or creating knowledge. These industries typically use ICT extensively and are highly innovative. The industries in this group are information media and telecommunications; finance and insurance; and professional, scientific and technical services.
information technology (IT)	Computer-based information systems, networks and software.
infrastructure-as-a-service (IaaS)	One of the three service models of cloud computing. <i>Infrastructure-as-a-service</i> lets users rent access to computer hardware such as storage, processing power, server space and networking components at other locations.
innovation	The process of translating an idea or invention into a good or service that has value.
intangible assets	Assets that are identifiable but are not physical, such as reputation and brands, skills, market research and patents.
intermediate input	A good or service that is used to produce other products, rather than being consumed by households. One example is steel ingots that firms buy and sell as part of a manufacturing process.
labour productivity	Average output per unit of labour input (usually taken to be an hour of work).
latency	The delay incurred in transporting data over a distance.
market power	A firms' ability to manipulate price by influencing a product's supply or demand. A firm with <i>market power</i> can increase what they charge for a good or service without losing all of their customers to a competitor.
market-provided services	Services that are provided at economically-significant prices, usually to generate a profit.
measured sector	The measured sector is the industries included in Statistics New Zealand's standard productivity statistics from 1996 to 2011, covering all predominantly market industries. The measured sector covered 81% of New Zealand's GDP in 2009. The "sector" cuts across the three sectors of the economy, that is, primary, goods-producing and services.
modes (of services trade)	The distinct ways in which services can be traded at a distance. The General Agreement on Trade in Services international treaty defines four modes (modes 1 to 4), and this report introduces a fifth. See Chapter 2.
monopoly	A situation where one firm is the only supplier of a product. A <i>monopoly</i> is characterised by an absence of competition, which often leads to high prices and inferior products.
multi-factor productivity (MFP)	Change in output that cannot be attributed to changes in the level of labour or capital input. It captures factors such as advances in knowledge, and improvements in management and production techniques.
mutual recognition	Two countries that agree to recognise each other's laws or regulations. (See also <i>unilateral recognition</i>).
non-market provided services	Services that are supplied for free or below economically-significant prices, typically by governments or non-profit organisations. Health care and social assistance, education and training, and public administration and safety are the three service industries with the highest share of non-market provision in New Zealand.
occupational licensing	A system which controls entry and standards of practice within a particular occupation to those that meet a set of requirements or guidelines.

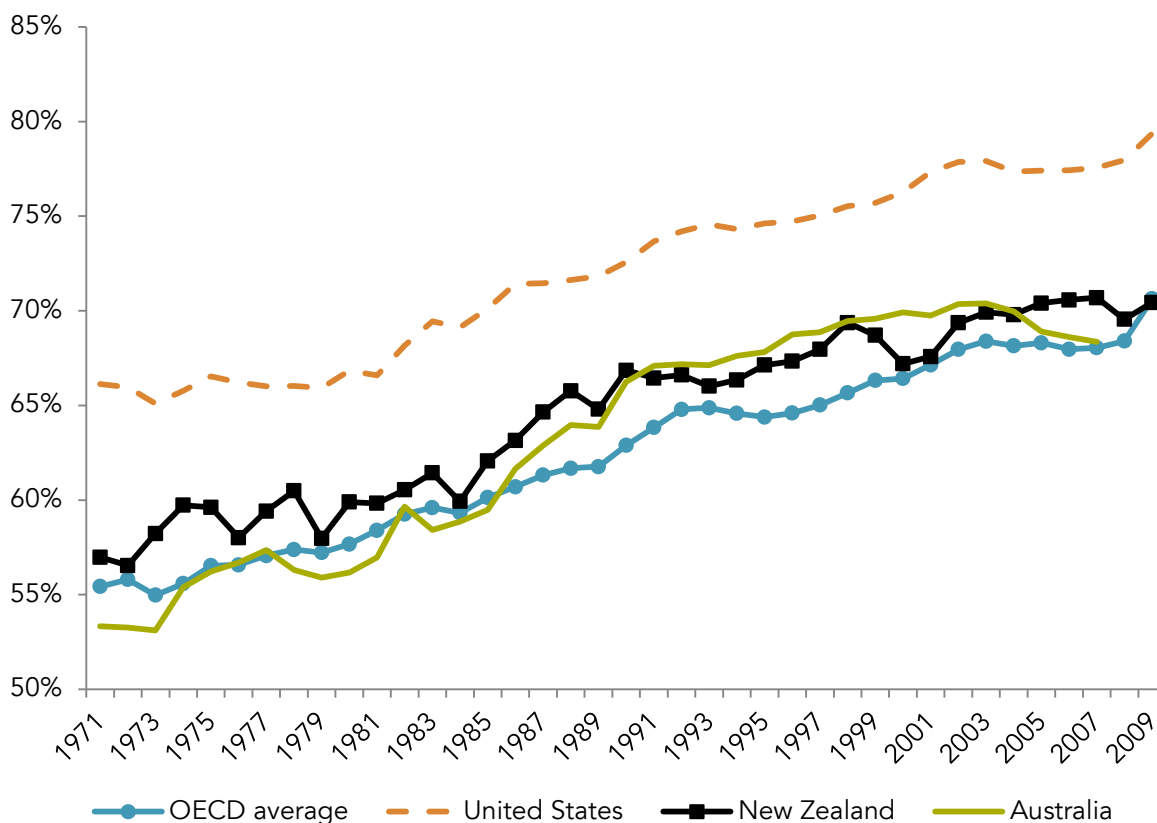
Term	Description
outward direct investment (ODI)	Investment by New Zealanders in a new or existing business in another country and resulting in full or substantial ownership.
perfect competition	A market structure where no individual seller or buyer can influence market prices. Buyers and sellers must be numerous and well informed.
person-centred industries	Service industries that are highly person-specific. The industries in this group are accommodation and food, rental hiring and real estate, administration and support, arts and recreation, and other services.
platform-as-a-service (PaaS)	One of the three service models of cloud computing. <i>Platform-as-a-service</i> lets users rent tools for building software applications over the internet, for example to develop and host complex websites and applications in the cloud
primary sector	The part of the economy made up of the agriculture, forestry and fishing, and mining industries. These industries use natural resources to produce relatively unprocessed goods.
production perspective	A view of the services sector that emphasises commonalities in what firms do and the nature of their inputs. See Chapter 2.
productive efficiency	Maximum <i>productive efficiency</i> requires that goods and services are produced at the lowest possible cost. This requires maximum output for the volume of specific inputs used, plus optimum use of inputs given their relative prices.
productivity	A measure of output per unit of input.
productivity frontier	The world <i>productivity frontier</i> reflects the cutting edge of technology at the global level. It determines the maximum amount of goods and services that can be produced with a given quantity of inputs.
purchasing power parity (PPP)	The rates of currency conversion that equalise the purchasing power of different currencies. <i>PPPs</i> are indicators of price level differences across countries for the same good or service.
reallocation	The transfer of employees, capital or other resources from one firm, industry or region to another. As new technology develops, <i>reallocation</i> is required to put assets to their most productive use.
research and development (R&D)	Creative work of firms or governments that is carried out systematically with the goal of discovering solutions to problems or creating new goods and services.
scalability	A production technology is <i>scalable</i> if it can be efficiently applied at a wide range of output levels.
scale	In economics, the size of a commercial operation. <i>Large-scale</i> firms are often able to produce goods and services at a lower cost per unit of output. (See also <i>economies of scale</i>).
search costs	The time and effort needed to find a suitable supplier of a service or good. A business or individual will face high <i>search costs</i> if little information about potential suppliers is available, or if it is hard to identify which option best suits their needs.
sector	Statistics New Zealand classifies productive activities in the economy into three sectors: primary, goods-producing and services.
sensitive land	In the context of foreign direct investment, <i>sensitive land</i> is land of a particular type, such as farm land, that exceeds a particular area threshold, as detailed in the Overseas Investment Act 2005.
server	In computing, a <i>server</i> is a dedicated computer (with suitable software) that responds to requests across a data network to provide one or more services.
services sector	The part of the economy made up of all the service industries.

Term	Description
small and medium enterprises (SMEs)	Often defined in New Zealand as firms with fewer than 20 employees. In OECD countries, most commonly defined as firms with fewer than 250 employees.
software-as-a-service (SaaS)	One of the three service models of cloud computing. <i>Software-as-a-service</i> lets users access software applications over the internet. Applications include accounting, sales tracking and business planning.
spatial transaction costs	The extra costs incurred because production and customers are not co-located. <i>Spatial transaction costs</i> include transport costs, tariffs and regulatory barriers.
structural change	A shift in the composition of an economy, usually through one sector growing or shrinking relative to other sectors. For example, emerging countries undergo <i>structural change</i> as large numbers of agricultural workers move to manufacturing jobs.
sub-industry	A group of businesses within an industry that have more specific main activities. This term corresponds to subdivisions, groups and classes in ANZSIC. For example, "legal and accounting services" is a <i>sub-industry</i> of "professional, scientific and technical services".
supply-side	Market activity, influences or conditions related to producers of goods and services.
switching costs	The real or perceived costs of changing to a new supplier. <i>Switching costs</i> include contract termination fees and the work needed to adjust to a new product.
tradable	A characteristic of a product, meaning that it can be sold in a location other than where it is produced. <i>Tradability</i> varies by product and crucially depends on the costs of transacting at a distance. <i>Perfectly tradable</i> products should cost the same (adjusted for currency) wherever they are bought. <i>International tradability</i> is the extent to which a product is tradable across international borders. <i>Domestic tradability</i> is the extent to which a product is tradable between regions within a country.
transaction costs	Costs incurred by the parties making an economic exchange, other than the amount paid directly for the good or service purchased.
transaction perspective	A view of the services sector that takes account of features of services, and ways in which they are bought and sold, that distinguishes services from goods. See Chapter 2.
transport costs	The costs of conveying a product from the producer to the customer, the producer to the point of consumption, or the customer to the point of production.
unilateral recognition	Recognising another country's laws or regulations for compliance purposes. For example, if a product meets sale requirements in Country A, it can be sold in Country B without needing to meet Country B's regulatory requirements. (See also <i>mutual recognition</i>).
value-added	<i>Industry value-added</i> is the price of the output of an industry, less the cost of inputs that other industries provide. <i>Export value-added</i> is the price of exported goods and services, less the cost of imported inputs used in their production.

Overview

The services sector is a dominant force in New Zealand's economy, accounting for around 70% of gross domestic product (GDP) and over half of the value of total exports, when service inputs to merchandise exports are included. The sector is growing and is closely linked to the rest of the economy. Its productivity strongly affects the productivity of the economy as a whole and the wellbeing of New Zealanders.

Figure 0.1 Services sector share of GDP compared internationally, 1971–2009



Source: Chapter 2, Figure 2.2.

New Zealand's productivity performance is below par compared with its OECD peers. Reflecting this and the economic importance of services, the Government asked the Commission to undertake an inquiry into the services sector and to identify opportunities to boost its productivity.

The inquiry had two main aims:

- to build a better understanding of the services sector, its recent performance, and its role in the economy; and
- to identify opportunities to boost productivity in the services sector and its contribution to New Zealand's overall productivity.

What are services?

Informally, services are "the things you can buy or sell but cannot carry". "Buy or sell" points to the fact that services are often the subject of market transactions. "Cannot carry" reflects that services are generally *intangible*; that is, they do not have a stable physical presence.

Intangibility complicates market transactions. It can make it more difficult to determine what is on offer, whether a trade has taken place and to negotiate a remedy for inadequate quality. Many services rely on face-to-face delivery, which reduces the scope for long-distance trading.

The Commission has relied on the classifications adopted by statistical agencies to define *service firms* (those whose main output is services), *service industries* (groups of firms producing similar services) and the *services sector* (all service industries). The other two sectors are the *goods-producing sector* and the *primary sector*.

Why does the productivity of the services sector matter?

The sector is such a large proportion of the total economy that even small productivity improvements affect the performance of the economy overall. Its contribution can be considered from four viewpoints.

From a *labour force* viewpoint, the majority of working New Zealanders make their living in the sector.

From a *consumption* viewpoint, New Zealanders consume services many times every day.

From a *production* viewpoint, the sector is closely interconnected with the rest of the economy. Services are commonly used as inputs to produce goods and other services. More services are purchased by firms, as inputs to their production, than by households. Firms in the primary and goods-producing sectors spend nearly 40% more on market-provided services than on wages and salaries.

From the viewpoint of *international trade*, services contribute both directly and indirectly.

- Directly-traded services contribute 22% of New Zealand's total exports, a proportion comparable to other OECD economies.
- Services are exported indirectly through their contribution to the production of exported goods.
- Services are also exported indirectly by New Zealand firms with a physical presence in other countries, although this form of exporting is small relative to other OECD countries.

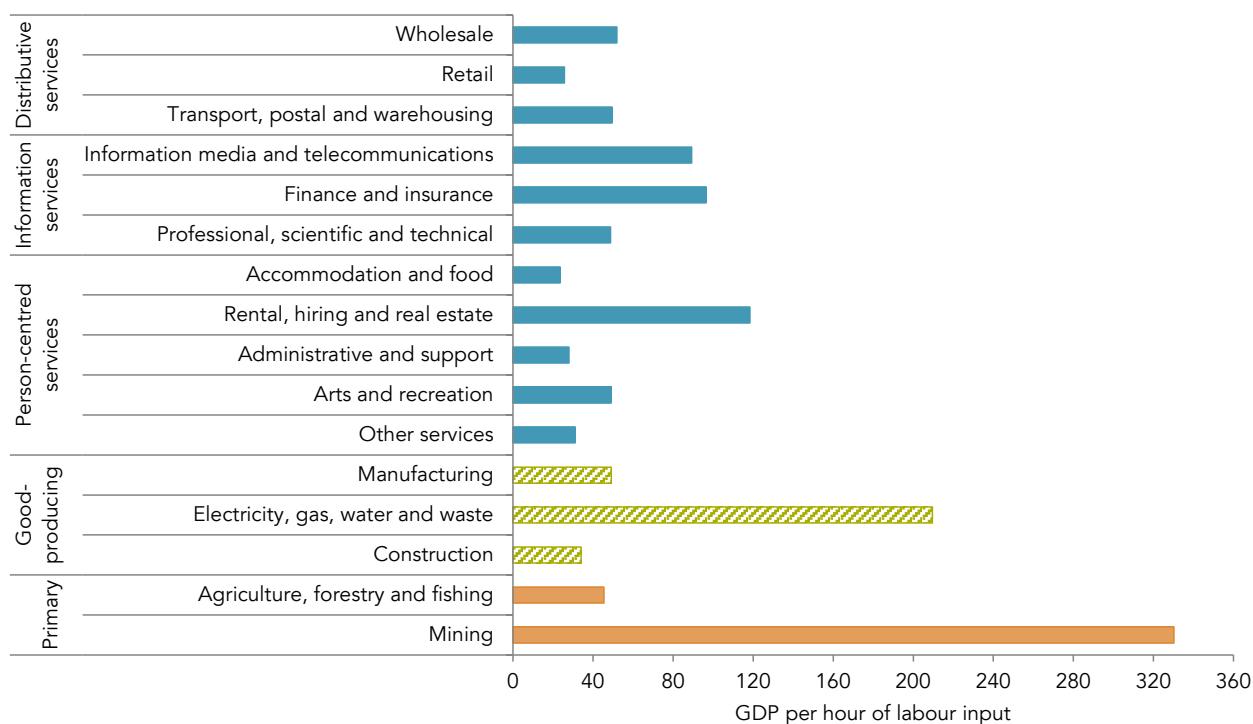
How well has the services sector performed?

The productivity level and growth rate of New Zealand's services sector are below the average of a group of OECD countries for which the Commission was able to obtain comparable data. However, within the sector, individual service industries exhibit big differences in performance. Some (eg, finance and insurance, and information media and telecommunications) are top productivity performers. Others (eg, retail, and accommodation and food services) generally have low productivity levels and growth rates. Figure 0.2 shows labour productivity levels across industries in all three sectors.

The contribution of individual service industries to the economy's aggregate productivity performance depends on each industry's productivity and size. The faster an industry's productivity growth, and the bigger the industry, the larger its contribution. Service industries vary greatly in their contributions to aggregate labour productivity growth. The largest contributions come from the information media and telecommunications industry, and the rental, hiring and real estate industry. At the other end of the spectrum, a number of low-productivity-growth service industries have detracted from aggregate labour productivity growth. Among these are the professional, scientific and technical services industry, and the administrative and support services industry.

The economy's overall productivity performance will suffer if low-productivity industries expand their employment relative to high-productivity industries. However, the Commission's analysis found that such shifts had only a minor negative effect on aggregate productivity growth. Most growth in aggregate productivity arose from growth within industries rather than from shifts in employment between industries.

Figure 0.2 Labour productivity levels, GDP in NZ\$ per hour of labour input, by industry, 2011



Source: Chapter 3, Figure 3.7.

Competition and ICT: two topics for in-depth analysis

The terms of reference directed the Commission to choose specific topics for in-depth analysis, applying two main criteria:

- the potential to make a significant impact on New Zealand's overall productivity performance; and
- the ability to identify impediments to increasing productivity and lead to concrete recommendations for changes to government policy that can overcome those impediments.

The Commission chose two topics:

- stimulating competition in service markets; and
- the application of information and communications technology (ICT) by New Zealand service firms.

Competition and the use of ICT are important drivers of productivity growth across the economy but their effects are particularly important in the services sector. Policy improvements in these areas have the potential to boost productivity across the services sector.

How does competition affect productivity in the services sector?

The intensity of competition between firms in an economy affects the level and growth rate of productivity. Competition drives the efficient use of resources and the innovations that sustain productivity growth. Barriers to competition generally diminish productivity growth.

There is no single measure of the intensity of competition. The report presents four complementary indicators to provide an overall assessment of the intensity of competition across New Zealand's service industries. Competition varies considerably between industries. At the aggregate level, the finance and insurance; rental, hiring and real estate; retail; and professional, scientific and technical industries appear to have less intense competition than other industries.

Opportunities to increase competition in the services sector

Many policy instruments affect competition. The main opportunities to strengthen competition to help increase productivity in the services sector are:

- reducing barriers to trade;
- enhancing the capacity of consumers to drive competition; and
- sharpening competition law.

Reducing barriers to trade in services

Geographic remoteness and small domestic markets partially explain why competition in New Zealand's service markets is less intense than in some other countries. Exposure to foreign competition can increase the intensity of competition, but is limited by screening of foreign direct investment, and by requirements that foreign firms comply with local regulations different from those in other markets.

In its 2012 study of trans-Tasman economic relations, conducted jointly with the Australian Productivity Commission, the Commission made a number of recommendations for reducing barriers to trans-Tasman trade in services. The Government should complete the implementation of those recommendations and build on them by reducing barriers to international trade in services with other countries.

Enhancing the role of consumers

By seeking the best value, consumers play an important role in the competitive process. However, search costs (ie, finding a preferred supplier) and switching costs (ie, changing suppliers) are particularly pronounced in some service markets. These costs can reduce competition by making it difficult for consumers to compare different service providers and respond to price and quality signals.

Well-informed consumers that are able to switch between suppliers, increase the intensity of competition. Some switching costs cannot be avoided, and some can even intensify competition, if suppliers expect that such costs will help them to retain new customers. However, if switching costs exceed efficient levels, customers can become locked in. Similarly, competition can be diminished if service offerings become so complicated that consumers face prohibitive costs in evaluating competing service offerings in order to identify the best option.

The inquiry considered four ways to reduce switching and search costs, through improving:

- comparison websites;
- information disclosure;
- contract termination arrangements; and
- processes for switching service providers.

Comparison websites

Comparison websites reduce search costs by comparing prices and other product attributes. Privately-owned comparison sites are less common in New Zealand than in some other countries, possibly because of the small size of New Zealand markets. The Commission has not identified other barriers to entry.

The Government might consider funding or providing additional websites in order to reduce search costs. However, before doing so the Government should demonstrate that this would increase competition, would not crowd out private providers, and would pass a cost-benefit test. Any such websites should be funded sufficiently to ensure that they remain accurate and accessible.

Other countries have developed best-practice guidelines and accreditation systems as a form of oversight of comparison websites. However, the existing provisions in the Fair Trading Act 1986, in conjunction with

the regular monitoring activities of the Commerce Commission, provide sufficient oversight and there is no need for a government-sponsored accreditation system.

Information disclosure

Government-mandated information disclosure is another way to reduce search costs in service markets. For example, KiwiSaver providers are now required to regularly disclose standardised information about their performance and fees. While complying with information-disclosure requirements imposes some costs on providers, the requirements are a relatively light-handed way to reduce search costs. For disclosure to be effective, the information must be presented in ways that consumers can access and understand.

Contract termination arrangements

Many services, such as telecommunications, are provided through contracts. While contracts can benefit consumers, they impede switching if they contain unreasonable terms that unduly discourage consumers from ending the contract. Recent legislation prohibits the use of certain “unfair contract terms” and should resolve this problem.

The Ministry of Business, Innovation and Employment should review the impacts of the new provisions on unfair contract terms introduced in the Fair Trading Amendment Act 2013, within two to four years of the Act coming into effect. This new law currently applies only to consumers of services who are householders rather than businesses. Given that businesses rely heavily on services as inputs, the review should examine business-to-business contracting arrangements to establish whether there is any evidence of practices that are harmful to competition.

Processes for switching service providers

An industry-led initiative introduced a streamlined process for switching banks in 2010. While the process appears to significantly reduce the barriers to switching banks, it should be better publicised and more transparent. Payments NZ should collect and publish statistics that show the number of bank switches each year and how long the switching process takes.

Switching banks could be further streamlined by making bank account numbers portable, enabling customers to keep their account numbers. However, there are significant practical barriers to full bank account number portability. New Zealand officials should monitor international developments and, if another country develops a workable approach, should examine the value of applying it in New Zealand.

Telephone number portability has reduced switching costs for consumers and strengthened competition among telecommunications providers. The absence of email address portability is a remaining barrier to switching for consumers who use the email address offered by their internet service provider. The New Zealand Telecommunications Forum should investigate mechanisms to enable business and residential customers to switch internet service providers without losing access to emails. If a viable low-cost option exists, it should be implemented.

Occupational regulation and professional bodies should promote competition

Occupational regulation regimes are common in the services sector (eg, in engineering, legal, accounting and architectural services). These regimes often help consumers to choose a service supplier, by providing information about suppliers’ qualifications and experience. However, these regimes can also impose costs. In particular, applying entry restrictions to professions, or setting professional standards too high, can limit supply and restrain competition, to the detriment of consumers.

Different approaches to occupational regulation lead to different trade-offs between regulating quality and promoting competition. Licensing regimes (which impose a legal requirement that a practitioner meets prescribed standards) can be more effective than registration regimes (in which practitioners must be registered but have to meet only basic requirements) in putting a floor under standards. However, licensees have an incentive to “capture” the licensing regime, to use it to restrict entry to the profession or trade.

The Government should consider the impacts on competition of arrangements for regulating providers of professional services. Where licensing is required to provide a minimum level of protection to users of a

professional service, the activity that requires licensing should be prescribed no more broadly than is needed to achieve that protection.

In some cases, occupational regulation regimes are set up in legislation. In such cases, the Government should be explicit in legislation about its expectations of those bodies, including entry and ongoing competency standards; their obligations to support a competitive market for the professional service; and to establish a well-functioning complaints resolution and reporting system. Legislation should also require that the governing boards of professional bodies include members who are knowledgeable about the interests of consumers.

Competition law could be improved

Competition laws and the institutions that implement them – competition agencies and the courts – are an important influence on how firms behave. Accordingly, they influence the intensity of competition and productivity performance in service industries. New Zealand’s small market size, remoteness and the characteristics of many services (such as low geographic tradability and high search and switching costs) mean that well-functioning competition law is particularly important in the services sector.

The Commission focused on three particular areas of competition law, rather than attempting to review the entire competition law framework. The areas were: preventing dominant firms from taking advantage of market power, pro-competitive collaboration, and market studies that deepen understanding of how industries, markets, or market practices are working.

Section 36 – taking advantage of market power

An important purpose of a competition regime is to prevent dominant firms from misusing their market power to damage the competitive process. Such damage may include improperly restricting the entry of new firms, and preventing other firms from engaging in the market or eliminating them.

Section 36 of the Commerce Act 1986 aims to deter and prevent dominant firms misusing their market power. It was drafted to be similar to the parallel section in Australian law, but New Zealand courts have diverged from Australian courts in interpreting it. New Zealand’s highest court has relied solely on a “counterfactual test”. Using this test, a firm is only judged to have taken advantage of market power if it can be argued that the firm would have behaved differently in a competitive market.

Monopolisation provisions (as they are termed) are tricky to get right and contentious in many countries. In New Zealand, those in favour of retaining the status quo suggest that changes to s 36 could create uncertainty for large firms and discourage them from innovation and other desirable competitive activities. However, other commentators consider that the counterfactual test is complicated to apply, suffers from conceptual problems, and can lead to wrong conclusions about whether firms are abusing their market power.

The Commission considers that s 36 should be reviewed, through a thorough legal and economic analysis that assesses reform options against the objectives of economic efficiency (particularly dynamic efficiency) and the long-term interests of consumers. The review should take into account the impact of small domestic markets, which may not be large enough to support firms that are big enough to exploit economies of scale, at the same time as maintaining sufficient competition and challenge to the market power of those firms.

Competition law should not stifle collaboration that improves productivity

Competition law should not prevent firms from collaborating to become more innovative and efficient. The Commerce (Cartels and Other Matters) Amendment Bill, currently progressing through Parliament, proposes significant changes that will redraw the permitted boundaries between competition and collaboration. Those responsible for collaborating to fix prices or quantities (cartel behaviour) will become subject to criminal sanctions. However, there is an exemption for certain collaborative activities along with a clearance regime for firms to check the lawfulness of proposals.

While it is difficult to predict how the Bill might affect competition and collaboration in the services sector, it runs the risk of discouraging productivity-enhancing collaboration. Industry peak bodies may be able to

help mitigate this risk by disseminating information about the Bill to their members, including information about the steps required to gain clearance for collaborative arrangements. The Bill's impact on the costs of doing business and undertaking innovation should be evaluated between two to four years after it comes into force.

Market studies can identify constraints on competition in specific markets

Competition authorities in many countries undertake broad-ranging inquiries into the state of competition in specific markets – commonly known as *market studies*. The Commerce Commission does not have the authority to do this, with the sole exception of studies into competition in telecommunications markets. While the Government has other instruments for inquiring into specific markets, the Commerce Commission has particular expertise that could be applied to this task.

The benefits of well-designed market studies are likely to outweigh their costs. Most importantly, market studies are a useful tool that may enable the Commerce Commission to develop a deeper understanding of the dynamics of specific markets and to identify a wider range of competition issues. There is value in granting the Commerce Commission powers to conduct market studies regarding competition in any market in the economy. The power to conduct market studies should be based on existing practice under s 9A (1) (b) of the Telecommunications Act 2001.

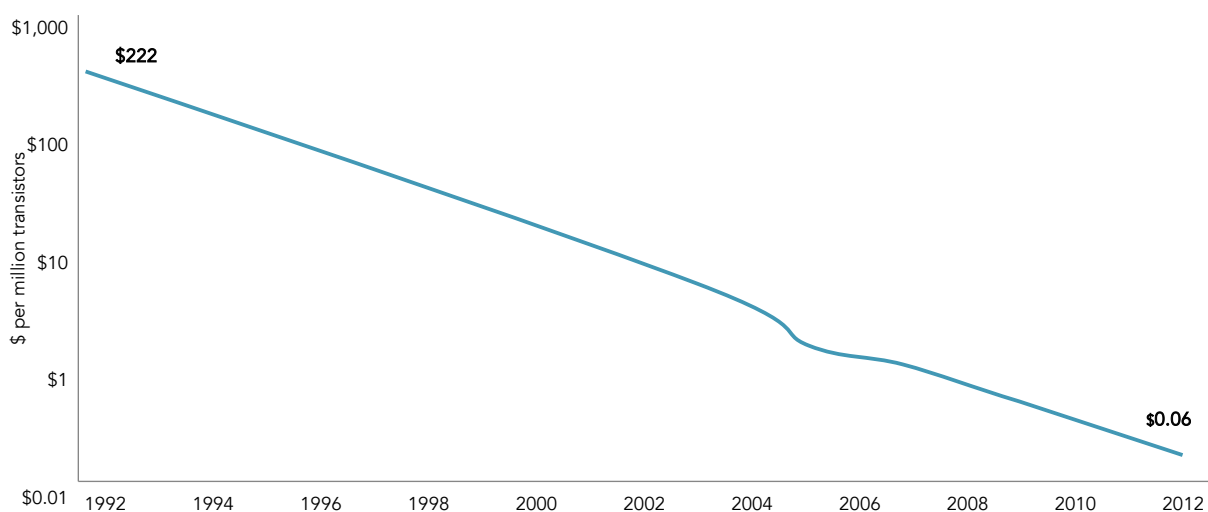
The contribution of ICT to productivity in the services sector

ICT underpins a “revolution” in services, which is transforming many existing services and creating new ones. Research has established strong links between ICT and productivity in the services sector, both overseas and in New Zealand. For example, more effective use of ICT in some service industries explains much of the superior productivity performance of the United States relative to European countries over the past two decades.

New Zealand data is broadly consistent with international evidence that industries that produce ICT, or are relatively intensive users of ICT, tend to show stronger productivity growth than less ICT-intensive industries.

The costs of producing ICT have fallen dramatically, while quality has improved significantly. This process continues, driven by technology advances that have seen the number of transistors that can be placed upon microchips approximately double every two years. These dramatic increases in computing power per dollar spent underpin ICT's strong current and potential future contribution to productivity, economic growth and wellbeing.

Figure 0.3 The falling costs of transistors (\$ per million), 1992–2012



Source: Chapter 8, Figure 8.2.

But the changes made possible by ICT are disruptive. The effects across the economy are pervasive and impact service industries in particular. Applying ICT often devalues existing assets while creating new

opportunities for profit. Existing assets whose value can be undermined by ICT include firms, business models, brands, and human and physical capital.

When assets lose value in their current use, market forces encourage their reallocation to more productive uses. But the process is seldom simple or easy. Moving assets to more productive uses is the single largest contributor to productivity growth. Adjustment costs – incurred in redeploying devalued assets – discourage reallocation. Policies aimed at reducing adjustment costs can contribute to productivity growth. Firms, industries and countries will be better off to the extent that they can adapt quickly – and at lower cost – to the opportunities that ICT creates and destroys.

As with other countries, New Zealand faces the issue of how best to make choices about policies and institutions that influence the way it responds to, and takes advantage of, the ICT revolution. These choices are best made in a thoughtful and informed way, to avoid the risks of an uncoordinated set of policies and institutions that work against each other and dissipate potential gains.

New Zealand's ICT investment is relatively lower and later

New Zealand creates a very small proportion of global ICT products. The main way it will benefit from ICT is from cleverly adopting and using ICT that is developed and produced overseas.

ICT investment per person in New Zealand – when adjusted for international ICT prices – has historically been lower than other advanced countries.

There are common patterns in how firms adopt new technology, including ICT. These patterns are driven by changes over time in prices, quality, risks, adoption costs and expected benefits. Individual firms adopt technology when it becomes available and when its anticipated benefits exceed expected costs. The best time to make a particular ICT investment will vary by technology and by firm.

For many important ICT investments, a significant part of the costs are fixed; that is, they vary little with the size of the investing firm or that firm's anticipated revenues. This favours larger firms, who can spread the fixed costs over a larger revenue base and are further favoured to the extent they can access lower-cost capital. New Zealand has few firms large enough to fully exploit those scale advantages.

New Zealand's service firms are more likely to have significantly invested in ICT during the past two years than those in the goods-producing or primary industries, according to survey results. The most commonly cited reasons for investing in ICT are to improve services or support new activities. The factors that discourage New Zealand service firms from investing in ICT include the overall financial case, limited capital, and, of lesser importance, limited information and limited access to skills.

Factors that affect ICT adoption and application

Firms' perceptions of the risks, costs and returns from ICT adoption are influenced by multiple factors including government policies and regulations.

The mostly intangible nature of ICT investment provides one reason why small and medium enterprises (SMEs) may find it difficult to get funds to invest in ICT. Software generally costs more than hardware and yet has little if any resale value. Software cannot serve as collateral and SMEs rely on investment capital. New Zealand lacks large firms and the investor market is small. Local investors are not able to develop depth in specialist fields in the way that, for example, investors in the United States have done.

People-management practices are particularly important for the managers of service firms investing in ICT. To make effective use of ICT, managers will often need to substantially reorganise and redesign business processes; promote and reward employees based on performance; and hire and retain top employees. Effective management of change also involves tracking what is going on inside the business, setting targets, monitoring outcomes and taking action to correct problems. While scant, evidence suggests that New Zealand management practices, particularly people-management practices, are weak.

ICT investments have better outcomes if a firm has ICT-savvy management and governance. Only a small proportion of New Zealand directors have an ICT background, though this is changing as a younger generation takes up positions.

Effective use of ICT also requires skilled ICT professionals. Shortages of these can delay ICT investments.

The two Southern Cross cables provide most of New Zealand's international data connectivity. Some concerns have been expressed about the capacity of these cables and the market power of their owner. The Commission is not aware of hard evidence to support these concerns, which should become less relevant if plans to build an additional cable between New Zealand and Australia come to fruition. This link would provide further competition on the trans-Tasman leg and into Asia, and indirect competition for data traffic to the United States.

Restrictive product market, labour market and land-use regulations can be a barrier to adopting ICT, because they make it difficult for human resources and physical capital to shift to more productive uses enabled by ICT. Regularly reviewing regulation to ensure that it does not unnecessarily restrain ICT adoption is worthwhile, particularly given other disadvantages that New Zealand faces in terms of market scale and less intense competition.

Increasing the productivity potential of ICT

Because ICT is a general-purpose technology, it is causing extensive and far-reaching changes in employment and skill requirements, and considerable reallocation of resources from old to new businesses. The policies and institutions that establish the framework of New Zealand's market economy need to support and encourage flexibility, adaptability and experimentation. The process of change will often be hard and uncomfortable, and will call for policy consideration of social, community and economic issues. Yet, with policies and institutions that support change rather than obstruct it, New Zealanders will have the opportunity to reap major gains from the ICT revolution, partly because it can reduce the effects of distance and a small domestic market.

Framework policies

Some government policies focus specifically on ICT. Framework policies apply more widely and also influence the adoption of ICT, for example by:

- increasing effective market size through trade openness and economic integration with other countries;
- regulating labour and capital markets and regulating land use, which can help or hinder the reallocation of economic resources to their most productive uses;
- funding and providing for education and training that builds human capital;
- facilitating the provision of infrastructure;
- increasing the intensity of competition;
- supporting business capability development, including improving access to good quality information; and
- supporting risk-taking and experimentation.

New Zealand has good policy settings relative to other countries in some of these areas. However, it faces challenges that many other countries do not, such as the economy's small size and remoteness from its markets. This means that it needs to have particularly good framework policies that address these challenges. For example, although New Zealand's labour market regulation is generally rated at the "flexible" end of the spectrum in international comparisons, the ICT revolution is likely to place a premium on such flexibility into the future, to make it easier for more innovative and productive firms to grow and the less productive to exit.

Three other policy initiatives would also help remove barriers to New Zealand firms adopting ICT.

- The Ministry of Business, Innovation and Employment, when next reviewing the KiwiSaver Act 2006 or within three years, should consider options for making it easier for KiwiSaver providers to invest in private equity and venture capital. This initiative should improve the supply of funding for investment in ICT-enabled innovation and business transformation.
- The Treasury, the State Services Commission and the Department of Prime Minister and Cabinet should ensure that the design of regulations that significantly affect the adoption of ICT by firms takes comprehensive account of costs and benefits. This initiative would help to avoid unintended regulatory costs to ICT adoption.
- When procuring ICT, the Government should purchase non-exclusive rights for the use of intellectual property (IP), rather than exclusive or ownership rights.. This would encourage lower prices for the government and the productive re-use of that IP by suppliers.

Improving ICT skills

There is a global shortage of ICT professionals. Global demand for ICT professionals has continued to rise since the 1970s. This pattern is likely to continue, given the falling cost of ICT and its increasing use.

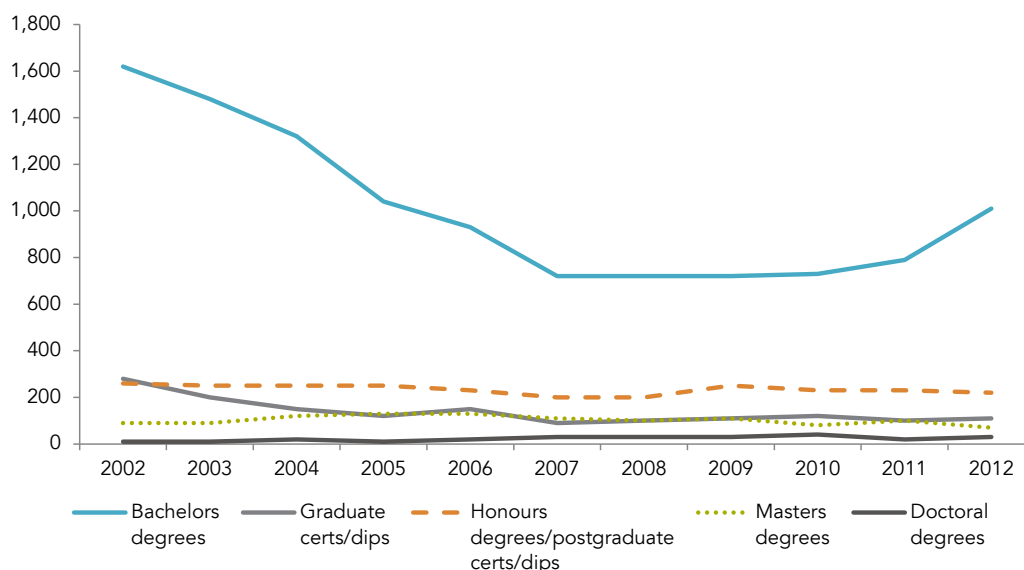
The dotcom bust in 2000 saw a rapid fall in the number of students graduating in New Zealand with IT qualifications (Figure 0.4). Lower numbers of IT graduates continued through the 2000s, at the same time as the number of jobs and people in ICT continued to rise.

Skill shortages can lead to low investment in new ICT and less effective use of installed ICT. Firms will not invest in new technology if they expect that employees with the required skills will not be available. This expectation can be self-fulfilling because prospective employees will not invest in skills if they expect firms will not invest in technology.

New Zealand employers compete in an international market for ICT skills. Net migration of ICT graduates is an important contributor to balancing supply and demand. New Zealand’s immigration policy appears to be working reasonably well in making it easy for skilled migrants to fill ICT vacancies. Changes to New Zealand’s tax laws would allow more efficient temporary transfers of employees into New Zealand to meet fluctuations in demand for specific ICT skills.

ICT is developing extremely rapidly and firms, rather than academic institutions, are driving ICT innovation. Unless these institutions have close links with business, it will be hard for ICT academics to keep pace with innovation. Poor linkages between the education and business sectors make it difficult for tertiary education providers to prepare students for careers in ICT.

Figure 0.4 Trends in IT degree completions by New Zealand domestic students, 2002–2012



Source: Chapter 10, Figure 10.2.

Current funding arrangements for tertiary education providers do not provide strong incentives to establish and maintain links with firms. Student choices are the main drivers of funding for particular programmes and providers.

Recently the Ministry of Education started publishing information on graduate employment and earnings outcomes by field of study, but not by education provider. If prospective students had better information about the employment and earnings outcomes of graduates with qualifications gained from *particular providers*, this would sharpen incentives for tertiary education providers to tailor their programmes to industry needs.

Few ICT students gain significant business knowledge during their studies, and computer science qualifications tend to focus on developing technical expertise within a scientific paradigm. Adding to this are course requirements and timetabling issues that sometimes make it hard for students to do a joint degree in computer science and business.

Tertiary providers often let graduates in one discipline undertake 1-year programmes in a second discipline. Computer science graduates could be encouraged to undertake a 1-year programme in business studies. This would better prepare them for work in firms where ICT is closely integrated into business strategy.

Larger firms that use and produce ICT often offer internships for students and induction programmes for graduates. By contrast, smaller firms have fewer resources to offer such programmes. More collaboration among small firms and tertiary education providers could improve the supply of “work-ready” ICT graduates. Industry-led initiatives could encourage the development of collaborative arrangements, including internships for ICT students in small firms. The Tertiary Education Commission and the Ministry of Business, Innovation and Employment should work with industry associations, ICT firms and education providers to help develop such initiatives.

Cloud computing is changing ICT service delivery

There is no single definition of cloud computing. It encapsulates many ideas, including that ownership of data can be separated from its physical location and direct control; data should be stored and processed where it is cheapest; services are best rented on an as-needed basis; and access to data should be seamless across devices and locations.

The shift involved from in-house to cloud computing – from the immediate physical control of data to control via contract – is as much psychological as technological. Overcoming barriers to the adoption of cloud computing typically involves designing contracts and institutions to minimise and best allocate risk, and building trust in those contracts and institutions.

The trend towards cloud computing is driven by: huge economies of scale and scope in the centralised storage and processing of data; falling data transport costs; near global internet connectivity; and consumers placing a significant premium on mobility and the use of multiple devices. These trends have reshaped the ICT world during the past decade and show no signs of abating in the near future. The effect of scale shows in the much lower prices that United States cloud providers offer consumers compared to New Zealand providers.

Cloud computing offers significant benefits

Cost reductions and the new and enhanced capabilities of cloud computing potentially benefit all ICT users. Many cloud-based products and services are “scalable”, in the sense that purchasers can buy exactly (or very nearly) the quantity they need and vary that quantity over time. This is particularly beneficial to firms that are small and/or variable users of ICT.

Cloud computing gives firms more choice of ICT inputs. This increases their chances of finding a service closely matched to their particular needs. Also, by increasing the number of close substitutes, cloud computing helps to improve competition and drive down ICT prices.

The ability to rent cloud services in other countries enables New Zealand firms that export digital services to have similar ICT costs to competitors based in those countries. This “levelled playing field” offers an overall

cost advantage to New Zealand firms if other costs (such as labour) are lower than those of their competitors.

Adoption of cloud computing in New Zealand

Sixty percent of New Zealand businesses surveyed reported that they use, or intend to use in the near future, at least one type of cloud computing application. Consumer-oriented cloud applications are most commonly used, followed by business-oriented cloud applications. The services sector makes more use of cloud computing than do the primary and goods-producing sectors.

Government agencies have been strong adopters of New Zealand-located cloud services. Yet, by favouring domestic cloud services, which are significantly more expensive than similar overseas services, the Government has missed opportunities for cost savings and technology demonstrations. The Government should address any data sovereignty, security and privacy risks associated with offshore cloud computing through international negotiations, with Australia in the first instance.

Government advice to its agencies on cloud computing is unduly risk-focused. The Government should review how well it is communicating its cloud computing policies and guidance, and seek to provide balanced advice and constructive support to its agencies.

Regulatory barriers to adopting cloud computing

The important role of ICT and its rapid rate of change create regulatory challenges. Cloud computing further complicates these challenges, as it undermines assumptions about who owns data, and about the location of its production, transport routes, storage and consumption.

In particular, cloud computing has made questions about data location harder to answer. In a real sense, data in the cloud is stored “everywhere and nowhere”. Flexibility over where data is stored and processed allows cloud computing service providers to be more efficient, and ultimately to provide services at lower prices for their customers. Restrictions on where data is stored or the free flow of data between countries may be costly for those affected. They will have a disproportionately negative effect on smaller countries such as New Zealand, which lack the scale to support a wide range of sophisticated, home-grown, digital services.

The Government should pursue free-trade-in-data agreements with other countries. A reasonable aim of such agreements should be that the rights and responsibilities of data owners do not vary with the physical location of their data. Bilateral negotiations with Australia could be resolved quickly, so should be pursued as a first step. Resolving such issues will help New Zealand firms adopt cloud computing.

The widespread adoption of cloud computing creates challenges for taxation, as concepts of country of origin and country of consumption become blurred, and services provided across national borders are difficult to monitor. New Zealand should promote – and participate in – international forums with the aim of reducing the ability of multi-national firms that provide digital services to shift their profits to reduce the tax they pay.

Five themes for boosting productivity

The actions of firms and individuals will drive productivity improvements in New Zealand’s services sector. However, they will be more likely to succeed where the Government provides a supportive policy environment.

Services-sector policy should not be considered in isolation. Service firms share inputs – including labour, capital and land – with other firms in the economy. And the outputs of service firms are largely consumed by other firms. Many of the policies that can make a difference to services-sector productivity relate to these input and output markets, and will likely also have effects on the productivity of firms in the other sectors.

Reflecting on its work for this inquiry, the Commission perceived five themes at the heart of boosting productivity in the services sector. The Government should keep these themes in mind in all relevant policy making in order to maximise services-sector productivity.

First, *internationalisation* expands markets, stimulates competition and transfers knowledge. Lowering barriers faced by foreign service providers to New Zealand markets will help boost competition and transfer knowledge to local firms. Reducing the cost of access to international markets will help New Zealand firms achieve the benefits of scale. Internationalisation requires policy attention to the free flow of goods, services, capital, labour, data, ideas and technologies.

Second, success requires *new skills* and the *flexibility* to adjust. Adoption and effective use of ICT is very important to boost productivity in service firms. Getting the most out of ICT involves complementary investments, including business reorganisation, staff training and technical and management skills. The regulatory environment needs to facilitate rather than impede change. Other regulatory objectives need to be balanced so that sufficient weight is given to impacts on ICT adoption and productivity growth. Should the labour market changes from the ICT revolution prove to be as disruptive as many commentators are predicting, New Zealand and other countries will need to make major modifications to labour market institutions. To be successful, institutions will need to both facilitate change and support people through it.

Third, *experimentation* fosters innovation. Trying many approaches, while retaining the flexibility to quickly back out of unsuccessful ones, is the likely path to success in an uncertain and disruptive environment. Policy needs to allow firms the flexibility to adjust to emerging technology possibilities. Policy that is overly prescriptive about business models or market boundaries, or imposes high exit costs on firms, can discourage innovation.

Fourth, *quality regulation and institutions* underpin well-functioning, efficient markets. Many service markets are highly regulated. The Commission's inquiry into regulatory institutions and practices, undertaken in parallel with this inquiry, identifies many ways to improve regulation. Government needs to ensure that the public institutions, such as competition law, that underpin market competition and market transactions are of high quality. It needs to keep seeking improvements rather than adopting a set-and-forget approach. Government also needs to be quick on its feet in understanding and adjusting to emerging technologies and business innovations.

Fifth, *Government is an important player*. As well as through regulation, the Government interacts with the market services sector through taxation and spending. It is a significant provider of services and infrastructure, and its procurement policy influences markets. Government-provided services were excluded from the terms of reference for this inquiry. However, these services are growing, and the scope for productivity improvement is large. New methods of supply, including through the use of ICT, are likely to be very relevant to improving wider services-sector efficiency.

The Commission expects that the recommendations in this report, if implemented effectively, will make a significant contribution to lifting the sector's productivity. Reflecting the sector's national significance, Cabinet should monitor progress toward implementing accepted recommendations, to ensure that they make the largest possible contribution to improving the productivity of this important part of New Zealand's economy.

The interest in this inquiry and the significant contributions from business, the Council of Trade Unions, education institutions and government agencies is testimony to the national significance of the services sector. The sector is dynamic and operating in a rapidly changing environment. The Commission hopes that this inquiry will stimulate an ongoing national conversation about further ways to improve productivity in the sector.

1 About this inquiry

Key points

- The Government asked the Commission to conduct an inquiry into boosting productivity in the services sector.
- The inquiry's 1st interim report – released in July 2013 – addressed Part A of the inquiry's terms of reference. It explored the performance of the services sector and the sector's role in the wider economy.
- Part B of the terms of reference required an in-depth analysis of selected topics, to identify specific opportunities to boost productivity in the services sector and contribute to New Zealand's overall productivity.
- The Commission released a 2nd interim report in January 2014 examining two topics:
 - stimulating competition in New Zealand service markets; and
 - the successful application of information and communications technology (ICT) by New Zealand service firms.
- This final report draws together the core insights and findings from the 1st and 2nd interim reports. It also presents the final recommendations relating to competition and ICT.

1.1 What was the Commission asked to do?

The Government asked the Commission to conduct an inquiry into boosting productivity in the services sector. The two main aims of the inquiry were:

- to build a better understanding of the services sector, its recent performance, and the role it plays in the New Zealand economy (Part A); and
- to identify opportunities to boost the productivity of service industries and to contribute to New Zealand's overall productivity (Part B).

The inquiry released its 1st interim report in July 2013 (NZPC, 2013a). That report addressed the first aim by assessing the role and performance of the New Zealand services sector. It considered the productivity performance of different service industries, how the services sector affects the economy as a whole, and how its performance compares with other countries.

1.2 Why does the productivity performance of the sector matter?

The productivity performance of the services sector matters for New Zealand. It matters because the sector is such a large proportion of the total economy.

The performance of the services sector directly impacts the wellbeing of New Zealand households. For example, an unnecessary barrier to productivity growth in telecommunications services could negatively affect the price and quality of communication. This would impair the ability of New Zealanders to connect with their families, communities, schools, hospitals and social networks.

The services sector is closely intertwined with other sectors of the New Zealand economy. Many service industries provide important inputs into the production processes of other industries. The performance of these service industries has a pronounced impact on the cost structures faced by firms that rely on their outputs.

1.3 What are market-provided services?

The terms of reference specifically directed the Commission to limit its consideration to “market-provided services and therefore exclude study of services provided directly by the public sector”.

Several inquiry participants commented on the scope of this inquiry (Box 1.1).

Box 1.1 Participant comments on inquiry scope

Many participants emphasised the importance of non-market provided services. For example:

The public sector is a large ‘chunk’ of the service sector and excluding services provided by the public sector from the scope of the Inquiry is in the Federation’s view unfortunate and misses an opportunity to learn from experiences (in both directions). (Federated Farmers, sub. 5, p. 3)

Much of our international trade occurs with the involvement of public sector entities. Universities, Polytechnics and Schools are all engaged in international trade. MetService, Airways Corporation and Learning Media are examples of state owned entities that trade internationally. There is no reason why our hospitals could not be as active in international trade as our universities. It is our belief that international education is the second largest service export industry, taking \$2.7 billion in foreign exchange in 2011. (BusinessNZ, sub. 9, p. 5)

Some participants suggested that this inquiry should cover all service industries, or at least the market-provided parts of all service industries. The New Zealand Home Health Association pointed out:

... considering... that 67% of health services are provided by agencies outside of government (including private and not for profit agencies), to not include them would exclude a significant, and growing proportion of service delivery. (sub. 4, p. 2)

Alistair Sheat encouraged the Commission to take an expansive view:

...international research on services and service innovation is increasingly talking about the need to take a ‘service systems’ approach that recognises value is created (or destroyed) via the interaction of parts of the service system ... health, education, scientific and technical services, and social sectors are highly interconnected and inter-dependant so considering just one part of the ‘service system’ limits potential for value creation. (sub. 16, pp. 13–14)

On the other hand, the New Zealand Council of Trade Unions supported the exclusion of the public sector from this inquiry’s scope, noting the “measurement of productivity among services is frequently problematic, and particularly so in the areas dominated by the public sector” (sub. 12, p. 3).

There is a significant proportion of non-market provision in some service industries, such as education and training (see Table 1.1). The productivity performance of these industries has an important impact on New Zealand’s economy. Ultimately, the Commission largely excluded non-market services from its analysis, reflecting the terms of reference.

National statistics distinguish between market and non-market provision based on whether output is intended for sale at economically-significant prices² (United Nations Statistics Division, 2009). Provision is distinct from issues of ownership and funding. For example, the output of state-owned enterprises is classified as “market-provided” if they sell their output at economically-significant prices to generate a profit. Likewise, a government-funded surgical operation in a privately owned and operated hospital is market provision, as the operation was sold to the Government at economically-significant prices.

² Prices are “economically significant” when they have a significant influence on the amounts that producers are willing to supply and on the amounts purchasers wish to buy (United Nations Statistics Division, 2009).

Table 1.1 shows the service industries with notable levels of non-market provision.

Table 1.1 Non-market provision in service industries, 2010

Service industry ¹	Non-market provision
Public administration and safety	94%
Education and training	87%
Health care and social assistance	57%
Arts and recreation; Other services ²	28%
Transport, postal and warehousing	9%
Owner-occupied property operation	NA ³

Source: Statistics New Zealand GDP tables.

Notes:

1. This table excludes service industries with non-market provision below 9%.
2. Data for these two industries are combined in the source tables.
3. Not applicable as the output is not sold.

High levels of non-market provision mean that the public administration and safety industry is out of scope.

The transport, postal and warehousing, arts and recreation, and other service industries are treated as market-provided in most analysis in this report, despite small shares of non-market provision.

Owner-occupied property operation reflects the value obtained by owners from living in their properties. It is an important component (6.2%) of GDP. However, official productivity measures do not exist because it is impractical to measure labour input. Accordingly, the Commission excluded this industry from the inquiry.

The market-provided parts of the education and training and health care and social assistance industries are technically in scope, but are difficult to isolate and examine. Statistics New Zealand (2013a) provides productivity statistics for these industries as a whole – but not disaggregated into market and non-market provision.³ The productivity of the market-provided parts of these industries may be considerably different to that of the industries as a whole; however, the Commission was not in a position to determine whether or not that is the case. Accordingly, in most cases the Commission excluded these industries from its analysis.

1.4 Two in-depth topics in services-sector productivity

The inquiry's terms of reference required the Commission to carry out a detailed analysis on a selection of issues that are critical for boosting productivity in the services sector.

The inquiry's 1st interim report proposed to examine two of the following three candidate topics:

- How to improve occupational licensing in the services sector: Is there an appropriate balance between the costs and benefits that stem from occupational licensing regimes in the services sector?
- How to stimulate services competition: Is there a role for government in stimulating consumers to drive greater competition in New Zealand service markets?
- How to reduce barriers to successfully applying information and communications technology (ICT): Are there policy changes that can improve the effectiveness of ICT adoption by New Zealand service firms?

³ A further issue is that the productivity measures for education and training and health care and social assistance are not directly comparable with those for other industries (Statistics New Zealand, 2013a).

The Commission chose the last two topics after considering feedback and submissions from inquiry participants (Box 1.2).

Box 1.2 Some views from submitters on topics for in-depth analysis

Submissions on the 1st interim report included support for all three candidate topics.

MYOB believes the inclusion of ‘addressing barriers to the successful application of ICTs to service industries’ as one of the research topics focused on during the second phase of the inquiry is critical to ensuring local business operators benefit from the growth and development of a wide range of technology. (MYOB, sub. 102, p. 5)

We believe the topic Stimulating Services Competition would rank most highly in relation to the selection criteria identified. This topic has the greatest potential to impact on New Zealand’s overall productivity performance and lead to concrete recommendations for change to government policy. (Insurance Council, sub. 111, p. 1)

For this inquiry the first two (improved occupational licensing, stimulating services competition) rank higher in my opinion than the third (barriers to ICT). (Donal Curtin, sub. 108, p. 1)

...the Commission should investigate the application of ICTs by New Zealand businesses more fully. We think this should involve a more detailed look at adoption of advanced ICT applications, such as online ordering and payment via websites, rather than uptake of basic technologies such as internet access and email. (Sapere & Covec, sub. 105, p. 1)

In terms of credible evidence to support a policy initiative the highest priority topic for a future focus is the role of ICT in improving services productivity. (Alistair Sheat, sub. 109, p. 2)

The ICT topic received the most support from submitters. Support was roughly evenly split between the competition and occupational regulation topics.

Four submissions on the 2nd interim report (NZPC, 2014a) reiterated the importance of competition and ICT to productivity growth in New Zealand:

Effective competition is essential to the successful functioning of New Zealand’s business environment. Real world competition is a complex phenomenon, and can be highly context specific. It is important that competition policy recognises and addresses these complexities if it is to successfully promote efficient business practices and a more productive economy. (Insurance Australia Group, sub. 204, p. 3)

We welcome the focus on ICT and how increased use of technology can help our services sector improve their competitiveness through intelligent adoption of technology. We also point out that the technological landscape is fast changing and that adoption needs to be light, lean and agile. (NZRIse, sub. 209, p. 1)

2degrees is a strong advocate of the benefits of competition and ICT and supports the Productivity Commission’s focus on stimulating competition in services to drive productivity gains. (2degrees, sub. 217, p. 1)

We support the Commission’s focus on productivity improvements that can be achieved through use of ICT. As set out in the first report, adoption of ICT in New Zealand can deliver significant opportunities for growth. (Telecom, sub. 218, p. 3)

The Commission decided not to proceed with the other topic – improving occupational licensing in the services sector (although occupational licensing is examined in the context of competition in Chapter 6). Scope exists to lift productivity through improvements to New Zealand’s occupational licensing system; however the size and complexity of this topic make it better suited to a dedicated inquiry. BusinessNZ and Foodstuffs NZ recommended occupational licensing as a future inquiry topic for the Commission (subs. 203, 212).

1.5 Building the evidence base

The Commission's findings and recommendations were informed by a comprehensive engagement process. This began with the release of an issues paper, which attracted 16 submissions. The two interim reports attracted a further 40 submissions.

Information from the submissions was supplemented by numerous engagement meetings, a webinar, an experts' roundtable and an ICT reference panel.

The Commission also conducted a survey of New Zealand businesses on their ICT investments and purchases of services (Box 1.3).

Box 1.3 The Commission's 2013 business survey

Colmar Brunton (2013) conducted a survey of New Zealand businesses on behalf of the Commission. The survey aimed to gain further insights into business' ICT investments and purchases of services. The survey was completed by 1 526 senior decision makers in New Zealand businesses between 15 October and 7 November 2013.

The sample was sourced from Colmar Brunton's dedicated online panel of businesses. The survey excluded responses from sole traders to avoid numerous very small businesses distorting the results. Responses from people working in the public administration and safety industries were excluded because the inquiry is limited to market-provided services. To allow more robust analysis of larger businesses, smaller businesses (1-5 employees) were under-selected and larger businesses were over-selected. The results presented in this report use weighted data to reflect New Zealand business demographics. Colmar Brunton's research report is available from www.productivity.govt.nz.

1.6 A guide to this report

Table 1.2 outlines the structure of this report. The chapters can be read in any order. Chapters 2–4 examine the role of services in the New Zealand economy. These chapters draw on the 1st interim report. Chapters 5–7 examine the role of competition in the services sector and include recommendations to strengthen competition. Chapters 8–11 examine ICT as an important driver of productivity growth in the services sector and contain recommendations to increase the rate and effectiveness of ICT adoption by New Zealand firms. Chapter 12 draws together the most important insights and recommendations from the inquiry.

Table 1.2 Report structure

Chapter content
Chapter 2 provides an introduction to the services sector. It discusses what distinguishes services from goods, and the factors that motivate government regulation of service industries.
Chapter 3 examines the productivity performance of the services sector over time and relative to other countries.
Chapter 4 examines the role of the services sector in the New Zealand economy. It examines the links between the services sector and other parts of the New Zealand economy, the direct and indirect contribution of services to New Zealand's exports, and the extent to which employment shifts into the services sector have affected productivity performance.
Chapter 5 introduces the first in-depth topic – stimulating services competition – and discusses the links between productivity and intensity of competition.
Chapter 6 considers how search and switching costs can negatively affect service markets, and considers opportunities to reduce them.
Chapter 7 covers the role of competition law in competition policy, and discusses specific opportunities to improve competition law, including unilateral conduct (Section 36 of the Commerce Act 1986), market inquiries and productivity-enhancing collaboration.

Chapter content

Chapter 8 introduces the second in-depth topic – addressing barriers to the successful application of ICT. It explains how ICT is revolutionising service industries and boosting their productivity.

Chapter 9 covers ICT adoption by firms and the business and policy influences on their adoption decisions. It considers the “framework” policies and institutions to take best advantage of the ICT revolution.

Chapter 10 covers ICT technical skills and ICT-savvy managers (an important complement to adopting ICT), and investigates the supply and demand of ICT skills.

Chapter 11 considers how cloud computing is changing how ICT services are delivered globally, and examines the drivers of cloud computing, its potential benefits and barriers to adopting it in New Zealand.

Chapter 12 provides an overall assessment of the services sector and pulls together the most important insights from the inquiry.

2 Understanding services

Key points

- The services sector is broadly defined for national statistical purposes as the remainder of the economy after the primary and goods-producing sectors have been accounted for. This definition of the sector and of the industries within it facilitates international comparisons and the tracking of broad trends over time. Generalisation is valuable in framing thinking about the sector and its role in the economy. Understanding the broad patterns draws attention to features of services that deserve more in-depth analysis.
- Productivity – the standard measure of production efficiency – is hard to measure for many service industries. The analysis in this report draws on the best data available.
- Service transactions commonly involve higher transaction costs than goods transactions for reasons including that the contracts, explicit or implicit, tend to be more complex. Reductions in transaction costs can increase both the number of transactions and the economic benefits created by those transactions.
- Spatial transaction costs are the extra costs incurred because production and customers are not co-located. Spatial transaction costs for some services (eg, those involving travel by the provider or customer) are higher than those typically associated with goods. Legal and regulatory differences between countries can impact strongly on services, exacerbating these costs. High spatial transaction costs can lead to localised domestic markets. Such markets may involve a trade-off between scale in production and competitive pressure.
- Information asymmetries – when sellers and buyers have different information – can be more pronounced in service transactions. Problems arise due to difficulties in assessing service quality before or after purchase, and in obtaining remedies for poor service quality.
- The services sector is highly interlinked with the other sectors of the economy. Physical “goods” embody many services, and likewise intangible “services” require goods in their production. Policy analysis should avoid the trap of treating the primary, goods-producing and services sectors as silos.

This chapter introduces an economic framework for understanding services. The framework reflects the differences between services and goods, and helps to identify issues that need additional attention when considering services.

Sections 2.1 to 2.4 introduce the Commission’s framework for understanding services, the services sector and its productivity. Sections 2.5 and 2.6 explain how the complexity of many service transactions poses problems for regulators and constrains opportunities for international trade. Section 2.7 outlines the main themes that the Commission covers in this report.

2.1 What are services?

Most people have an intuitive feel for the difference between a “good” and a “service”. A lump of coal is clearly a good and a haircut a service. However, in practice it is difficult to find a definition that deals satisfactorily with the many things that have attributes of both (Box 2.1).

Box 2.1 Takeaway coffee – a good or a service?

Making the distinction between a good and a service can be complex – even for an apparently simple product such as takeaway coffee. Is the customer paying for the coffee (a good) or the application of the barista's skills (a service)? The two perspectives introduced later in this chapter reflect these differing views:

- The *production perspective* classifies takeaway coffee as a service, as it is an output of the accommodation and food services industry.⁴
- The *transaction perspective* classifies the sale of a takeaway coffee as a goods transaction, as the cup and its contents change ownership at the point of sale.

The Commission found no single right or best definition of a service. Yet services are an important topic in the economic research agendas of governments and other organisations. International thinking approaches the topic from different viewpoints (Box 2.2).

Box 2.2 International thinking about services

Governments, international organisations, businesses and academics all have an interest in services. The approach they take to understand services depends on the somewhat different problems that they seek to address.

Governments often seek policies to enhance the sector's contribution to the economy. For example, the Irish services strategy identified services "as the most likely avenue to sustainable growth" (Forfas, 2008, p. 1). It recommended policies to increase the diversification of Ireland's services exports away from over-reliance on ICT and financial services; increase internationalisation of Irish services enterprises; and improve the productivity of locally traded services (Services Strategy Group, 2008). The OECD's report on enhancing the performance of the services sector recommended regulatory reform of service markets, more open international trade and investment in services, and policies to support services innovation (OECD, 2005).

Much academic research has explored the causes and effects of structural change that has led to the services sector having an increasing share of the economy. For example, Acemoglu (2009) considered the demand and supply-side factors influencing structural change in the composition of the economy. On the demand side, as households get richer, the proportion of income spent on goods goes down, while the proportion spent on services goes up. On the supply side, differences in the productivity growth of different industries lead to changes in relative prices, and so to structural change (Baumol, 1967; Acemoglu & Guerrieri, 2008).

International services trade is a growing area of research. Francois and Hoekman (2010) surveyed the literature and found increasing evidence that services liberalisation (for instance, reducing barriers to foreign direct investment (FDI) in services) significantly improves economic performance. Gains include improved productivity in manufacturing industries that use services as inputs, and better coordination of activities between and within firms. Another report noted the neglect of services in international trade policy. Reasons include low public awareness of the contribution of services to the economy; government concern about the impacts of openness in services on regulatory systems; and the fragmented approach to negotiating trade agreements (Pacific Economic Cooperation Council & Asian Development Bank Institute, 2011).

Businesses have a strong interest in understanding services. An extensive marketing and management

⁴ Because firms are classified by their main activity, this would not always be the case. For example, a takeaway coffee from a bookstore would likely be an output of the retail industry.

literature has examined ways for businesses to succeed in service industries. A recent review identified a substantial body of research on service innovation over the last 20 years. Many services can now be traded from afar, leading to debate about service offshoring (Bryson, Rubalcaba & Ström, 2012).

Multiple perspectives on services

The Commission found adopting two alternative but complementary approaches – or perspectives – to be the best way to develop and present a rich picture of the sector, its role in the economy and opportunities for improvement. Each is based on a different way of thinking about services, offers different opportunities for analysis, and leads to different insights.

- The *production perspective* (section 2.2) groups firms into three *sectors* – primary, goods-producing and services – based on the nature of their productive activities. The production perspective is based on how services are produced and reflects how they are treated in national accounts by statistical agencies.
- The *transaction perspective* (section 2.3) delineates *goods transactions* – those involving a change of ownership of a tangible product – from *service transactions* – those involving renting, intangibles or both. Intangible refers to something that does not have a physical presence. From this perspective, *services* are the subject of service transactions.

Applying these two perspectives to even a simple service such as takeaway coffee is not straightforward, indicating that a pragmatic approach is needed to deciding when to use them (Box 2.1). The *production perspective* makes it easy to apply readily available data in standard form to understand the broad role of services in the economy. The *transaction perspective* draws attention to special characteristics of service transactions that affect the operation of markets.

The Commission also found it useful to explore the relationship between goods and services. In practice each is an important input into the production of the other (section 2.4). Goods exports embody a large proportion by value of services (Chapter 4). Goods and services are often bundled together at the point of sale.

What is the services sector?

This report adopts the production perspective to define service industries and so the sector. This choice is based on the need to use standard statistical data to investigate productivity performance, to make international comparisons, and to draw on existing research literature.

Service industries are those that are neither *primary industries* (ie, mining, agriculture, fishing and forestry) nor *goods-producing industries* (ie, manufacturing, construction, electricity, gas, water and waste). The service industries collectively form the *services sector*.

The service industries and their contribution to New Zealand's GDP are shown in Figure 2.1. These classifications are based on the *Australia New Zealand Standard Industry Classifications 2006* (ANZSIC06) used by Statistics New Zealand. The industries outlined in black are the focus of this inquiry.

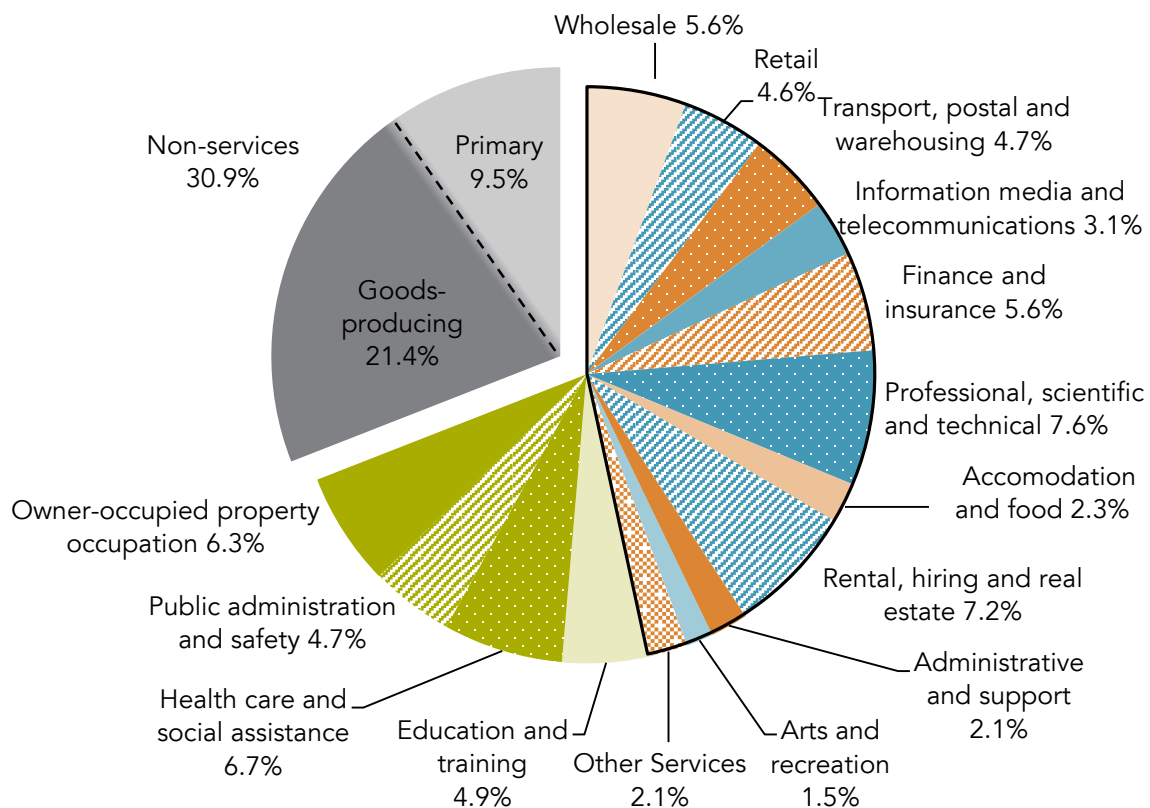
Much of the data of interest for this inquiry is based on sources that do not use the ANZSIC06 classifications. Where required, this report analyses and presents the data using the classification system of their sources. Appendix D outlines these classification systems and the degree to which they correspond.

There is ongoing debate in many countries about which industries make up the services sector (Schettkat & Yocarini, 2003). The ANZSIC06 classification system itself contains some apparent anomalies. For example, "agriculture, forestry and fishing support services" are classified as primary sector production (Federated Farmers, sub. 5). Likewise, "water and waste services" are classified in the goods-producing sector.

Reflecting the unclear distinctions between goods and services, Federated Farmers (sub. 5) requested that the electricity, gas, water and waste industries be included within the scope of this inquiry, as these

industries provide important inputs into agricultural production. The same point might be made for inputs particularly important to other industries.

Figure 2.1 ANZSIC06 industries (% of New Zealand's GDP), 2011



Source: Productivity Commission; Statistics New Zealand national accounts tables.

Notes:

1. Industry outputs and GDP are measured in 2011 dollars.
2. The share of service industries is around 70% – the total share of services in the economy.
3. Owner-occupied property operation is an estimate of the “housing services” produced by owner-occupied residential properties.

On balance, the Commission saw benefits from alignment with international classification systems that facilitates international comparisons, and did not expand the scope of the sector for this inquiry.

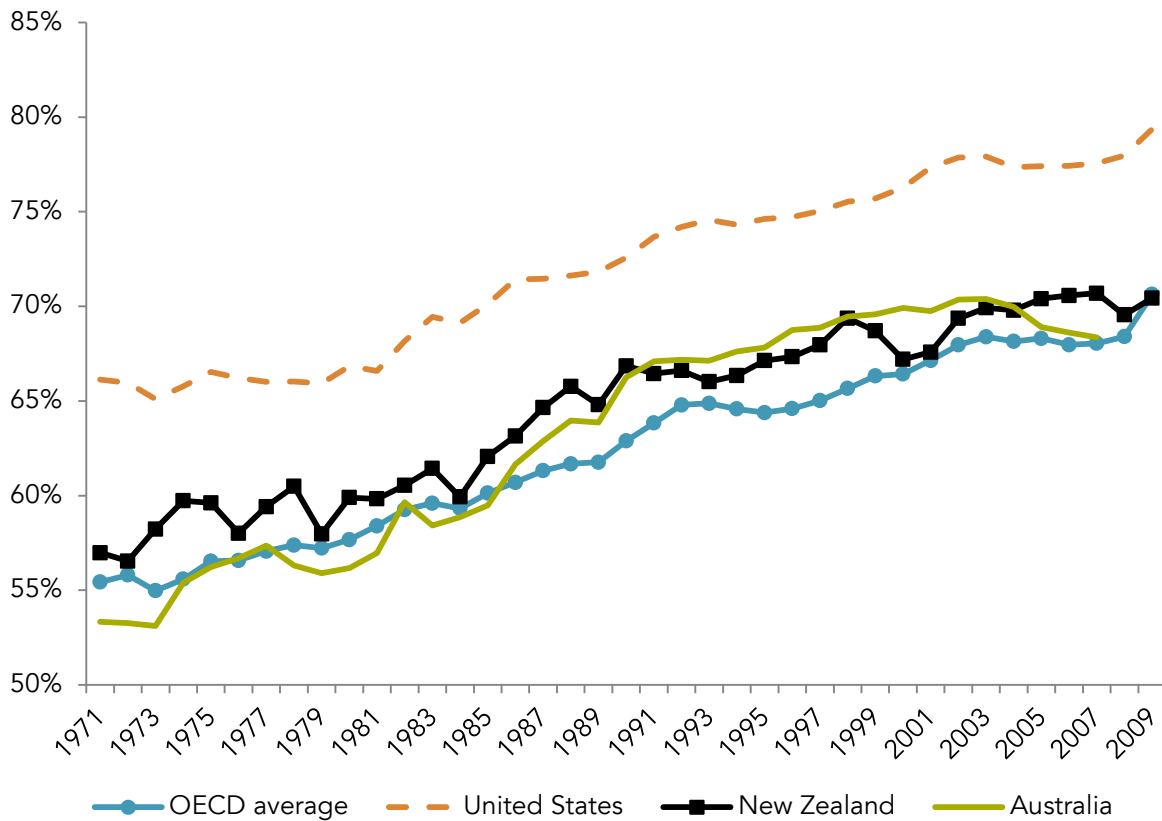
Most of the analysis presented in this report is based on broad industry classifications. This allows a summary view of differences across industries and internationally.

Understanding the drivers of productivity growth and the effects of government interventions requires more detailed analyses, using more disaggregated data. Such analysis usually involves a trade-off between breadth and depth. This inquiry drew on findings from a wide range of both international and New Zealand research that uses disaggregated data.

The services sector is growing in New Zealand and other developed countries

The primary, goods-producing and services sectors make up the New Zealand economy. They are highly integrated; each sector is a significant source of inputs for the other two.

New Zealand's services sector has grown strongly, as in other OECD countries (Figure 2.2). The sector now produces about 70% of gross domestic product (GDP) and accounts for more than 75% of employment.

Figure 2.2 Services sector share of GDP compared internationally, 1971–2009

Source: Productivity Commission; OECD structural analysis database; Statistics New Zealand.

Notes:

1. The OECD data for New Zealand covers 1971 to 2006. Subsequent data points are based on Statistics New Zealand growth rates.

Service industries provide a wide array of services to firms and private individuals across the economy. This inquiry covers market-provided services (Chapter 1), collectively representing about half of GDP.

Some industries within the services sector are well researched. However, analysis of the sector as a whole is relatively scarce in comparison with the primary and goods-producing sectors. This scarcity was one of the motivations for this inquiry.

2.2 The production perspective

The production perspective enables service industries to be grouped according to their production processes. It also facilitates broad analysis of productivity using readily available data in national statistical collections.

Grouping service industries

Service industries are diverse (McLachlan, Clark & Monday, 2002). Diversity arises from many sources and is apparent across and within industries (Appendix F). For example, service industries differ in the predominant form of capital they require (Box 2.3) and the intensity of their use of ICT.

Box 2.3 One dimension of service industry diversity: what type of capital is required?

Some services take the form of renting physical goods. Rental can be on an exclusive basis (eg, car hire, holiday houses). In other cases the service offered is access to shared infrastructure that would be infeasible to supply on an exclusive basis (eg, an airport or mobile phone network). The firms that supply such services are capital intensive, particularly in physical capital.

Other service industries are intensive in their use of human capital. For example, doctors, lawyers and

building inspectors hire their expertise and apply it to a customer's specific situation. Physical capital is generally less important for firms in these industries.

A third category of service industry relies on intangible capital; for example the rights to reproduce music, films or photographs.

It is useful to group service industries to provide insights. This report groups the ANZSIC service industries according to the production process (Table 2.1): distributive services, information services and person-centred services (based on Miles, 1993). Health and education industries represent another grouping that is mostly provided by the Government and so is largely outside the scope of this inquiry (Chapter 1).

Table 2.1 Service industry groups used in this report

Distributive industries	Information industries	Person-centred industries	Health and education industries
Wholesale trade	Information media and telecommunications	Accommodation and food	Education and training
Retail trade	Financial and insurance	Rental, hiring and real estate	Health care and social assistance
Transport, postal and warehousing	Professional, scientific and technical	Administrative and support	
		Arts and recreation	
		Other services	

Understanding productivity

This inquiry seeks to provide policy options to lift productivity in the services sector. A country's productivity is a key determinant of its standard of living. All other factors being equal, the higher the productivity of a country, the higher the average income of its citizens. Productivity growth allows countries to enjoy increasing wellbeing, including better-quality health, better education and environmental quality, and more time for leisure.

Productivity is about how well firms and other organisations employ resources such as labour and capital (inputs) to produce goods and services (outputs).

There are two main measures of productivity: labour productivity and multi-factor productivity (MFP). Each is appropriate for different purposes. These productivity measures sit within the wider economic concepts of economic efficiency and wellbeing (Box 2.4).

Box 2.4 Efficiency, productivity and wellbeing

Economic analysis aims to find ways to increase *wellbeing* by maximising what, technically, is called *economic efficiency*. *Economic efficiency* requires productive, allocative and dynamic efficiency.

- Maximum productive efficiency requires that goods and services be produced at the lowest possible cost.
- Maximum allocative efficiency requires the production of the set of goods and services that consumers currently value most, from a given set of resources.
- Dynamic efficiency is concerned with the optimal rate of innovation and investment to improve productive efficiency over time. Maximum dynamic efficiency is achieved when allocative efficiency

is met for investments, including investments in innovation and future productive capability (APC, 2013).

Productivity is generally a measure of current productive efficiency.⁵ *Productivity growth* is a measure of the growth in productivity over time, which importantly reflects the contribution of dynamic efficiency.

Efficiency is a broader concept than *productivity*. Improving economic efficiency can involve reducing the costs of production per unit of output (improving productive efficiency), matching the supply of goods and services to those most desired by individuals (improving allocative efficiency), and/or removing barriers to innovation and flexibility (improving dynamic efficiency).

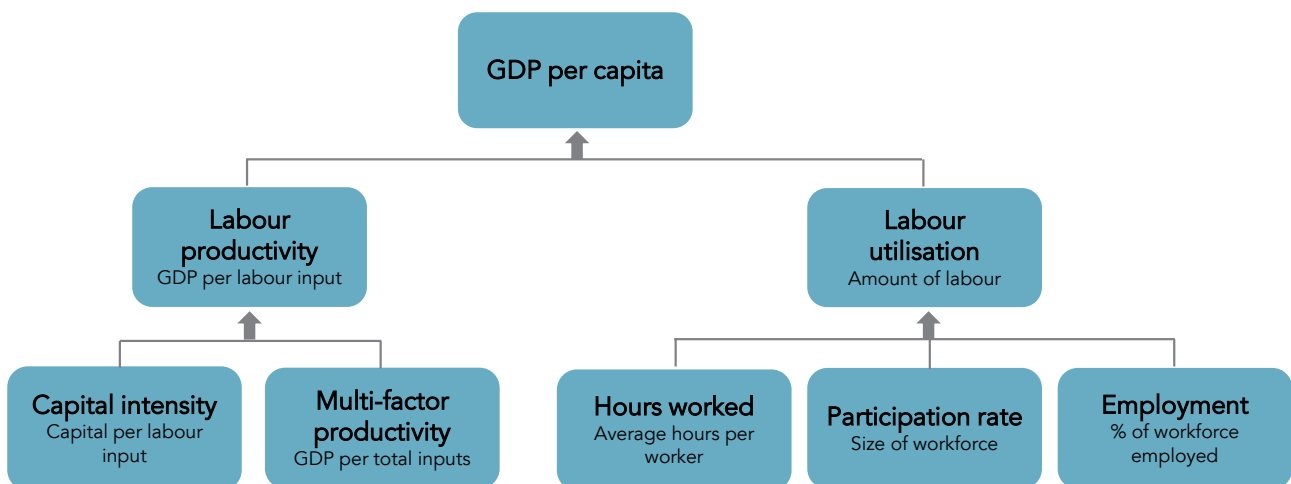
Wellbeing is, in turn, a broader concept than economic efficiency. It includes both material and non-material determinants of living standards (beyond income). It recognises that freedoms, rights and capabilities are important; that the distribution of living standards across different groups in society is an ethical concern for the public and a political one for governments; and that the sustainability of living standards over time is central to ensuring that improvements in living standards are also enjoyed by future generations (New Zealand Treasury, 2011).

Labour productivity

Labour productivity is the output produced for each unit of labour employed.⁶ Labour productivity is typically measured as the average output for each hour worked.⁷

Labour productivity is an important measure because of its strong link to incomes and living standards. The standard growth-accounting framework decomposes GDP per capita – the main indicator of material wellbeing used for comparison between countries – into labour productivity and labour utilisation (Figure 2.3). The framework further decomposes labour productivity into capital intensity and MFP.

Figure 2.3 Decomposition of GDP per capita



Labour productivity is a widely-available measure of productivity as its measurement is relatively straightforward (see Appendix C). Labour productivity levels and growth rates vary significantly among service industries (Chapter 3) owing in particular to differences in the level and growth of physical capital intensity and multi-factor productivity (Conway & Meehan, 2013).

⁵ If all inputs and output are valued at market prices, then productivity is conceptually the same as productive efficiency.

⁶ "Output" in this context is value-added adjusted for changes in price and quality. See Appendix C for more information.

⁷ Labour productivity can also be measured more simply (but less accurately) as output per worker.

Capital intensity

Capital intensity is the average amount of capital available to each unit of labour. An increase in capital intensity (*capital deepening*) is associated with an increase in labour productivity; for example better tools and equipment will generally increase output per worker.

Capital deepening can change skills requirements. For example, ICT investments can complement the analytical tasks primarily performed by highly educated workers and substitute for routine tasks generally performed by middle-educated workers (Michaels, Natraj & van Reenen, 2010; Chapter 8).

Capital intensity is also affected by the cost of capital and other factors. Distortions in the economy that increase the cost of capital will reduce opportunities for profitable investments.

Multi-factor productivity

MFP measures how well an economy, industry or firm uses a combination of inputs, typically capital and labour, to produce output.

MFP *growth* represents the change in output that is not due to changes in the amounts of labour and capital inputs. MFP growth captures a range of influences, including the impacts on output of technological progress; improvements in the quality of management, capital, labour and production techniques; and increased economies of scale.

MFP cannot be measured directly, because it is not possible to measure directly the level of technology and efficiency in an industry or an economy. MFP growth is calculated as a residual; and so it also includes effects from any unmeasured inputs and any mis-measurement of inputs and outputs.⁸

Measuring service industry productivity

Measuring the productivity of service industries is often hard (Djellal & Gallouj, 2008; Triplett & Bosworth, 2004). Challenges include designing suitable volume measures⁹ of output for services that are highly differentiated in quality (or other attributes valued by customers) and in estimating the value of output for non-market services. For example, Burgess (2011) explored the difficulties of measuring the output of financial services industries while Haldane (2010) noted that the apparently high measured output of the UK financial sector was in fact measuring the return to risk – as distinct from the value added by managing risk. He concluded that “risk illusion, rather than a productivity miracle, appears to have driven high returns to finance” (p. 2).

The New Zealand Council of Trade Unions raised concerns about productivity measurement in specific service industries:

Even in apparently less skilled services such as road transport there can be externalities such as pollution, road safety, and (in the case of passenger transport) passenger safety and experience which may not be captured in price or volume information.

Given the lack of competition in the banking sector which dominates the Financial and Insurance Services industry, and its ability to generate activity of dubious social utility, we do not consider its measured productivity levels and changes should be taken at face value. (sub. 12, p. 4)

Statistical agencies are well aware of measurement issues and have worked to address them. Appendix C provides further information on productivity measurement in service industries.

The official productivity statistics are calculated and reported as industry, sector and economy-wide averages. Looking at averages alone can mask significant variation at lower levels of aggregation. It is plausible, and indeed likely, that analysis performed at alternative levels of aggregation – for example the sub-industry level – would offer different insights and findings.

⁸ For example, any improvement in the quality of labour via increased education will typically be measured as higher MFP.

⁹ Volume measures are used to remove the effects of price changes from productivity data. For example, the measured productivity of a steel mill should not change solely because of a change in the price of coal or iron ore (inputs) or steel (output).

Cross-country comparisons are particularly difficult. Relative productivity levels and growth are affected by differences in industrial classifications and industry composition between countries. This means that the measurements are not always comparing like with like.

The Commission acknowledges these challenges. The analysis in this report draws on the best data available, and, where feasible, uses multiple analyses and datasets. The findings presented are those consistent with international research.

Increasing firm productivity

Influences on firm productivity can be roughly divided into two areas: influences that a firm has some degree of control over (internal influences) and influences from a firm's external operating environment (external influences). Table 2.2 summarises these influences. Appendix E provides more details about them.

Importantly, firms seek to maximise profitability, rather than productivity. Profitability is directly affected by the changes in market prices that are removed from productivity measures. However, in many – but not all – cases, actions by management and workers to improve firm profitability also increase productivity.

Table 2.2 Examples of influences on firm productivity

Internal influences	External influences
Human capital investment (including in management quality)	Knowledge spill-overs
Capital investment	Economic geography
ICT investment	Competition
R&D investment	International links
Learning-by-doing	Regulation
Workplace culture	Macroeconomic environment
Business models and processes	Institutional quality
	Infrastructure

Source: Appendix E.

2.3 The transaction perspective

The transaction perspective offers a useful basis for examining the effects and efficiency of government intervention, as this perspective focuses on the operations of markets. Governments intervene in service markets in many ways, often with the aim of lowering transaction costs. Interventions include providing infrastructure and regulating market transactions.

Transactions involving services are often complex. Understanding why complexity arises, and how it impacts on trade in services, helps to explain key features of the services sector. Given that services are sometimes bundled together with goods at the point of sale (section 2.4), services can also add complexity to transactions in goods.

What distinguishes service transactions?

Service transactions can be distinguished from goods transactions along two dimensions (Figure 2.4).

- The horizontal axis reflects the nature of the object of the transaction: the intangible versus the tangible. Transactions in intangibles are service transactions.
- The vertical axis reflects the distinction between an ownership and a rental transaction. Rentals – access to resources for a limited period of time – are service transactions.

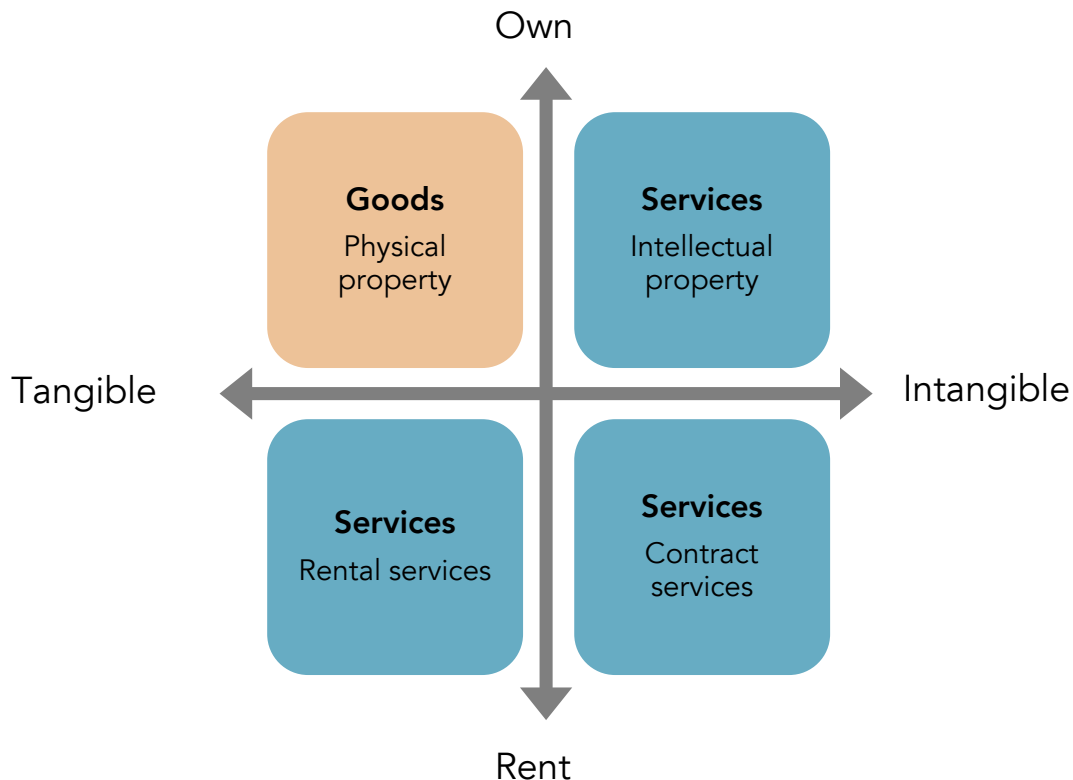
In Figure 2.4, transactions that change the ownership of physical goods appear in the top left quadrant. From the transaction perspective, the degree to which the good embodies services is not relevant to this classification. For example, a supermarket checkout is a location for goods transactions, not retail service transactions.

Transactions that involve a change of ownership of intangible property appear in the top right quadrant. Examples include the creation of a logo for a corporate client, the sale of patents, and copyright in books. The adage “possession is nine-tenths of the law” is rarely applicable to intangible property, so the legal mechanisms that create and define the ownership rights that underpin these transactions tend to be more complex (Arora & Gambardella, 2010).

Transactions involving rental of tangible items (eg, car hire) appear in the bottom left quadrant. Rental involves the transfer of specified rights for a limited time. Contracts underpin rental transactions.

Lastly transactions involving the rental of intangibles appear in the bottom right quadrant. Examples include telecommunications service agreements and consultations with doctors. The quadrant encompasses the rental of human time and expertise (ie, labour). These transactions are often highly dependent on complex contracts and/or legal frameworks. However, that complexity may not be evident to the parties, at least not until things go wrong, from the perspective of one party or both.

Figure 2.4 Distinguishing characteristics of goods and services transactions



Legal frameworks and property rights

Legal frameworks for property rights and contracts underpin transactions in both goods and services. Governments have an important role in establishing the legal frameworks underpinning contract law and property rights.

For a good or service to be supplied commercially in a market economy, one or more suppliers need to be able to capture sufficient revenue – directly or indirectly – to cover their input costs. The service needs to be *excludable* – the supplier needs to be able to prevent customers obtaining their product for free.¹⁰

¹⁰ What is “free” can be subtle in some markets. For example, internet searches are typically a two-sided market involving consumers and advertisers. Consumers “pay” for their searches by viewing advertisements. “Free” in this context might mean consumers blocking the display of advertisements, a practice that, if widely adopted, might reduce the willingness of advertisers to fund the search service.

If suppliers cannot recover their costs, they will not provide the good or service concerned. When this happens because of non-excludability it may indicate a form of market failure. Suppliers forgo any profits they might have made, and wages may also be forgone. Potential customers forgo any benefits from purchase, or substitute a less-desired alternative.

Some services are by their nature excludable: tied to a person, a time, a location or some combination of them. Examples include consultation with a doctor and a seat on a plane. Effective mechanisms exist for dealing with non-excludability for many other services, including through contracting arrangements, the creation of property rights, regulation, and tying the service to a good or a more-excludable service. Technology can be used to make a service excludable. For instance, SKY TV transmissions are scrambled, requiring customers to rent a decoder to access programmes.

Many services are based on intangible assets such as knowledge. The property rights surrounding such assets are particularly important (Box 2.5).

Box 2.5 Property rights in knowledge

Knowledge, in general, is only partly excludable (Romer, 1990), as it can often be observed by others who may not have contributed to its creation. However, its non-rival nature can make it immensely valuable when it is copied at low cost and applied in many situations. This risks a situation in which knowledge creators are poorly rewarded and knowledge is under-produced in a market economy. To avoid this governments sometimes fund research that is openly shared and/or grant property rights in knowledge to increase private incentives to create it. For example, patents create property rights over technology innovations, and copyright creates property rights over some types of information and the output of creative industries.

Designing property rights over such *intangible assets* is challenging. Weak property rights encourage the spread of existing knowledge, but risk under-investment in new knowledge. Property rights that are overly strong can unduly restrict beneficial use and market entry, or deter innovation, particularly if those rights offer veto power over subsequent or parallel innovation (Clark & Konrad, 2008; Heller & Eisenberg, 1998). Some authors propose that the standard patent period should be varied according to the specific characteristics of the industry (eg, Encaoua, Guellec & Martinez, 2006).

Services can involve high transaction costs

Transactions costs are costs incurred by the parties to a transaction in addition to the price paid (Coase 1937; 1960).¹¹ They come in many forms, including search costs (finding a party to transact with), spatial transaction costs (the additional costs of trading at a distance), information costs (determining prices and quality), bargaining costs (agreeing on contractual terms) and enforcement costs (ensuring that parties abide by the contract).

Reductions in transaction costs may increase both the number of transactions and the economic wellbeing those transactions create. Transaction costs can create market failures and seem to indicate a need for government intervention. Yet an important insight from the economics literature is that firms, workers and consumers can often find market solutions to problems that transaction costs create (Cheung, 1973; Coase, 1974).

Coase emphasises the need to understand the particular circumstances of how a market operates before making a judgement about whether or not government intervention will yield an improvement.

The next two subsections discuss the effect of two particular types of transaction costs on service markets: spatial and information costs.

¹¹ If transaction costs are sufficiently high, there may be no price at which the parties will voluntarily transact.

Spatial transaction costs

Spatial transaction costs – the extra costs incurred because production and customers are not co-located – are a significant component of transaction costs. They include transport costs, such as the cost of getting a customer to a shop, a musician to a concert hall, or a customised report to the customer who commissioned it.

Spatial transaction costs also include costs that arise when complex information is poorly communicated over distance.¹² Markets rely on information. Some information (eg, reputations) relies on dense networks for its transmission, and these thin out with distance. If information is difficult to convey other than face-to-face, the cost of providing a given level of service quality increases with distance (Duranton & Storper, 2007). Spatial transaction costs create a “home bias” that favours local service providers.

The rapid increase in international business travel may be partly explained by the growing importance of face-to-face communication given the complexities of modern business relationships and business-to-business services (McCann, 2009).¹³

Spatial transaction costs for services are in many cases higher than those for goods. For some services these costs are effectively infinite; for example, it is impractical to deliver a restaurant meal freshly made in Auckland to a customer in Wellington.

Service suppliers take a variety of approaches to minimising total spatial transaction costs. In a competitive market, service providers can be expected to pick a minimum-cost combination of the five modes of services trade (Box 2.6). For example, a cafe owner in a CBD area may open an outlet (mode 3 – commercial presence) 250m away from their existing cafe if their additional costs are less than those faced by their customers having to walk an extra 250m (mode 2 – consumer travel). The owner of software intellectual property may choose to export a good embodying the software (mode 5), rather than license the software to a manufacturer (mode 1) in a country with weak protection for intellectual property rights.

Box 2.6 The five modes of services trade at a distance

The General Agreement on Trade in Services (GATS) classifies international services trade into four different modes. In the context of the GATS, these relate to international trade, but they are equally as relevant to trade between geographic areas within a country. The modes are:

Mode 1: Direct trade where a service flows from one location to another; for example, banking or architectural services provided over the internet.

Mode 2: Consumer travel where a consumer travels to another location to obtain a service; for example, tourism.

Mode 3: Commercial presence where a service supplier establishes a permanent presence in another location to provide the service; for example, a hotel chain.

Mode 4: Supplier travel where an individual service provider travels temporarily to provide a service; for example, consultancy services provided by an individual out-of-town or in another country.

Data on services as a source of value-add in exported goods suggests a fifth mode, which is not included in the GATS classification:

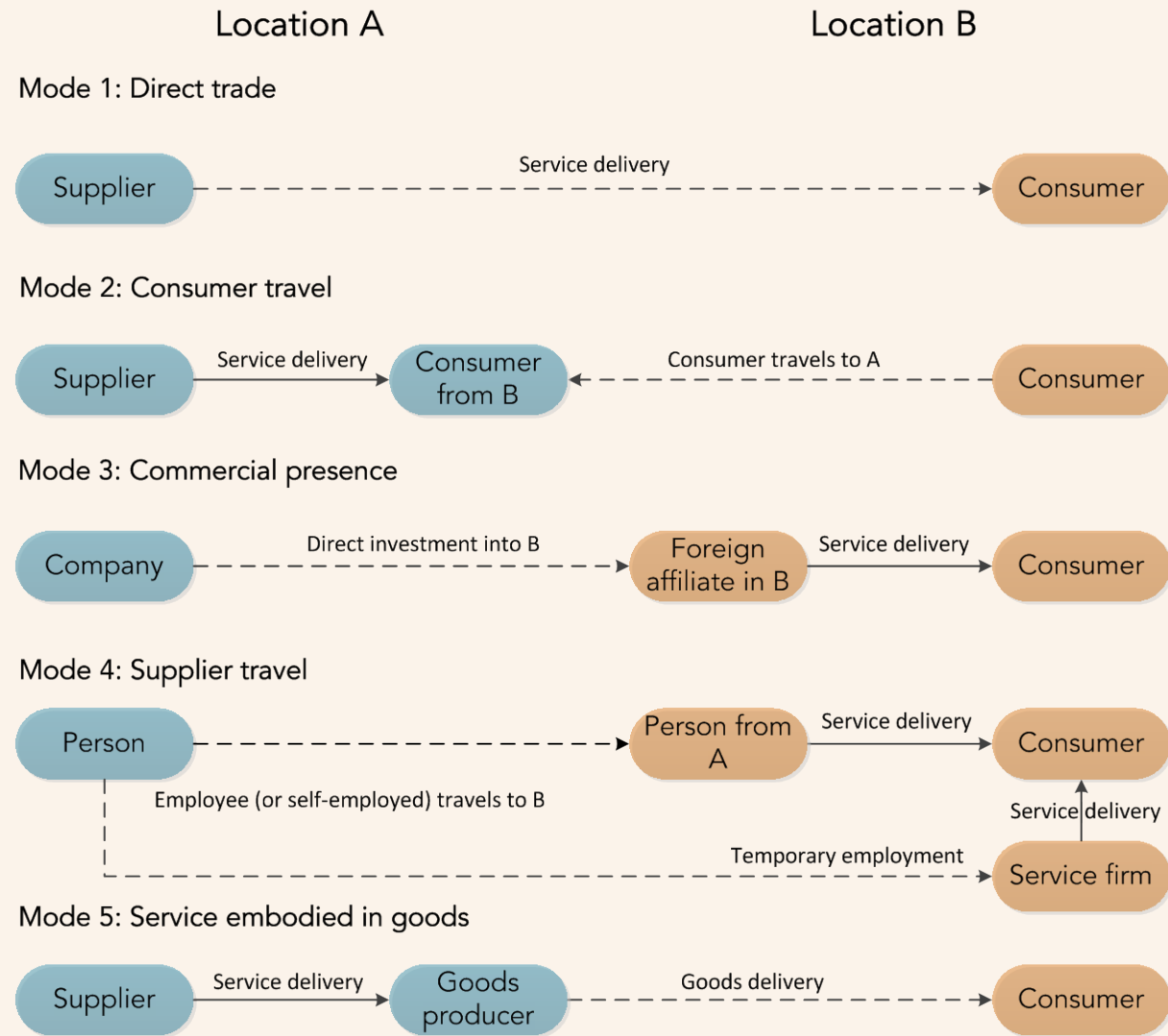
¹² Complex information is more effectively communicated face-to-face, placing a premium on co-location (Storper & Venables, 2004; Gaspar & Glaeser, 1998; McCann, 2007).

¹³ The steep rise in the amount of international business also reflects the declining costs of international business travel.

Mode 5: Services embodied in goods where a significant proportion of a good’s value is created by services, and that good is transported from supplier to consumer.

Services trade via these five modes is depicted in Figure 2.5.

Figure 2.5 Modes of services trade



Source: Productivity Commission; McLachlan, Clark & Monday, 2002.

New Zealand is geographically remote and has a small population. The costs of passenger transport are relatively high (Gemmell, 2014a), affecting services trade via modes 2 and 4. Relatively high external and internal freight transport costs (NZPC, 2012a) affect services traded via mode 5.

Innovation that reduces spatial transaction costs

Innovations that reduce spatial transaction costs and so increase the size of service markets can assist in increasing services trade. Phil Hayward noted that over time “transport and communications have continually substituted for proximity. The extent to which this substitution has occurred depends on the type of business” (sub. 1, p. 2).

Such innovations can be institutional, contractual or technological.

- Moving from single-stage to multi-stage supply chains can improve productivity for services that need to be supplied at many, dispersed points of demand. For example, franchisee fast-food production involves concentration of back-room functions to exploit economies of scale in purchasing, production, training and marketing.

- Codifying a service increases its tradability. Codification means that requirements can be clearly described, quality can be easily monitored and contracting is efficient and enforceable. Suppliers can exploit economies of scale, and competition occurs at the global level. For example, standardisation of components and business processes, and the increased use of English as the common language of business have assisted India to become a preferred location for corporate software development and likewise China for manufacturing of goods designed in another country.
- Technological change is reducing spatial transaction costs for some services, typically those directly traded (ie, via mode 1). For example, the falling cost of transmitting images via the internet has allowed radiological services to be traded between countries.

Some commentators (eg, the New Zealand Institute, 2007a) have promoted the concept of “weightless exports” – products and services that are costless to transport – as a means of overcoming the disadvantages of New Zealand’s remoteness and small size (Box 2.12). However, the competitive dynamics of firm location in response to falling spatial transaction costs is not straightforward (Box 2.7). Near-zero spatial transaction costs imply that production can be located anywhere – and not necessarily in New Zealand. The optimum location for a firm with zero transport costs is determined by other cost factors.

Box 2.7 Spatial transaction costs affect firm decisions about the location of production

Firms optimise their location based on the overall costs and revenues. The spatial transaction costs involved in delivering a product to customers may affect location decisions. Three particular cases can be distinguished.

1. If spatial transaction costs are negligible, production can potentially serve global demand from anywhere.
2. If spatial transaction costs are moderate, the aggregation of production allows access to agglomeration benefits and economies of scale.
3. If spatial transaction costs are sufficiently high, production will be highly dispersed with local production meeting local market demand.

A service that falls into case 1 will be produced in few countries. Production is *footloose* – it will occur wherever the cost of inputs is lowest. For example, call centres that serve large clients are often located in low-wage countries such as India and the Philippines.¹⁴ Other countries benefit from being able to import the service at globally-competitive prices.

All countries produce a service that falls into case 3, typically at many locations. Examples include haircuts, cafes, accommodation and veterinary services. Prices will be largely determined by the opportunity cost of other inputs (including labour). For example, a haircut in the Auckland CBD will usually cost more than the equivalent service in Oamaru.

Depending on the relative size of spatial transaction costs (which lead to dispersed production) and economies of scale and agglomeration economies (which encourage concentration of production), countries may import or export services in intermediate cases (case 2).

The effect of a reduction of spatial transaction costs for a specific industry in New Zealand depends crucially on how that industry is currently affected by those costs.

If the industry falls between cases 2 and 3, then reduced costs might support increased aggregation within New Zealand, with consequential agglomeration and scale benefits.

Conversely, if the industry is between cases 1 and 2, then a reduction in costs will increase its exposure

¹⁴ Unfamiliar accents and lack of deep cultural knowledge can also be considered as spatial transaction costs for some clients. These costs can lead firms to preferring locations such as New Zealand to serve specific markets.

to international competition. If the local industry has a relatively low-cost structure, then the reduced costs will improve its ability to export. If local costs are high, then the local industry will likely contract. For example, transporting music over the internet has given global music retailers such as Apple's iTunes a boost. The number of music retailers with a physical presence in countries like New Zealand has contracted.

Source: Productivity Commission; Krugman, 1991; Krugman & Venables, 1995; McCann, 2008.

De Serres, Yashiro and Boulhol (2014) caution that physical distance still matters for services:

...the extent of services that are no longer affected by physical distance (i.e. that can be codified and traded electronically, and at the same time that have high information content and do not require face-to-face contacts) remain relatively limited. Many services, in particular high-value ones such as consultancy, design and R&D, still require for the most part local knowledge, physical contact and often a commercial presence in the client country, all aspects where distance remains relevant to some extent. (p. 29)

Competition versus scale in localised markets

Localised markets can occur when demand is dispersed and spatial transaction costs are high. For example much of the output of person-centred and health and education industries, and some information industries, is produced at thousands of locations across the country. This reflects the high costs typically involved in delivering those services at a distance.¹⁵ However, markets for such services can be thicker¹⁶ where demand is concentrated, for example in larger cities.

Localised markets may involve a trade-off between firms being able to operate with significant economies of scale and there being enough firms to exert competitive pressure. A major issue for New Zealand is that its small service markets do not often allow both scale and competition. Low levels of competition may lead to higher prices:

...on occasion [services] come with a ridiculous price tag as they are not subject to the same competitive pressure as the traded economy. (New Zealand Manufacturers and Exporters Association, sub. 6, p. 2)

Weak competition is also associated with poor service and limited innovation. On the other hand, high transaction costs may make localised markets an economically efficient outcome for both goods and services. Finding the right balance between scale and competition creates challenges for competition regulators (Evans & Hughes, 2003).

Aggregate (crushed rock) in New Zealand is a rare example of a localised market for a non-perishable good. Aggregate is produced in about 600 quarries across the country: "it is a low value per weight product, so its cost increases sharply with distance, doubling every 30km. Most aggregate is produced and used locally..." (Richard Paling Consulting, 2008, p. 60). Most goods, however, are produced at relatively few locations and are distributed widely. They are transported to locations that balance the cost of distribution against the convenience and transport costs of customers.

Tradability is the degree to which a good or service can be traded across a distance. It is inversely related to spatial transaction costs. Chapter 5 presents estimates of the domestic tradability of the output of New Zealand industries within New Zealand. The index is relatively high for the information industries and for wholesale trade, and relatively low for other service industries.

Trading across international boundaries

International boundaries create additional spatial transaction costs, and have significant impacts on services trade. These costs and their effects are discussed in section 2.6.

¹⁵ Technological developments in remote health and education offer the promise of improvements in the tradability of these services in future.

¹⁶ A thick market is one with multiple buyers, multiple sellers, and efficient matching of buyers to sellers.

F2.1

Spatial transaction costs – the extra costs incurred because production and customers are not co-located – are often higher for services than for goods. High spatial transaction costs can lead to localised service markets. Competition regulators may need to strike a balance between competition and economies of scale in production in these markets.

Information costs

Transactions are more likely to benefit buyers and sellers when both are well informed.

Customers of both goods and service providers often face an *information asymmetry*. Indeed, information asymmetry may be the basis of the transaction, for instance in obtaining an expert legal opinion or consulting a specialist medical practitioner. The supplier knows the quality of the product they intend to supply, but higher-quality suppliers find it hard to credibly signal this information to prospective customers, given that lower-quality suppliers can make similar claims (Akerlof, 1970).¹⁷ The intangible nature of many services compounds the problem if it means that customers have no easy way to determine service quality before they receive it. Indeed, they may not be in a position to determine quality following the transaction. For example, it could be some years before a consumer can judge the value of a legal opinion.

Difficulties in observing service quality can make it harder to obtain a remedy for poor service. A customer returning a broken vacuum cleaner to a store is likely to have relatively little difficulty in agreeing with staff that the item is, in fact, broken, as a first step in obtaining a suitable remedy. It is likely to be more difficult to reach agreement with a psychologist or lawyer that the service provided was not up to the anticipated standard. If customers anticipate difficulties in obtaining a remedy this adds to the transaction costs and may discourage trade.

Low-quality service provision may create unacceptable risks for service purchasers or impose costs on third parties. For example an inexperienced bus driver could be a hazard to passengers and other road users, but a hazard that passengers cannot manage prior to embarking.

Standard regulatory responses to these problems include mandating minimum quality levels, backed by quality-control inspections; statutory warranties; or licensing occupations and/or service providers. Information disclosure requirements can make product quality more transparent.

There may be no private rewards to improving quality beyond a mandated minimum quality level. If consumers have no reliable signals of higher quality above the minimum, they will only pay for minimum quality (Akerlof, 1970). Branding, guarantees and quality certification are market mechanisms that help to overcome this problem.

Mandated minimum quality levels can reduce affordability particularly for those on low incomes. At the same time it can encourage clustering at or near the mandated minimum, denying consumers the benefits of variety at the lower end of the quality spectrum. While there can be situations in which firms provide a confusing array of products in order to make it harder for consumers to switch to a competing supplier (Chapter 6), in most cases product variety enhances consumer welfare (Box 2.8).

Box 2.8 Service-product variety enhances consumer welfare

High levels of product variety – including variety in quality – create value for consumers when they can find something that more closely matches their needs. That created value can be shared with the supplier as the customer is willing to pay a higher price for their preferred variety, or to make a purchase that they would not otherwise have made.

In deciding how many varieties to produce, a firm faces a trade-off between increased revenue from

¹⁷ Consumer laws aim to prohibit false and misleading claims; however the laws cannot ensure that all claims are accurate or correctly interpreted.

customers and the incremental cost of producing additional variety.

A feature of many services is relatively fewer economies of scale in production than is typical for goods.¹⁸ This shifts the optimal trade-off towards increased variety, as the incremental cost of additional variety will be smaller.

The supply of some services is amenable to individual customisation – the ultimate in variety. Examples include doctors and accountants, who provide information highly specific to their customers' particular circumstances.

Source: Katz & Shapiro, 1985; Farrell & Saloner, 1986.

Information asymmetries affecting suppliers and customers are also likely to exist within firms. The internal costs of monitoring quality may affect the optimal firm size, or make it advantageous to use particular organisational forms such as cooperatives. Information costs are not fixed over time. For instance, ICT has enabled integration of supply chains across wholesaling and retailing and the monitoring of store operations at a distance. It has also enabled the aggregation and analysis of data on customer demand to shape pricing and promotion decisions. As a result, in large economies the most productive retailers have grown enormously in size and geographic span, and have established international supply chains internal to the firm (Appendix I).

Ideally, regulation should be neutral to organisational form, rather than mandating specific models. This will allow firms to experiment to find the most efficient organisational form to manage the transaction costs associated with information asymmetries and distance.

The Lawyers and Conveyancers Act 2006 provides an example of restrictions on organisational form. It requires that control of incorporated law firms remains in the hands of lawyers actively involved in the practice, and that ownership resides only with those lawyers and their relatives. This prevents, for example, law firms offering non-legal staff equity participation in the firm and prohibits large law firms from raising capital through a public offering.

The ownership of pharmacies is similarly restricted by regulation – yet there would likely be scope for significant gains in productivity through greater flexibility. Foodstuffs submitted:

The New Zealand government announced its intention to de-regulate pharmacy ownership in 2002, however the proposal was later abandoned in the face of strong opposition from the pharmacists' community. Instead the Government made modest changes to the Act to encourage pharmacists to enter joint ventures with other parties. The requirement for pharmacists to maintain a 51% controlling shareholding, and limiting their ownership interests to no more than five pharmacies, undermined the intent to open up pharmacy ownership and today, more than 10 years later, there are only a handful of such joint ventures. (sub. 212, p. 2)

F2.2

Information asymmetries can be more pronounced in service transactions than goods transactions due to the difficulties in assessing service quality before or after purchase. Information asymmetries, together with the risk of adverse consequences for customers and the public, and difficulties in obtaining remedies for poor service quality, prompt governments towards extensive regulation of many services.

2.4 Services are embodied in or bundled with goods

The relationship between goods and services is complex in practice. Services are used to produce goods (or are "embodied" in goods). Services and goods are often bundled together for sale.

¹⁸ An exception is the distribution of digital goods, for example music. Such distribution exhibits strong economies of scale.

Services are embodied in goods

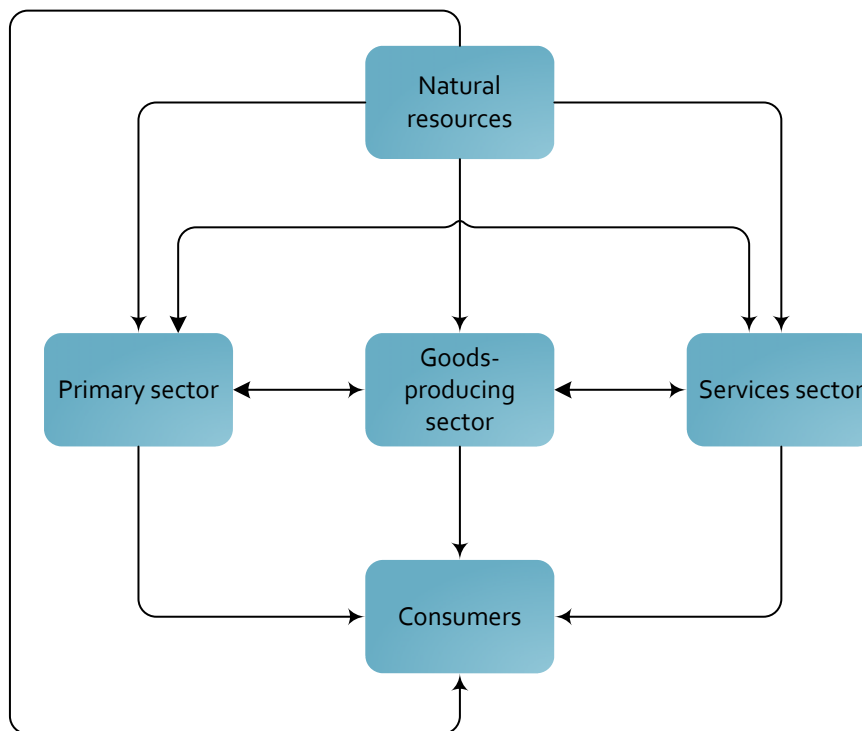
Goods are rarely (if ever) produced without some level of services input – a quarry producing rock for example, is likely to use services provided by freight companies, accountants and solicitors. Similarly, services are rarely (if ever) produced without some input of goods – even a massage likely requires a table, towels and oil.

As expressed by the New Zealand Manufacturers and Exporters Association:

The idea that services, primary and goods producing sectors can be considered independently is flawed. (sub. 6, p. 1)

Even at a broad level, New Zealand's services sector is highly interlinked with the wider economy (Figure 2.6). A large part of the value of goods produced by the primary and goods-producing sectors is made up of services such as accounting and transport (Chapter 4). Similarly, goods or natural resources are often inputs into the "services" produced by the services sector. For instance, scenery, a natural resource, is an input into tourism services.

Figure 2.6 A web model of the economy



Notes:

1. This diagram does not include investment and exports as components of final demand alongside consumption.
2. The information flows from consumers back to producers about the quality and type of goods and services they prefer are also important. They are not included in this diagram.

The rise of outsourcing

Just as the distinction between goods and services is blurred, so is the distinction between employment and contracted services as intermediate inputs to production. Twenty-first century economies are characterised by increasing interconnectedness, specialisation and complexity. Organisations cannot efficiently obtain the full variety and quality of services they require in-house. The purchase of services from external suppliers complements in-house provision, and can substitute for it where the transaction costs of services contracting are low. When transaction costs are high – for example caused by difficulties in specifying the required outputs – this tilts the balance towards in-house service provision.

The shift from in-house to outsourced provision of services creates measurement issues. For example, the output of a lawyer employed by a manufacturer is likely classified as manufacturing; but should the lawyer

service. Increased outsourcing explains part, but by no means all, of the increasing employment in the services sector and decreasing employment in the goods-producing sector (Schettkat & Yocarini, 2006).

Products are often bundles of goods and services

Products sold to customers are often bundles of goods and services (Box 2.9).

Box 2.9 Goods and services are bundled for sale

Inquiry participants pointed out that products are increasingly likely to be a mixture of goods and services.

The delineation between traditional goods and services is blurring as customers demand service functionality (such as customer care) with physical goods and hardware with their services. (Vodafone New Zealand, sub. 8, p. 5)

Many businesses, both in New Zealand and offshore, now sell a complementary range of services around their main product. This ensures that they can meet the needs of their customers, while at the same time providing an additional stream of revenue. (BusinessNZ, sub. 9, p. 6)

As manufacturing becomes more elaborate, devices are bundled with different services to form a product. ... bundles of device and services increasingly blur the distinction between services and products. (New Zealand Manufacturers and Exporters Association, sub. 6, p. 2)

Castalia Strategic Advisors (2014) described recent changes in New Zealand's manufacturing industry.

...high growth manufacturing firms in New Zealand are creating new business offerings which link products and services together. Catalysts shaping these new product-service packages include:

- the increasing power of the client and demands for customisation
- the shift towards outsourcing of both production and business related activities
- new products and technology, especially radical or sophisticated, generating customer demands for information, training, help desks and similar services, and
- efforts to capture distant markets through collaborations with local distributors and services companies.

New Zealand manufacturers now consider themselves as not only specialist manufacturers but also marketers, sellers and service providers. (p. 3)

F2.3

The services sector is highly intertwined with the primary and goods sectors. Policy development should recognise this interdependence between the three sectors.

2.5 Regulating service industries and markets is hard

Government is extensively involved in service markets as an owner, as a customer and as a regulator. Regulation serves a wide variety of purposes. There is potentially a trade-off between the stringency and volume of regulation and the ability of firms to choose inputs and production methods that raise productivity and increase profits. This potential trade-off leads to diametrically opposite views about whether, at a broad level, regulation should be relaxed or increased (Box 2.10).

Box 2.10 Contrasting views on regulation of services

The New Zealand Council of Trade Unions submitted:

The [Commission's] Report has a strong emphasis on regulation being central to the problems identified. New Zealand has had several rounds of deregulation and reviews of regulation which

have not in the end brought our country closer to the OECD average level of productivity. There have also been negative consequences of some aspects of deregulation (leaky buildings, adverse health and safety of workers, loss of capacity in skills development). The recent 'Productivity Paradox' symposium found very little explanation for this paradox in our regulatory settings. Therefore we suggest it is time for a different approach that focuses more on identified problems on lack of scale, skills mismatches, low performance of management, and capital per worker. (sub. 113, p. 3)

In contrast the Insurance Council of New Zealand comments on the volume and fragmentation of regulation of the insurance industry:

There is no clear single piece of regulation for market conduct for the insurance industry in New Zealand. We have a number of regulatory supervisors and a number of relevant pieces of legislation in respect of market conduct. This fragmentation leads to inconsistent and sometimes inappropriate introduction of regulation. We also end up with confusion for consumers. This can act as a disincentive to investment in the industry as there is uncertainty around compliance and exposure. (Insurance Council of New Zealand, sub. 11, p. 3)

The Commission has considered the effects of regulation on productivity in the services sector throughout this report. The appropriate balance between achieving diverse regulatory objectives and boosting productivity needs to be considered on a case-by-case basis, taking account of the particular circumstances of the markets involved.

The potential benefits of effective and efficient regulation of service industries are likely to be large as service industries make up a relatively large part of the economy and provide important inputs to other industries. Moreover, regulatory barriers to competition and technology diffusion tend to be highest in service industries, including the service industries that use ICT intensively (Conway & Nicoletti, 2006).

Unintended consequences

Policy interventions can have complex effects and sometimes unintended consequences, as the imposition of minimum quality levels for rental housing illustrates:

... where households are in poor-quality accommodation because they have nowhere else to go [minimum-quality regulation] risks worsening their situation. Either repair costs will be passed on through increased rents, or in extreme cases the building may be condemned. This may generate greater risk for those who struggle the most to achieve adequate housing. (NZPC, 2012b, p. 207)

The Motor Trades Association provided a second example: requiring registered motor vehicle traders to offer consumer guarantees discourages them from operating at the lower-priced end of the market (Box 2.11).

Box 2.11 Mandatory guarantees and used cars

The retail sale of used cars is subject to the provisions of, among others, the Sale of Goods Act 1908, the Consumer Guarantees Act 1993, the Contractual Remedies Act 1979, the Fair Trading Act 1986, the Motor Vehicle Sales Act 2003, the Motor Vehicle Dealers Act 1975 and the Consumer Information Standards (Used Motor Vehicles) Regulations 2008.

This regulation aims to protect consumers. It reflects a view that:

- vendors know (or should know) more about specific cars than do potential customers;
- vendors have incentives to misrepresent what they do know;
- vendors are better able than customers to diversify the risk of faults unknown to both parties at the time of purchase; and
- market-based mechanisms (including reputations, voluntarily-offered guarantees and third-party

inspections) offer an insufficient level of consumer protection.

According to the Motor Trade Association, rather than serving to protect all consumers, the Consumer Guarantees Act has created a significant unintended consequence by pushing the market for older used cars almost exclusively to the consumer-to-consumer market where few consumer protection measures apply.¹⁹ Of the 732 000 used passenger vehicles bought and sold in 2012, 518 000 (70%) changed hands in the private market. Unregistered dealers are known to operate in the consumer-to-consumer market.

The Consumer Guarantees Act reduces the incentive for registered dealers to trade anything other than reasonably new second-hand cars. The older the car, the higher the risk of unknown faults and so the higher the potential costs of providing a guarantee. In addition, the law does not define the period that consumer protection applies, providing only the vague guidance of “what is reasonable”. Because of these risks, registered dealers largely avoid older, lower-priced used cars.

Source: Information provided by the Motor Trade Association.

Regulating intangible assets

Intangible assets – including employee skills, databases, design, organisational know-how, brands and intellectual property – determine the productivity of some service industries.

Regulations that affect intangible assets can have significant impacts (Andrews & de Serres, 2012). Such regulations include those involving the financing of start-up firms, the treatment of intangibles in corporate valuation and accounting frameworks, competition policy in the digital economy, and intellectual property rights.

Regulation needs to be imposed only when it is the best option for addressing an identified problem and should be evaluated regularly to ensure that it remains fit for purpose (NZPC, 2014b).

Barriers to entry

Regulation can create barriers against new entrants. Incumbent firms have an incentive to argue for more regulation if it disadvantages new entrants, resulting in less competition. Chapters 5–7 further explore competition in service industries.

Given that improved transport and communications infrastructure can reduce spatial transaction costs, the regulation of infrastructure, and of transport and communication links, is likely to particularly affect the productivity performance of service industries.

2.6 International trade in services

International boundaries create additional spatial transaction costs, and have significant impacts on services trade. Legal and regulatory systems change at borders, and service transactions rely on those systems. Enforcing a contract in another country’s legal system is typically more uncertain and more expensive than within the local system.

Unlike the tariffs applied “at the border” to the international trade in goods, barriers to international trade in services generally occur “behind the border” (World Trade Organization, 2012). Such barriers are termed *non-tariff measures* (NTMs).

¹⁹ Consumer protection may include the following. (1) If a private seller misleads a buyer about a vehicle, in some circumstances the Contractual Remedies Act 1979 applies and the buyer can take the seller to the Disputes Tribunal (MED, 2011a). (2) A buyer may have some rights under the Sales of Goods Act 1908 if they unknowingly bought a vehicle that the seller did not have the right to sell; or if the seller owed money on the vehicle or used the vehicle as security (Community Law, n.d.). (3) Buyers also have some protection under section 9.12 of the Land Transport Rule: Vehicle Standards Compliance 2002, 35001/1. The vehicle’s Warrant of Fitness must be less than one month old at the change of ownership, unless the buyer accepts this in writing (Ministry of Transport, n.d.).

Specific NTMs include rules around working visas (affecting services trade via mode 4), education and tourist visas (mode 2), and foreign investment (mode 3). Mode 1 services trade may be affected by regulation concerning data location, publishing and privacy. Mode 5 trade is affected by tariffs and NTMs that apply to the goods embodying those services.

Research on relative price changes in goods and services in New Zealand and Australia shows that service markets in New Zealand are generally much less integrated with Australia than goods markets (Conway, Meehan & Zheng, 2013). This supports the view that NTMs restrict trade in services between Australia and New Zealand. Large parts of the services sector operate quite separately in the two countries. Even so, some parts of New Zealand's services sector are well integrated with Australia's, at least in terms of ownership (eg, retail).

Free trade agreements covering services offer the potential of larger service markets. Benefits include increased scale for service exporters, and improved variety and competition in domestic service markets. Cross-border investment agreements are particularly important given the significance of mode 3 as an export mechanism for services.

Alongside explicit NTMs, trade barriers can arise simply because the regulatory systems in two countries are different. There are various ways to reduce barriers in situations with a high degree of compatibility in the objectives of those systems. These can be broadly grouped into unilateral and cooperative approaches (APC & NZPC, 2012).

Unilateral approaches include one country changing its regulatory system to mirror that of others. It also includes *unilateral recognition* – accepting that a person or product that meets the standards, qualifications and certifications of another country also meets the corresponding requirements of the recognising country. Another unilateral approach is to engage the services of an overseas regulator on a fee-for-service basis.

Cooperative approaches include mutual recognition, harmonisation, and the creation of cross-country institutions. The last two approaches may work in some circumstances, but can be slow, complex and potentially inefficient (APC & NZPC, 2012). Even if regulatory systems are largely aligned, the uncertainty that a service will not be legally, culturally or socially acceptable in a foreign market adds costs, and so reduces its tradability. Mutual recognition can be an efficient means to reduce the cost of regulatory uncertainty associated with services trade. Yet it requires a reasonable level of conformance between regulatory systems and a high level of trust between governments.

These considerations can also play out within a country. Differences in local government regulation or its implementation can deter businesses from operating across local government boundaries (NZPC, 2013b). Procurement policies that explicitly favour local suppliers deter market entry by non-local firms. If widely applied, such policies contribute to the creation of localised markets with subdued competition and higher prices.

Spatial transaction costs are not the only determinant of international trade. To the extent that countries have different economic characteristics that result in their firms facing different costs and opportunities, they tend to specialise and trade according to their comparative advantage.

The increasing importance of digital goods and services has led some to suggest that policy should encourage specialisation in “weightless” exports because of New Zealand's distance from world markets (Box 2.12).

Box 2.12 **Weightless exports**

The economy is becoming “lighter” all the time, in the sense that the physical weight of traded products has fallen relative to their value. In 1999, then US Federal Reserve Chairman Alan Greenspan commented that the “per capita physical weight of our gross domestic product is evidently only scarcely higher today than it was fifty or one hundred years ago” (Greenspan, 1999).

The term *weightless economy* (or *digital economy*) describes a post-industrial economy that uses ICT

to produce and deliver high-value output of exchangeable information, knowledge and other intangibles. ICT has enabled expansion of those parts of the economy for which the transport costs of exchange have fallen to near zero; for example, music and books ordered and delivered via the internet.

Skilling and Boven (2007) propose that New Zealand's distance from world markets lends it to specialising in weightless exports, noting that products and services with no weight are costless to transport. With no transport costs, New Zealand producers should be able to compete with those in other locations on a "level playing field" – one unaffected by distance.

However, small differences in transport costs can make large differences in the cost structures for some seemingly weightless products. Further, the costs of transporting data to and from New Zealand may not be all that low for New Zealand. The hosting of large-scale data centres for international clients was highlighted by the New Zealand Institute (2007b) as a potential weightless export. Yet such data centres have not eventuated, likely because they are adversely affected by data transport costs.

- Internet infrastructure, and in particular long undersea cables, is very expensive. Infrastructure will not be built unless prices allow infrastructure providers to recover their fixed costs. New Zealand, being small and remote, is therefore likely to face relatively higher international data transport costs for the foreseeable future.
- New Zealand has few high-capacity data connections with the rest of the world, and is therefore relatively vulnerable to loss of a single connection. Multiple, redundant connections would reduce this risk, but would be costly. Either way, New Zealand will be relatively unattractive as a location for large-scale data centres serving international clients.²⁰
- Data-intensive activities (such as matching information across two databases) can require multiple round trips between computer systems. The relatively small delays in transmitting data across a distance can accumulate to the extent of making some types of activities too costly.²¹

Whether spatial transaction costs are a constraint – or irrelevant – for a New Zealand-based business depends on the specific activities of the business. The relative reductions in spatial transaction costs via use of the internet compared to conventional transport could be greater for New Zealand producers. However, the view that the internet means that New Zealand producers can compete as if they were unaffected by distance overlooks the factors described above.

Is New Zealand missing opportunities for service exports?

Statistics New Zealand's data for services exports show that a large number of services that are tradable within New Zealand are not traded internationally to or from New Zealand. This may indicate a missed opportunity and regulatory and other barriers to services trade. It could also reflect other reasons, for example:

- Financial services are less tradable across borders than within an economy because of differences in currencies and systems. Transactions in each currency have to be processed and settled within the clearance and settlement system of the country that issues that currency.
- Wholesale trade may be internationally tradable. For example, it may be efficient to supply many European countries from a single warehouse. However, New Zealand is an unlikely location for warehouses serving international markets.

²⁰ International connectivity and its effects on adoption of ICT by New Zealand firms is discussed in Chapter 9.

²¹ Data transport delays (termed "latency") are discussed in Chapter 11.

- Statistics New Zealand's data for services exports excludes mode 3 exports (ie, commercial presence in the importing country). Many types of services are more efficiently exported via mode 3, for example the construction project supervision services "exported" by Opus.

Chapter 5 discusses policy barriers to international competition in the services sector.

2.7 Summing up

This chapter signals the main subjects that the Commission covers in this report. The broad standard definitions used by statistical agencies are the basis for examining how the service industries in New Zealand contribute to the economy and how their performance compares with each other and internationally (Chapters 3 and 4). This, in turn raises questions about the features of services that might explain the patterns observed in the broad data.

Spatial transaction costs create localised markets for many services, and limit the extent to which other services can be traded internationally (Chapter 4). These factors create a trade-off between scale and competition for some New Zealand service markets. In turn, smaller scale and/or weaker competition likely reduce productivity levels relative to the same industries in larger economies. This trade-off suggests value in investigating measures to increase competitive pressures within the constraints of small markets (Chapters 5 to 7).

Problems often arise in service transactions because consumers find it hard to judge service quality before or after purchase and to find remedies for poor service quality. This often prompts government regulation, particularly where there are substantial consumer welfare or public safety concerns. But regulation can limit productivity growth, by restricting firms' choices of inputs, production methods and the products they can sell. The balance between regulatory objectives and boosting productivity needs to be considered on a case-by-case basis.

Services transactions are information-intensive and sometimes subject to higher spatial transaction costs than goods transactions. ICT is the most salient general purpose technology of the late twentieth century and early twenty-first century and has particular applicability to service industries (Chapter 8).

ICT use contributes to productivity growth in service industries in many ways. It enables firms to use real-time information to design more efficient business processes and to adopt new business models and organisational forms (Chapter 9).

ICT can lower the spatial transaction costs of providing services, leading to an increased market for those services and increased competition between service providers. Increased flexibility for firms in their choice of location supports the agglomeration of related firms and its associated productivity benefits.

New Zealand's small market scale and distance from world markets interact with the complexities of service transactions in ways that impact productivity. Policies affecting services need to strike a balance between other regulatory objectives and boosting productivity. They should also allow room for market-led solutions to the problems that arise from the particular characteristics of service transactions.

3 Productivity performance

Key points

- Labour productivity growth in New Zealand has been below the OECD average since the mid-1970s. A sizable productivity gap has now opened up between New Zealand and the more advanced OECD economies. There is no indication that the gap is narrowing, let alone being eliminated, relative to the OECD leaders.
- Average labour productivity in the services sector is similar to that in the primary and goods-producing sectors, but there are large differences between industries within the sectors.
- Between 1990 and 2012 labour productivity and multi-factor productivity (MFP) grew more rapidly in the services sector than in the goods-producing sector, but less rapidly than in the primary sector.
- Productivity grew strongly in some service industries in the 1990s, associated with major economic reforms and the uptake of new technologies, but this growth was not sustained in the 2000s.
- International comparisons of industry productivity performance are difficult and restricted by the lack of comparable datasets. The data that is available indicates that labour productivity growth in most New Zealand service industries was below the average of corresponding industries in a benchmark set of OECD countries between 2000 and 2007, and that many New Zealand service industries have lower productivity levels and/or growth rates compared with counterparts in Australia and the United Kingdom.
- Given the scale of the services sector, its productivity performance is critical to any closing of New Zealand's aggregate productivity gap with Australia and other leading OECD countries.

This chapter begins by describing New Zealand's economy-wide productivity performance. It then describes the productivity performance of New Zealand's services sector and of industries within the sector, and compares that performance with other OECD countries and with service industries in Australia and the United Kingdom. The sector generates about 70% of New Zealand's GDP, and is responsible for a large proportion of the nation's productivity gap relative to the OECD.

3.1 The broader context – aggregate productivity performance

New Zealand's performance lags behind the OECD

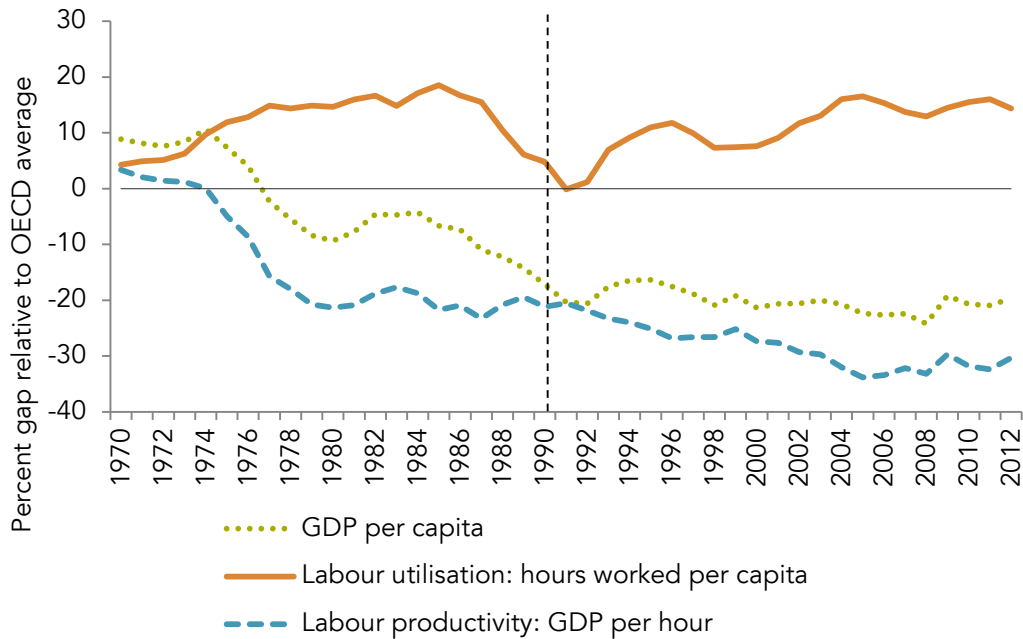
Labour productivity in New Zealand has been below the average for OECD countries since the mid-1970s, and the gap has widened during the last 40 years (Figure 3.1). More than two-thirds of OECD countries had higher average labour productivity than New Zealand in 2012 (OECD database, 2014). An hour worked in New Zealand produces 44% less output than an hour worked in the United States and about 30% less than the OECD average.

The gap is smaller when the comparison is made in terms of GDP per capita. It has not widened since about 1990, when it levelled off at about 20% below the OECD average. However, the top line in Figure 3.1 suggests that this levelling off has happened largely because the average hours worked per capita in New Zealand has grown more rapidly in New Zealand than the OECD average. This is due to New Zealand's high rate of labour utilisation, which

... results from a combination of a large share of the total population being of working age, high participation rates, low unemployment, and a high average number of hours worked per person employed relative to other OECD countries. However, the average hours worked per person employed

has fallen by around 4 percent in the five years to 2008. (MED, New Zealand Treasury & Statistics New Zealand, 2011, p. 37)

Figure 3.1 Sources of New Zealand's economy-wide GDP per capita differences, 1990–2012



Source: OECD database.

Notes:

1. Based on OECD countries with the necessary data from 1970 to 2012, namely: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.
2. To facilitate international comparison, labour productivity is measured on an economy-wide basis.
3. International comparisons are made using exchange rates adjusted to reflect purchasing power parity (PPP). PPP means that the conversion of a country's currency to \$US adjusts for the different local purchasing power of each currency. That is, conversions using \$US PPPs result in a US dollar's worth of each country's currency having the same local purchasing power.

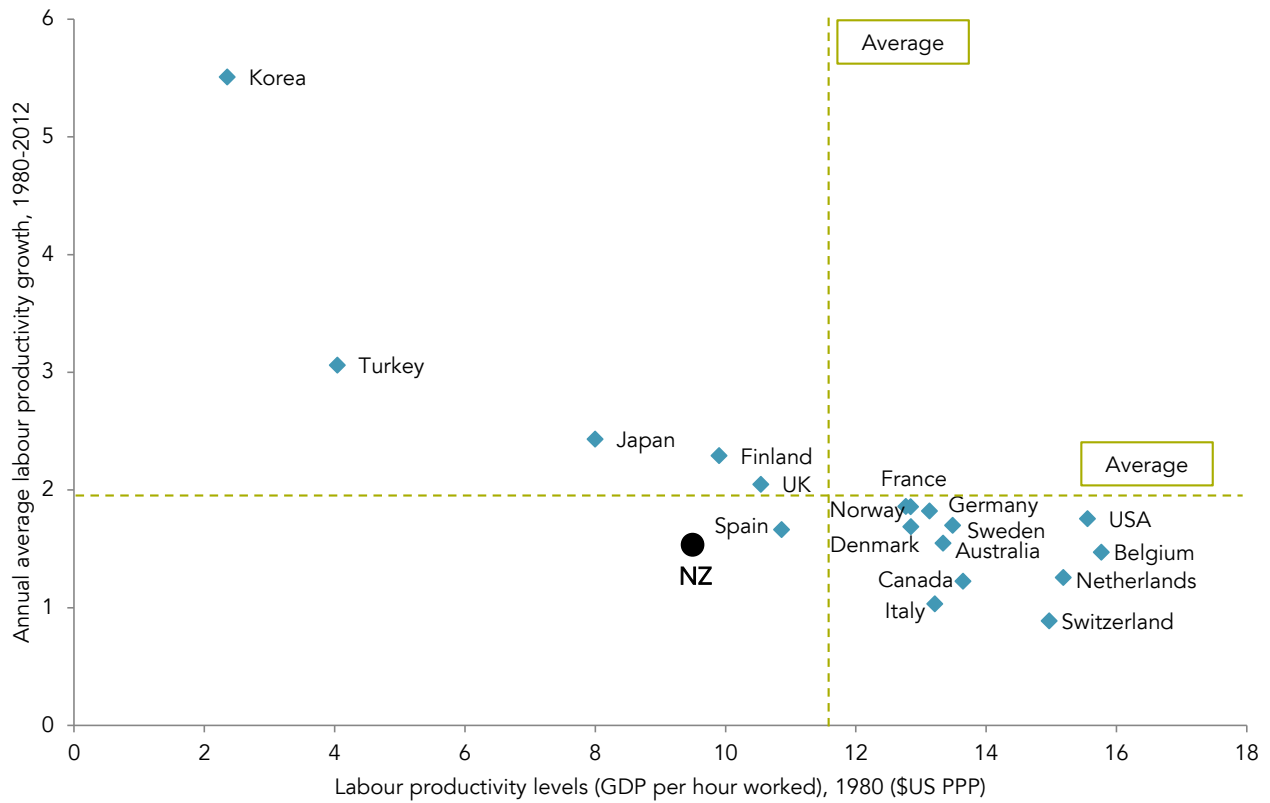
Figure 3.2 shows that in 1980 New Zealand's labour productivity was below the average for 19 OECD countries, and that only Korea, Turkey and Japan had lower labour productivity in that year (as shown by New Zealand's position along the horizontal axis). New Zealand's low position on the vertical axis shows that it is one of only two countries with below-average labour productivity levels in 1980 to have also experienced below-average growth of labour productivity since then. That is, while New Zealand's productivity growth exceeded that in countries such as Italy, Canada, the Netherlands and Switzerland, it is falling further behind, rather than catching up with, most OECD countries.

Box 3.1 Productivity measures: levels and growth rates

Section 2.2 in Chapter 2 explains the different concepts and measures of labour productivity, multi-factor productivity (MFP) and capital intensity. Analysis of productivity performance distinguishes between levels and growth rates. The two concepts are related, in that the productivity level in year t and its growth rate will determine its level in year $t+1$, $t+2$, and so on. An economy's relative productivity performance should be compared in terms of both levels and growth rates. As each can be comparatively high or low, there are four cases:

1. low level, low growth;
2. low level, high growth;
3. high level, low growth; and
4. high level, high growth.

Figure 3.2 Labour productivity levels in 1980 and growth rates, 1980–2012, in OECD countries



Source: OECD; Conway & Meehan, 2013.

Notes:

- 1. Includes OECD countries with data over the entire sample period.

F3.1

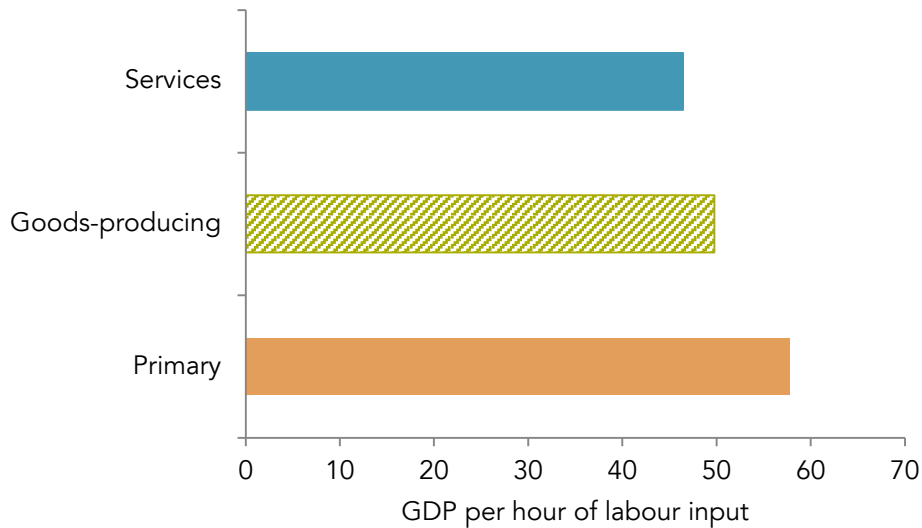
The level and rate of growth of labour productivity in New Zealand have been below the OECD average since the mid-1970s.

3.2 Sector-wide productivity

The services sector’s performance significantly influences national economic outcomes, as the sector is growing strongly and accounts for around 70% of New Zealand’s GDP (Figure 2.2). This section compares the sector’s productivity with productivity in the other two parts of the market economy: the primary sector and the goods-producing sector.

Labour productivity levels

Labour productivity in the market-provided services sector was a little under \$50 of value-added for each hour of labour input in 2011 (Figure 3.3). This was about 17% and 5% below average labour productivity in the primary and goods-producing sectors respectively. As shown later, these averages mask considerable variations between industries.

Figure 3.3 Labour productivity levels, GDP in NZ\$ per hour of labour input by sector, 2011

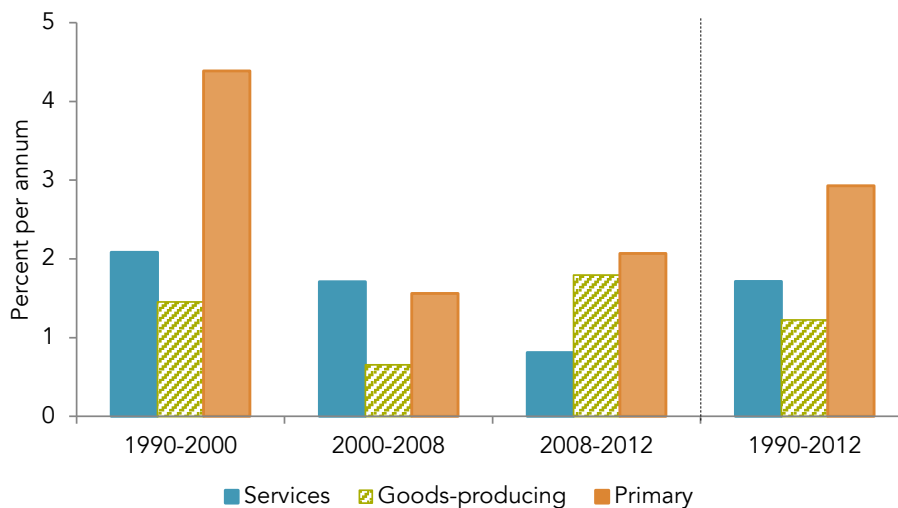
Source: Productivity Commission; Statistics New Zealand national accounts and labour hours paid tables.

Notes:

1. Statistics New Zealand bases its measure of labour input mainly on hours paid rather than hours worked. GDP per hour paid is in 2011 dollars.
2. Private residential lettings were removed from “rental, hiring and real estate” within the services sector because Statistics New Zealand is unable to measure, and so does not attribute, labour input for this sub-industry.

Labour productivity growth rates

Since 1990, labour productivity growth in the services sector has generally exceeded productivity growth in the goods-producing sector, but was slower than in the primary sector (Figure 3.4). (Appendix G, Table G.2 provides growth rates for each sector since 1978.)

Figure 3.4 Labour productivity growth rates by sector

Source: Productivity Commission; Statistics New Zealand productivity tables.

Notes:

1. Two complete cycles occurred between 1990 to 2000 and 2000 to 2008. Information on growth cycles is provided in Box 3.2

The period between 1990 and 2012 can be broken into sub-periods based on productivity growth cycles (Box 3.2). Labour productivity growth was slower in all sectors between 2000 and 2008 than between 1990 and 2000, although the slowdown was more pronounced in the primary and goods-producing sectors than in the services sector. However, since the global financial crisis (GFC), labour productivity growth has slowed much more in the services sector than in the other sectors.

Box 3.2 Choosing periods for analysing productivity performance: productivity growth cycles

When examining productivity performance over time, it is good practice to choose periods that correspond to *growth cycles*, defined as the periods between two peaks of productivity growth. Firms' use of capital and labour tend to vary within economic cycles causing corresponding variations in productivity. For example, firms typically underuse their employees and their capital stocks at low points in a cycle so that measured output falls relative to measured inputs. Measuring average productivity growth between two peaks largely removes the problem of year-to-year variations in productivity growth owing to firms varying the use of their capital and labour over a growth cycle. Table 3.1 sets out the productivity growth cycle periods used in this report.

Table 3.1 Productivity growth cycle periods

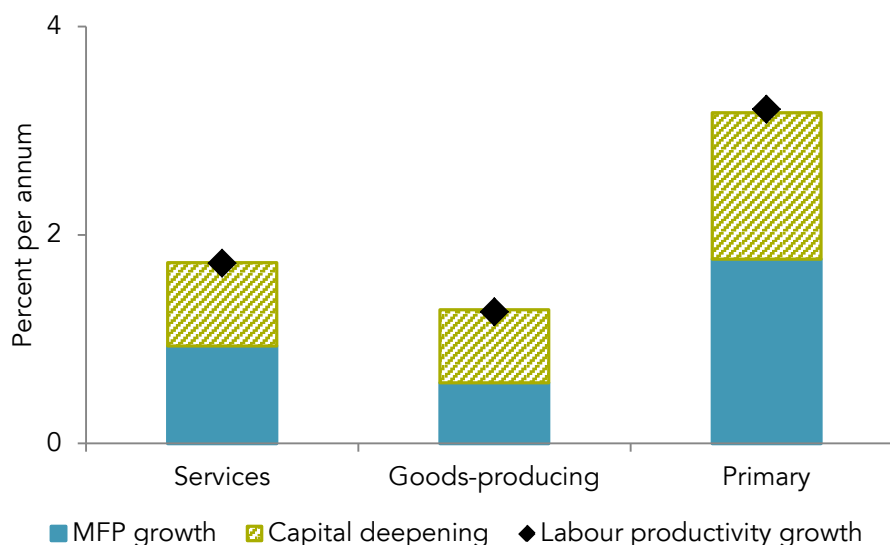
Period	Comment
1990–2012	Covers the completed growth cycles 1990–1997, 1997–2000 and 2000–2008, as well as the incomplete growth cycle 2008–2012.
1990–2000	Covers two growth cycles: 1990–1997 and 1997–2000.
2000–2008	Covers one growth cycle.
2008–2012	Covers the current (incomplete) growth cycle. This period is sometimes kept separate as the growth cycle is not complete and the period was affected by the large falls in outputs as a result of the GFC.

Source: Productivity Commission; Statistics New Zealand.

Figure 3.5 shows the relative contributions of MFP and capital deepening to labour productivity growth in the three sectors. Capital deepening generally fosters greater output because workers have more and/or better plant, equipment, buildings and infrastructure to work with. MFP is the combined effect of factors such as new knowledge and technologies, better business methods and models, greater skills and better use of them. These factors lead to higher output even when both capital and labour inputs are held constant (Chapter 2).

Between 1990 and 2012, MFP and capital deepening made similar contributions to labour productivity growth in the primary and services sectors, while capital deepening contributed significantly more than MFP in the goods-producing sector. MFP growth was strongest in the primary sector, followed by services and then the goods-producing sector.

Figure 3.5 Labour productivity growth by sector, 1990–2012, with component contributions



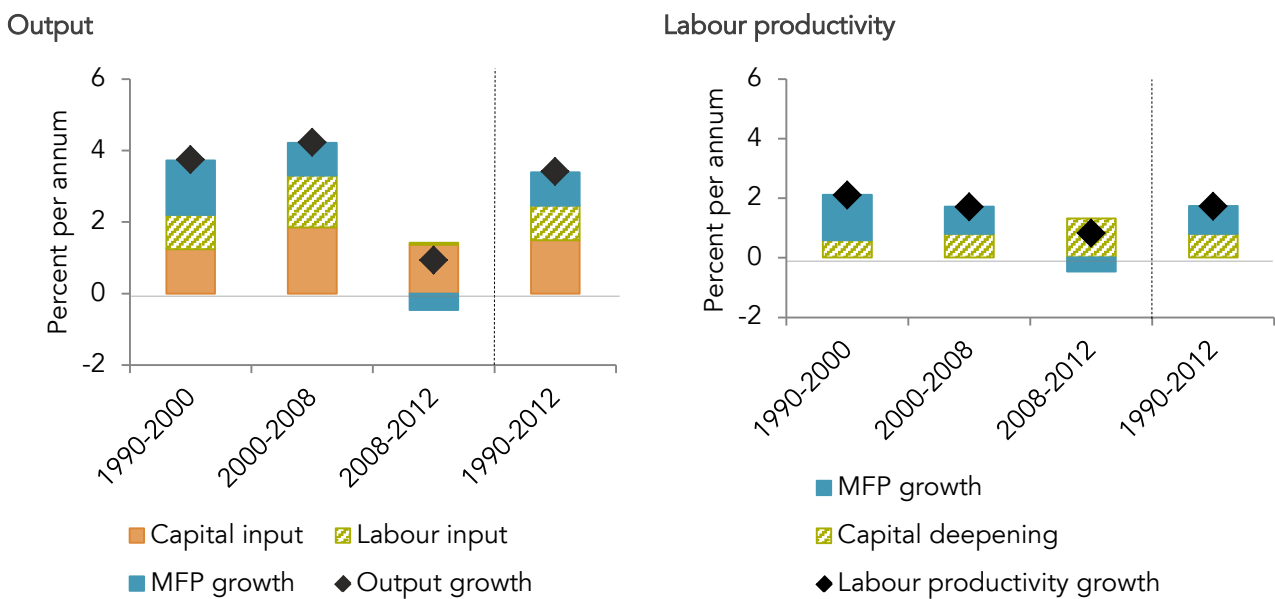
Source: Productivity Commission; Statistics New Zealand productivity tables.

Figure 3.6 shows that MFP was the major contributor to faster labour productivity growth in the services sector during the 1990s, as the economic reforms of the 1980s and early 1990s worked through the sector and as technology improved in the telecommunications and transport industries in particular. MFP growth declined between 2000 and 2008 after the effects of the earlier reforms and technology improvements had run their course.

Another contributing factor came from strong output growth between 2000 and 2008 that was associated with strong employment growth, particularly of new entrants and lower-skilled workers. Much of this employment growth happened in certain service industries such as retail trade and accommodation and food services. While this additional employment was positive for both economic and social reasons, the inexperience and/or lower skills of many of the newly employed dampened the growth of average output per unit of labour input. This showed up in lower MFP growth (New Zealand Treasury, 2008). OECD research found that differences in labour force composition and the higher share of low-skilled workers accounted for 3% of New Zealand's productivity gap with the OECD average in the mid-2000s (Bouhol & Turner, 2009).

The GFC heavily influenced output, employment and productivity growth rates in the services sector between 2008 and 2012. Initially, output, employment and MFP fell while labour productivity grew slightly. Only capital input and capital deepening continued to grow at significantly positive rates (Figure 3.6). The period is too short and atypical to take much from it in the way of underlying trends.

Figure 3.6 Services-sector output and labour productivity growth, and component contributions



Source: Productivity Commission; Statistics New Zealand productivity tables.

Notes:

- 2008–2012 is a partial productivity growth cycle.

3.3 Service industries' productivity

Labour productivity levels and growth rates vary considerably between industries within the services sector.

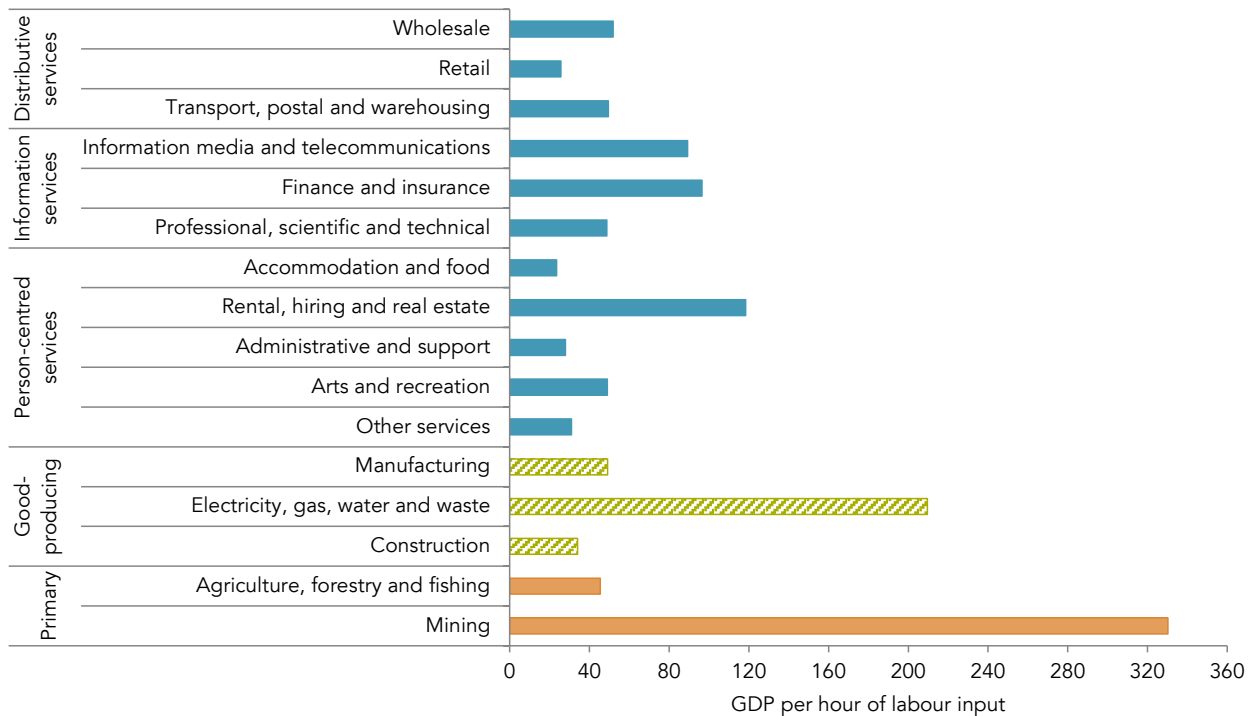
Labour productivity levels

Some service industries have the lowest levels of labour productivity in the economy, while others have comparatively high productivity. Generally speaking, distributive and person-centred service industries have lower productivity levels than most of the information-services industries (Figure 3.7). The average output per hour ranged from \$23 in the accommodation and food services industry to more than \$100 in rental, hiring and real estate services.

Industry variations in labour productivity levels reflect differences in capital intensity as well as in MFP. Service industries that invest in and use ICT intensively (such as information media and telecommunications,

and finance and insurance) have considerably higher labour-productivity levels, skill requirements and wages.

Figure 3.7 Labour productivity levels, GDP in NZ\$ per hour of labour input, by industry, 2011



Source: Productivity Commission; Statistics New Zealand national accounts and labour hours paid tables.

Notes:

1. Labour productivity levels are not shown for the education and training and the health care and social assistance industries due to differences in the method used to calculate these industries' contribution to GDP and because the large non-market parts of these industries are not within the scope of the inquiry.
2. Statistics New Zealand's measure of labour input is based largely on hours paid. GDP per hour is in 2011 New Zealand dollars.
3. Private residential lettings were removed from "rental, hiring and real estate" because Statistics New Zealand is unable to measure, and so does not attribute, labour input for this sub-industry.

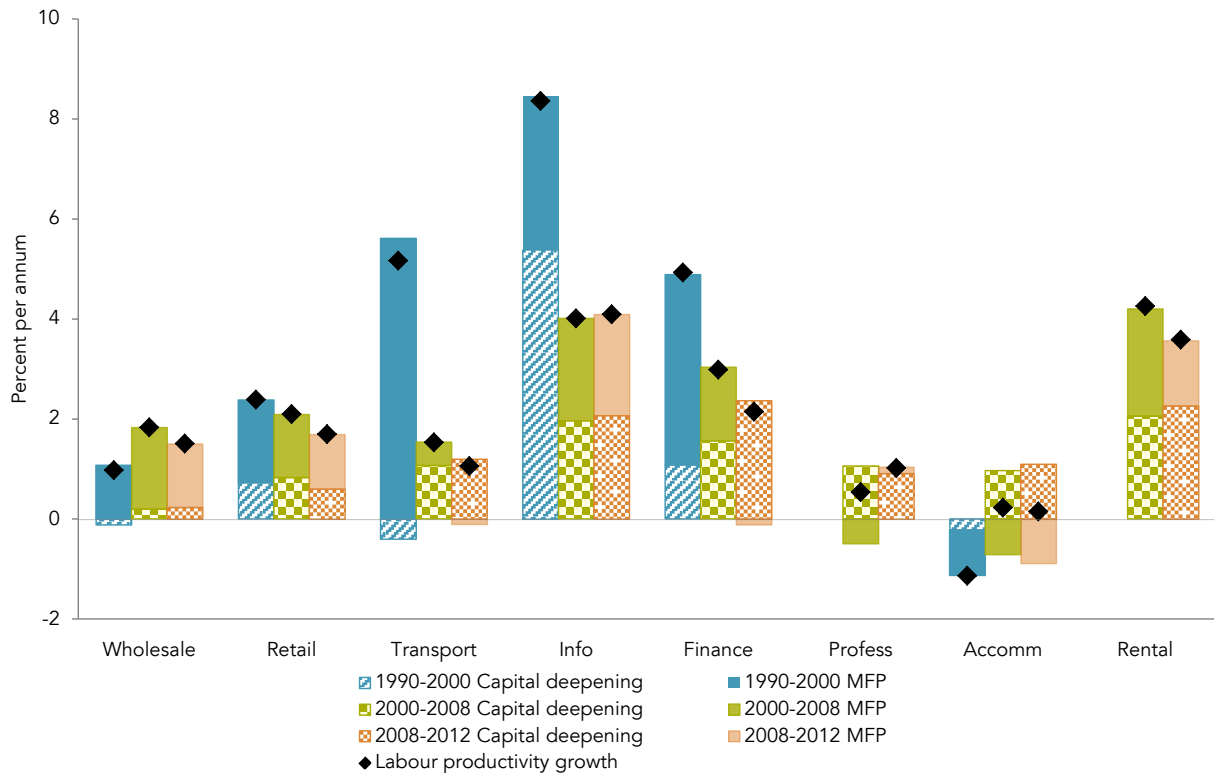
Labour productivity growth rates

Labour productivity growth rates also vary considerably between service industries (Figure 3.8) (Appendix G, Table G.3 and Figure G.1 provide details). Between 1990 and 2012, the accommodation and food industry had the lowest average annual growth rate (-0.4%), while the information media and telecommunications industry had the highest (6%), driven by MFP growth and capital deepening, particularly over the 1990s. Rapid developments in ICT and large reductions in its cost played key roles in both the MFP growth and capital deepening in this industry.²²

Following the onset of the GFC in 2008, output growth in most service industries fell sharply without commensurate falls in labour and capital inputs, leading to lower MFP growth. These special circumstances, and the fact that the period 2008 to 2012 is an incomplete productivity growth cycle, mean these figures are not reliable indicators of longer-term trends.

²² For productivity estimates, inputs and outputs are measured in physical "volume" terms. When, say, the price of computers drops so much that a firm uses 10 computers rather than 6, it might actually cost the firm less to buy the computers. But in terms of productivity measurement, the physical inputs of computers have increased.

Figure 3.8 Breakdown of industry labour productivity growth, 1990–2012, with component contributions



Source: Productivity Commission; Statistics New Zealand productivity tables.

Notes:

1. Industry productivity data is not available for most of the 1990s for the professional, scientific and technical services, and rental, hiring and real estate industries.
2. The eight industries are wholesale trade; retail trade; transport, postal and warehousing; information media and telecommunications; finance and insurance; professional, scientific and technical; accommodation and food; and rental, hiring and real estate.

Other features of the productivity growth in service industries that stand out – and possible reasons for them – are noted as follows.

- The transport, postal and warehousing industry experienced fast labour productivity growth in the 1990s (reflecting MFP growth) before a sharp slowdown in the 2000s. Reasons for the rapid growth are likely to include technological changes in transportation and regulatory reforms in air, road and rail transport, coastal shipping, ports and airports in the 1990s. The reasons for the slowdown are less clear, but may include the one-off nature of some of the effects of the earlier reforms and some deterioration in how regulation supported competition and investment in infrastructure (NZPC, 2012a).
- The finance and insurance industry achieved well above-average growth in labour productivity between 1990 and 2012 (3.7% a year), and growth was particularly strong in the 1990s. MFP and capital deepening both contributed until the GFC in 2008, after which MFP growth turned negative. Capital deepening increased strongly between 2008 and 2012, due to rapid capital investment growth following the GFC, while labour input declined in 2009 and 2010.²³
- Labour productivity grew quite slowly in the wholesale and retail trade industries (1.4% and 2.2% a year respectively between 1990 and 2012). This is surprising given the considerable scope to apply ICT in these industries. Such industries do appear, however, to experience barriers in applying new technologies (Chapter 9).

²³ In the wake of the GFC, some commentators have questioned the current statistical approaches to measuring value added in financial services (Appendix C; Haldane, 2010).

- MFP growth and capital deepening have been weak in the accommodation and food industry. Between 1990 and 2012, MFP declined by 0.8% a year and capital deepening grew by only 0.5% a year, so that labour productivity growth declined by -0.4% a year. Until 2008, employment in the industry grew strongly.
- Labour-productivity and MFP growth rates in the professional, scientific and technical services industry were low, averaging around 0.7% and -0.3% a year respectively between 2000 and 2012. Appendix C describes the methods used to measure outputs in this industry.

F3.2

The productivity performance of New Zealand service industries is diverse. Service industries are among the most and least productive in the economy in terms of both levels and growth rates of labour productivity.

F3.3

Industry variations in labour productivity levels reflect differences in capital intensity as well as in multi-factor productivity (MFP). Service industries that invest in and use ICT intensively (such as information media and telecommunications, and finance and insurance) have considerably higher labour productivity levels, skill requirements and wages.

F3.4

The distributive and person-centred service industries generally have low output for each hour paid, have experienced low labour productivity growth, and employ less-skilled people.

F3.5

Both MFP growth and capital deepening contributed to labour productivity growth across service industries between 1990 and 2012. MFP growth was generally the more variable and significant of the two.

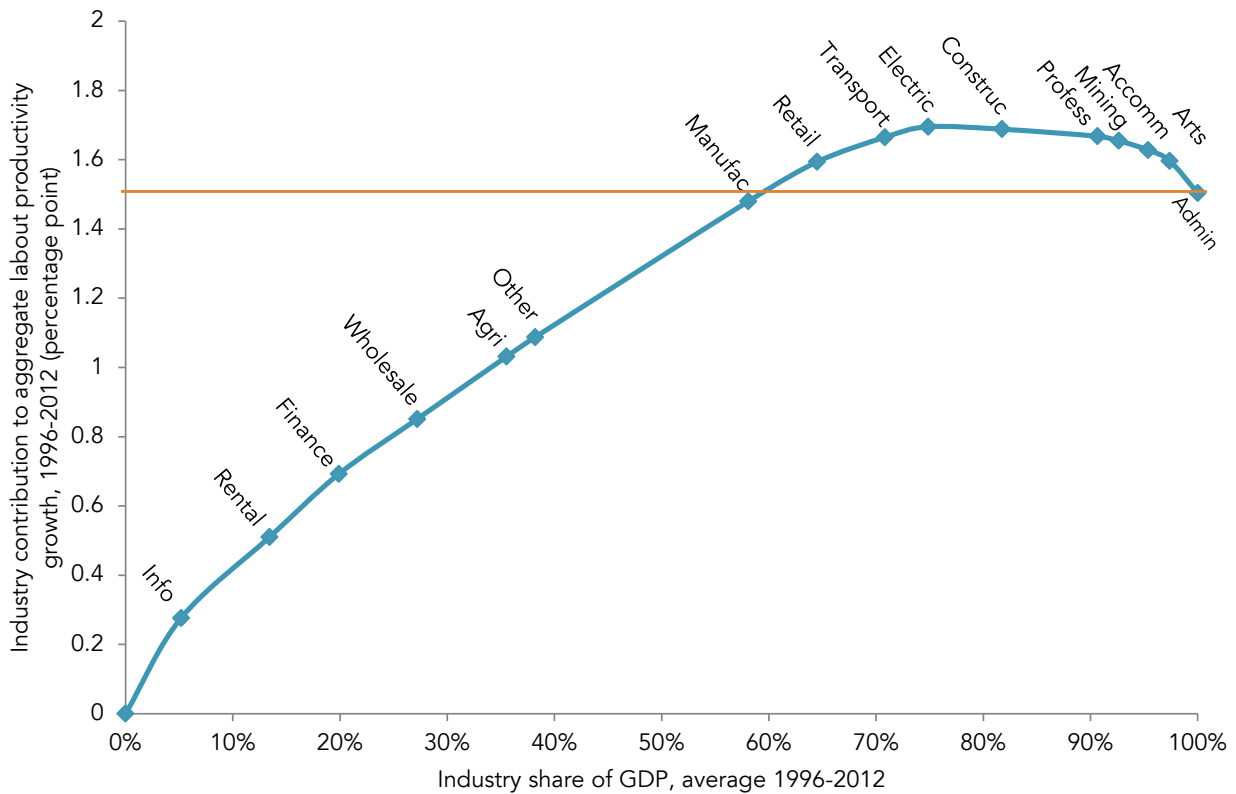
3.4 Contributions to aggregate productivity growth

An industry's contribution to the economy's aggregate productivity performance depends on its productivity performance and size. The faster its productivity growth relative to the average, and the larger its size, the larger will be its contribution. Service industries are represented at both ends of the range of industry contributions to aggregate labour-productivity growth. Even greater diversity characterises industries' contributions to overall MFP growth (Conway & Meehan, 2013).

Figure 3.9 shows that between 1996 and 2012, industries that accounted for only about 40% of GDP (information through to agriculture in the figure) contributed about 80% of aggregate labour-productivity growth (1.1 of 1.5 percentage points). The largest contributions relative to size came from the information media and telecommunications and finance and insurance industries, which accounted for only around 10% of GDP but contributed half a percentage point (about 35%) of aggregate labour-productivity growth.

At the other end of the spectrum, the negative slope of the line to the right of the mining industry in Figure 3.9 shows that the construction industry and four low productivity-growth service industries have detracted from aggregate labour-productivity growth. Among these is the professional, scientific and technical services industry, which is large – about 8% of GDP – and subtracted almost a tenth of a percentage point per year between 1996 and 2012 from New Zealand's aggregate labour-productivity growth. Administration and support services, although a smaller industry, subtracted almost as much from aggregate labour-productivity growth.

Figure 3.9 Cumulative industry contributions to aggregate labour-productivity growth, 1996–2012



Source: Conway & Meehan, 2013.

Notes:

1. Industries are ordered by industry contribution divided by share of GDP.
2. The industry contribution is estimated using the methodology developed in Parham (2012). This involves calculating labour productivity growth using separate indexes for output and labour input rather than a simple weighting of industry labour productivity growth weighted by GDP share.
3. GDP is the GDP arising from all the industries shown; that is the industries in Statistics New Zealand's official productivity statistics.

3.5 International comparisons

Limited data makes international comparisons difficult

Measuring the outputs and productivity of service industries is challenging enough within a country (Appendix C), but making international comparisons is even harder. National statistical offices sometimes use different definitions and methods, and translating prices in one currency to prices in another that takes account of differences in purchasing power further complicates international comparisons.

Limited data availability has also restricted the Commission's ability to assess the productivity performance of New Zealand's services sector against OECD and other small open economies (as the inquiry terms of reference require). For example, New Zealand is not part of the EU KLEMS Growth and Productivity Accounts database, which is a leading source of industry-level productivity information across countries, and the OECD has not yet included New Zealand in its industry productivity database.

However, Statistics New Zealand has recently estimated industry productivity statistics using the same classifications and similar methodology to that used by the OECD (see Appendix G, Table G.4). This has enabled the Commission to compare the productivity growth rates of New Zealand's service industries with their counterparts in some other OECD countries.²⁴

The Commission has also drawn on two studies to compare productivity levels and growth rates of industries in New Zealand, the United Kingdom and Australia. Mason and Osborne (2007) compared

²⁴ The Commission thanks Statistics New Zealand for providing these estimates.

New Zealand and UK industries over the period 1995 to 2004. The Commission joined with the Treasury and the Ministry of Business, Innovation and Employment, to fund a similar study comparing New Zealand and Australian industries between 1997 and 2010 (Mason, 2013). Both studies use New Zealand industry PPPs commissioned from the Groningen Growth and Development Centre at the University of Groningen.

The lack of an internationally consistent dataset that includes New Zealand hampers productivity analysis. Including New Zealand in the OECD's industry productivity database would generate significant benefits, by making comparative data available to international researchers and policy analysts and facilitating the inclusion of New Zealand in comparative studies.

F3.6

New Zealand's non-inclusion in the OECD's industry productivity database limits opportunities for research that would yield evidence and insights of benefit to New Zealand.

R3.1

Statistics New Zealand should work with the OECD to include New Zealand in the OECD industry productivity database.

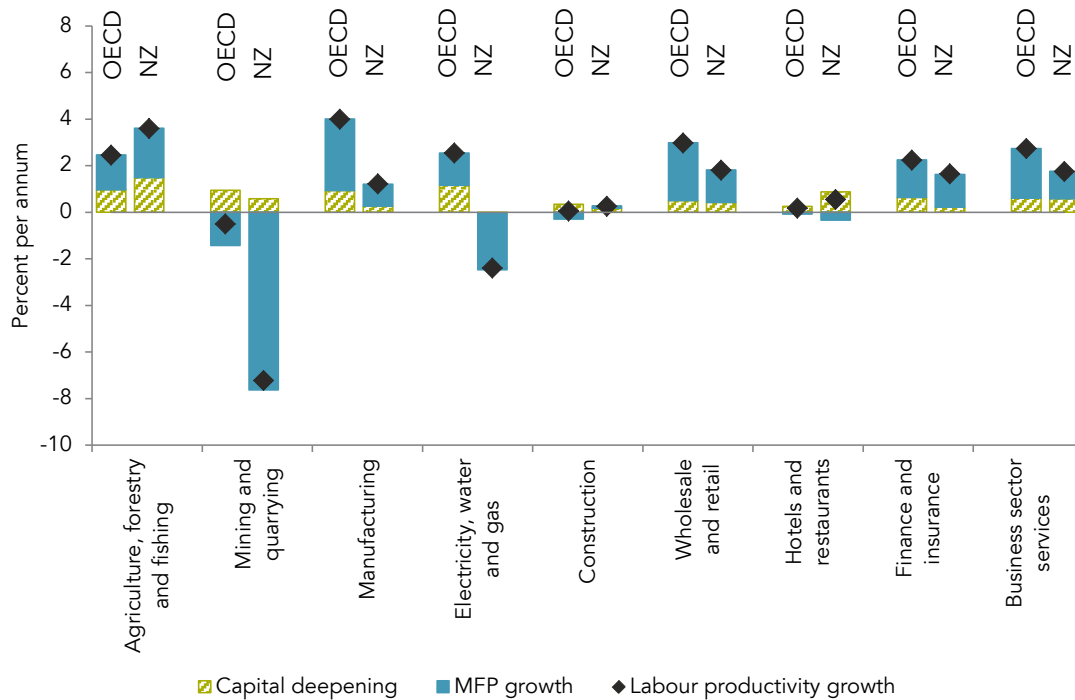
Productivity growth comparisons with selected OECD countries

Between 2000 and 2007, labour productivity growth in most New Zealand service industries was below the average of the other 10–13 OECD countries for which data is available (Figure 3.10). This is consistent with the decline in New Zealand's economy-wide labour productivity relative to other OECD countries (Figure 3.1).

The four categories at the right of Figure 3.10 are service industries. The last – *business sector services* – groups nine service industries, many of which supply inputs to other businesses.²⁵ New Zealand's relative underperformance in business sector services, shown in Figure 3.10, is also reflected in its labour productivity and MFP growth rankings of 10 and 9 respectively of 13 OECD countries between 2000 and 2007 (Figure 3.11).

²⁵ The grouping consists of the following nine ANZSIC06 industries: wholesale trade; retail trade; transport, postal and storage; information media and telecommunications; financial and insurance services; professional, scientific and technical services; accommodation and food services; rental and hiring (excluding real estate); and administrative and support services.

Figure 3.10 Growth of labour productivity, MFP and capital deepening, OECD average and New Zealand, 2000–2007

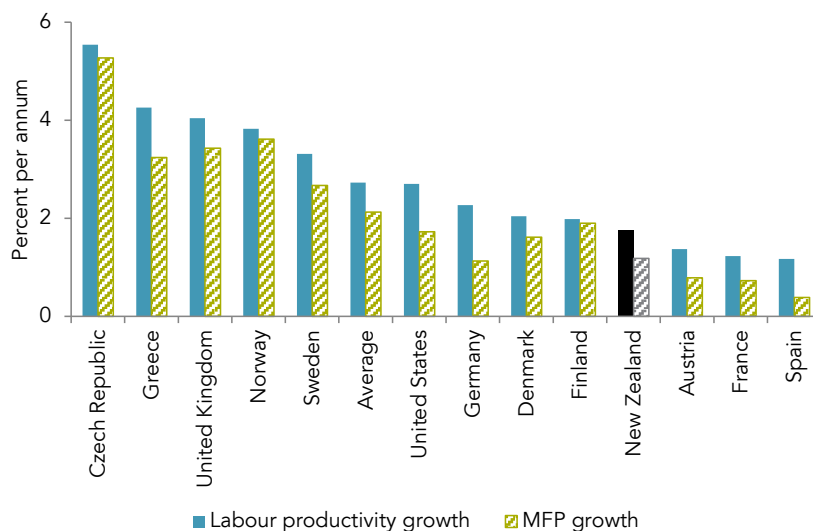


Source: Productivity Commission; OECD; Statistics New Zealand.

Notes:

1. Data based on the ISIC Rev.3 classifications used by the OECD. Appendix D, Table D.3 details the ISIC Rev. 3 industries shown here and their corresponding ANZSIC06 industries.
2. The OECD average is the simple average of OECD countries for which service-industry data is available from 2000 to 2007. These are: Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Greece, Iceland, Italy, Norway, Sweden, the United Kingdom and the United States.
3. The number of countries in the OECD average is less for mining, finance & business services and business sector services as some countries do not have data for these industries.
4. Appendix G, Table G.5 shows New Zealand’s MFP growth by industry against the OECD average.

Figure 3.11 Labour-productivity and MFP growth in business sector services in New Zealand and the OECD, 2000–2007



Source: Productivity Commission; Statistics New Zealand; OECD productivity database.

Notes:

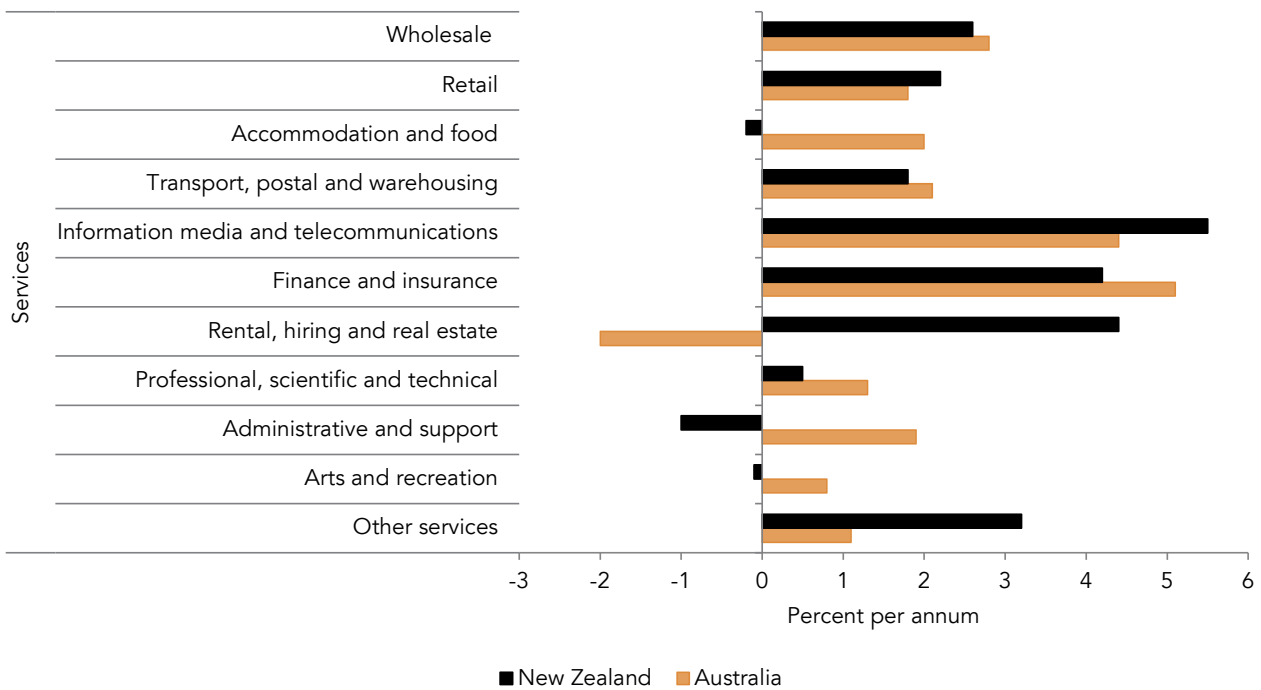
1. Appendix G, Tables G.6 and G.7 show New Zealand’s MFP growth relative to each OECD country by industry. Figure G.2 shows output and labour productivity growth decompositions for New Zealand relative to each OECD country by industry.

Productivity growth comparisons with Australia and the United Kingdom

Mason (2013) and Mason and Osborne (2007) compare industry-level productivity growth in New Zealand, Australia and the United Kingdom.

Between 1997 and 2008, in all industries covered by official productivity statistics, labour productivity grew by 2.1% per year in Australia and 1.6% per year in New Zealand. In the services sector, labour productivity grew more rapidly in New Zealand than in Australia in 4 of 11 service industries (retail trade; information media and telecommunications; rental, hiring and real estate services; and other services) (Figure 3.12). These four industries represented about 38% of the total value-added of market service industries in New Zealand in 2008,²⁶ leaving 50% where Australian industries grew faster and 12% where growth rates were similar.

Figure 3.12 Annual growth in labour productivity, 1997–2008, Australia and New Zealand



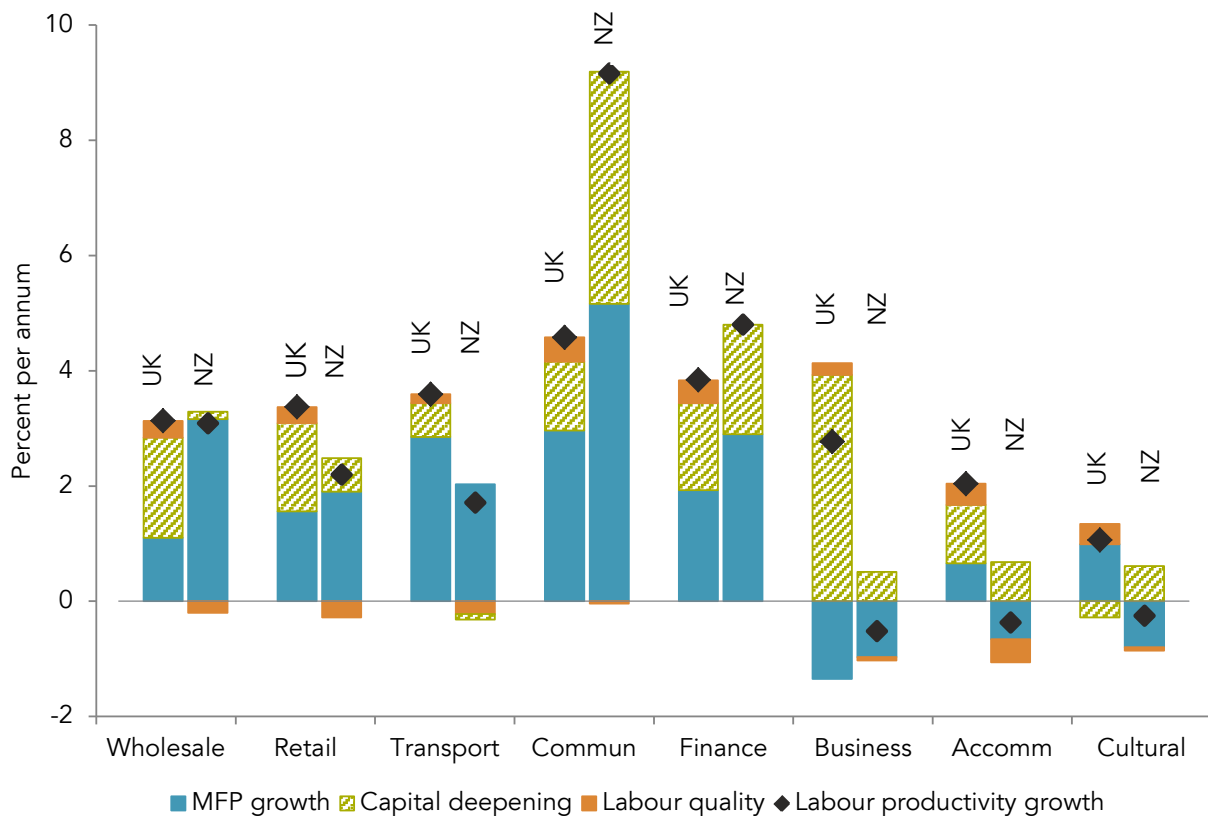
Source: Productivity Commission; Mason, 2013.

Mason and Osborne (2007) compared eight service industries in New Zealand and the United Kingdom²⁷. Between 1995 and 2004, labour productivity grew more rapidly in the United Kingdom in five of the eight service industries (retail trade; accommodation, restaurants and bars; transport and storage; business services; and cultural and recreational services). New Zealand experienced faster productivity growth in the communication services and finance and insurance industries, while growth rates were similar in wholesale trade (Figure 3.13). As in the comparison with Australia, the services in which New Zealand had faster labour-productivity growth represented less than 50% of the value-added of the market services sector in New Zealand.

²⁶ Includes private rentals in the rental, hiring and real estate industry.

²⁷ There were fewer industries for which productivity statistics were available at the time of the study. Also, the classification is different because it is based on ANZSIC96 rather than the more recent ANZIC06.

Figure 3.13 Annual labour productivity growth and component contributions, 1995–2004, United Kingdom and New Zealand



Source: Productivity Commission; Mason & Osborne, 2007.

Notes:

1. Data based on ANZSIC96 and UK SIC industry categories. The eight industries are wholesale trade; retail trade; transport and storage; communications; finance and insurance; property and business services; accommodation, cafes and restaurants; and cultural and recreational.
2. Mason and Osborne (2007) decomposed labour productivity growth into the contributions not only from capital deepening and MFP but also from labour quality by industry. This has the effect of reducing the measured MFP contribution because the effect of labour quality is normally captured in MFP.

These two studies showed that labour productivity growth rates in more than half of New Zealand's service industries were slower than in Australia and the United Kingdom. However, communications and finance and insurance (both ICT-intensive industries) were relatively good performers in New Zealand.

F3.7

Labour productivity growth has been slower in more than half of New Zealand's service industries, compared with their counterparts in Australia and the United Kingdom.

Industry productivity levels comparisons with Australia and the United Kingdom

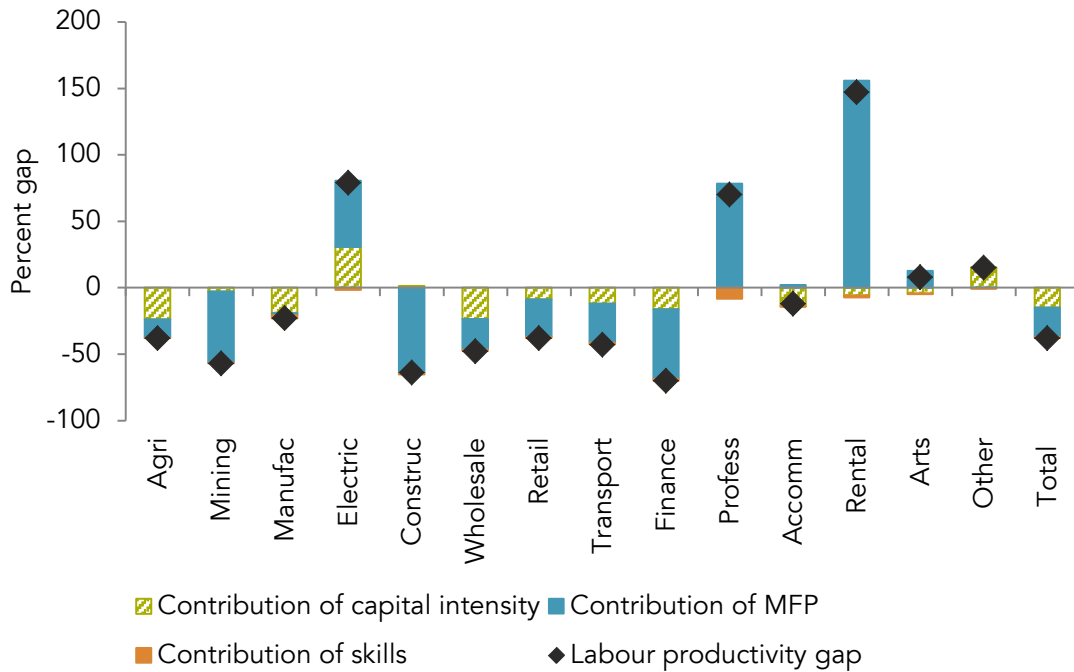
Mason (2013) and Mason and Osborne (2007) compare levels of labour productivity and MFP in market industries in New Zealand, Australia and the United Kingdom.²⁸

Mason (2013) estimated New Zealand's level of labour productivity in all market industries and in service industries as a group to be about 62% of Australia's level in 2009, down from 68% in 1997. Figure 3.14 shows the size of the gaps for each industry. It also shows how differences in the levels of capital intensity, MFP and labour quality contributed to the gaps.

²⁸ Appendix G, Figures G.2 and G.3 show New Zealand's labour productivity levels relative to Australia and the United Kingdom respectively by industry.

The last factor – labour quality – is usually included in MFP rather than measured separately. However, Mason (2013) estimated average labour quality (skills) in each industry in each country (based on educational qualifications and mean wage levels), to compare its contribution to differences in industry labour productivity levels. Across industries, New Zealand’s labour quality is similar to or slightly lower than Australia’s labour quality, but this contributed little to explaining any of the gaps.

Figure 3.14 Industry labour-productivity differences in levels, New Zealand relative to Australia, 2009, with component contributions



Source: Productivity Commission; Mason, 2013.

Notes:

- Information media and telecommunications; and administrative and support services are not shown in the graph as New Zealand and Australia have equal labour productivity levels in these industries. New Zealand’s MFP levels in these industries are higher than Australia, but these are offset by lower levels of capital intensity relative to Australia.

Mason and Osborne (2007) found that in 2004 average labour productivity across all market industries was 75% of the UK level, down from 82% in 1995. Among the eight service industries in 2002, New Zealand lagged in four industries, was ahead in three and similar in one (Figure 3.15).

Five features of the results from these two studies are worth noting.

Contributions to labour productivity gaps

Lower MFP explained the majority (57%) of New Zealand’s negative labour-productivity gap with Australia in 2009, while lower capital intensity and skills explained 39% and 3% respectively. For most service industries, MFP was the main contributor to differences in labour productivity. Where New Zealand had higher service-industry labour productivity than the other country, MFP generally contributed to this strongly. In industries where New Zealand was behind, generally both MFP and capital intensity contributed to the gap.

Capital intensity

Most New Zealand industries, including service industries, are less capital intensive than their Australian and UK counterparts and the gap has been growing. For all industries included in each study, New Zealand’s capital intensity was 62% of Australia’s in 2009 and 69% of the United Kingdom’s in 2002. The communications industry, which was more capital intensive in New Zealand than in the United Kingdom, was an exception to the general trend.

Multi-factor productivity

MFP is more variable across industries than is capital intensity. Roughly half of New Zealand's service industries had higher MFP than their Australian and UK counterparts in the relevant comparison year. When all industries in each study are aggregated, however, New Zealand's MFP was 78% of Australia's in 2009 (a slight increase from 1997), and 87% of the United Kingdom's in 2002 (no significant change relative to 1995).

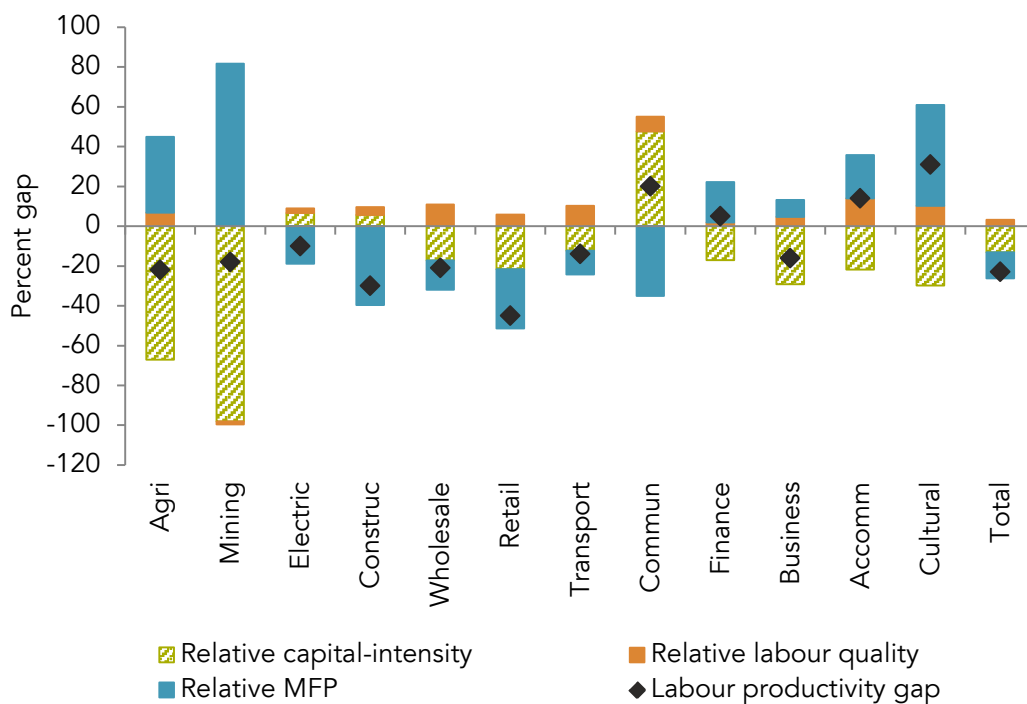
Knowledge-intensive industries

New Zealand had higher MFP in some knowledge-intensive service industries,²⁹ such as information media and telecommunications; and professional, scientific and technical services relative to Australia; and finance and insurance services relative to the United Kingdom. On the other hand, New Zealand had significantly lower MFP in financial and insurance services compared to Australia, although compositional differences reduce the significance of these results.

Distributive industries

A group of related industries – retail trade; wholesale trade; and transport, postal and warehousing – have not performed well since the mid-1990s to late 1990s. This shows in their lower labour-productivity levels compared with both Australia and the United Kingdom, and in slower labour-productivity growth rates relative to a wider group of OECD countries (Figure 3.10, Figure 3.14 and Figure 3.15).

Figure 3.15 Industry labour-productivity differences in levels relative to the United Kingdom, 2002, with component contributions



Source: Productivity Commission; Mason & Osborne, 2007.

Notes:

1. Data based on ANZSIC96 and UK SIC industry categories. Data for the manufacturing industry was not available at the aggregate level, although it is included in the total.

F3.8

There is significant variation industry by industry in productivity growth rates and levels compared with other OECD countries. But the general picture is in line with New Zealand's relatively poor productivity performance observed at the economy-wide level.

²⁹ Knowledge-intensive industries are similar to but not synonymous with ICT-intensive industries.

F3.9

New Zealand's service industries generally had relatively weak MFP growth compared with OECD countries between 2000 and 2007. MFP tended to be a greater contributor than capital intensity to New Zealand's labour productivity differences in service industries – in both growth rates and levels – compared with other OECD countries.

F3.10

The information media and telecommunications industry was an exceptionally good performer in having high levels and growth rates of labour productivity and MFP growth both relative to other industries in New Zealand, and to its Australian counterpart industry, from 1997 to 2010.

F3.11

The available evidence suggests that New Zealand's distributive service industries have underperformed relative to other OECD countries.

3.6 Lack of convergence – how have service industries contributed?

This chapter began by noting that New Zealand's productivity levels have not shown any signs of converging towards high-performing OECD economies, such as the United States and Australia. As shown in Figure 3.2, New Zealand stands out by being one of only two OECD economies with labour productivity below the OECD average in 1980 that did not subsequently achieve higher-than-average growth in labour productivity, which is necessary for a country to converge towards the leading productivity countries.

Countries with lower productivity may be able to catch up to higher-productivity countries because learning from others is typically easier than starting from scratch. Technology and knowledge transfer, through channels such as foreign direct investment and cross-border mobility of high-skilled workers and managers, enable lower-productivity countries to replicate the successful production methods, technologies, and institutions of higher-productivity countries. It also means lower-productivity countries can avoid adopting any unsuccessful production methods, technologies, and institutions in those countries (Mason, 2013). Convergence, however, is conditional on the absence of political and institutional barriers such as corruption or heavy trade restrictions. So, while there is little evidence of convergence across all countries in the period 1960–2000, convergence has been observed across countries with economic institutions above a certain quality threshold (Acemolgu, 2009; Rodrik, 2013).

The evidence presented in this chapter suggests that the labour productivity of New Zealand service industries did not converge with those in Australia or the United Kingdom over the mid- to late 1990s and the 2000s. Only 4 of the 11 service industries in the New Zealand-Australia study and 3 of the 8 industries in the New Zealand-UK study moved towards parity. Most existing industry productivity gaps between Australia and New Zealand, and half of the industry gaps between the United Kingdom and New Zealand, remained unchanged.³⁰

There is also no clear convergence pattern of New Zealand service industries towards those in the United Kingdom and Australia in terms of MFP. Where a New Zealand industry was behind at the start of the period of study, the gap more often than not remained rather than declined.

Productivity gaps across developed countries have substantially reduced in the agriculture and goods-producing industries. Much of this reduction has resulted from competition and the openness of these industries to international trade (Duarte & Restuccia, 2010).

³⁰ See Tables G.9 and G.10 in Appendix G for an analysis of convergence by industry against Australia and the United Kingdom respectively.

However, natural limitations and other barriers to trade in services have resulted in divergence in the productivity performance of service industries across developed countries. This effect and the large and growing importance of services in modern economies explain a large proportion of differences in aggregate productivity performance across OECD economies:

Low productivity growth in services is essential for understanding these [aggregate] growth experiences of stagnation and decline among rich economies. (Duarte & Restuccia, 2010, p. 162-3).

Timmer et al. (2011) provide further evidence of the importance of services productivity in explaining higher aggregate productivity in the United States versus the European Union from 1995 to 2007 (Chapter 8). As demand shifts to services in developed economies, productivity performance in the services sector affects overall productivity through two channels:

- direct – the arithmetic effect of a large and growing sector on overall performance; and
- indirect – the productivity levels in service industries, for given levels of demand, determine the resources of labour and capital needed to satisfy the demand. The higher the productivity levels, the more these resources become available for use in dynamic, high-growth parts of the economy including the export sector. Conversely lower productivity in service industries can starve the rest of the economy of these resources.

The evidence in this chapter clearly points to low productivity levels and growth rates in many service industries detracting from New Zealand's aggregate productivity performance. This is a key reason for the lack of progress towards closing New Zealand's aggregate productivity gap with Australia and other leading OECD countries.

F3.12

Weaker productivity performance in New Zealand's services sector has contributed significantly to New Zealand's lack of progress towards closing its aggregate productivity gap with Australia and other leading OECD countries.

4 The contribution of services to the New Zealand economy

Key points

- The services sector is tightly linked to the rest of the economy. There is a complex web of services that are inputs to the production of goods, and goods that are inputs to the production of services. This web interconnects the primary, goods-producing and services sectors.
- More services are purchased by firms, as inputs to their production, than by households. The primary and goods-producing sectors, taken together, spend nearly 40% more on market-provided services than on wages and salaries.
- The way that service industries are integrated into the New Zealand economy is broadly similar to comparable countries.
- The services sector supplies over half the value of New Zealand's exports when both service inputs to goods exports and direct exports by the services sector are taken into account. Accordingly, the performance of the services sector has a major bearing on New Zealand's export performance.
- Outward direct investment (ODI) is an important way that firms can export services – particularly those that require co-location of the service provider and customer. New Zealand's ODI as a proportion of GDP is low compared with other OECD economies.
- The industrial structure of the New Zealand economy, as measured by employment shares, has undergone significant change during the past three decades. Employment growth has been stronger in industries with lower labour-productivity growth than in industries with higher productivity growth.
- The shift of employment to service industries over the last three decades had a small negative effect on aggregate labour-productivity growth and a negligible effect on MFP growth.

This chapter examines the contribution of the services sector and its relationship to the rest of the economy.³¹ First it considers how the services, primary and goods-producing sectors are interlinked (section 4.1). Second, taking account of these links, the chapter examines the services sector contribution to New Zealand's exports (section 4.2). The chapter concludes by examining the extent to which employment has shifted between the services sector and other sectors of the economy, and the effect of these shifts on productivity performance (section 4.3).

4.1 Services as part of an economic web

Services play a pervasive role in the economy. They feature extensively both as inputs to production and in final uses, the latter mainly to households. The services bought by households include those bought directly, such as entertainment, eating out and personal financial services, as well as services embodied in goods. For example, groceries purchased from a supermarket embody the transport services that delivered them to the supermarket. Also, services are used at many steps along production supply chains (Box 4.1). Submitters highlighted these interconnections between the sectors of the economy:

It is important to note the interconnectedness between sectors, ie manufacturers and farmers are dependent on efficient provision of services and a competitive services sector is in their interests and vice versa. (New Zealand Chambers of Commerce, sub. 14, p. 4)

³¹ All references to services in this chapter are to market-provided services, unless otherwise stated. The classification of industries in Section 4.1 is based on the OECD's classification of industries (see Appendix B).

The idea that services, primary and goods-producing sectors can be considered independently is flawed. (New Zealand Manufacturers and Exporters Association, sub. 6, p. 1)

...we think there is so much diversity across sectors that a value chain approach should be taken. (Aviation Industry Association of NZ (Inc), sub. 13, p. 3)

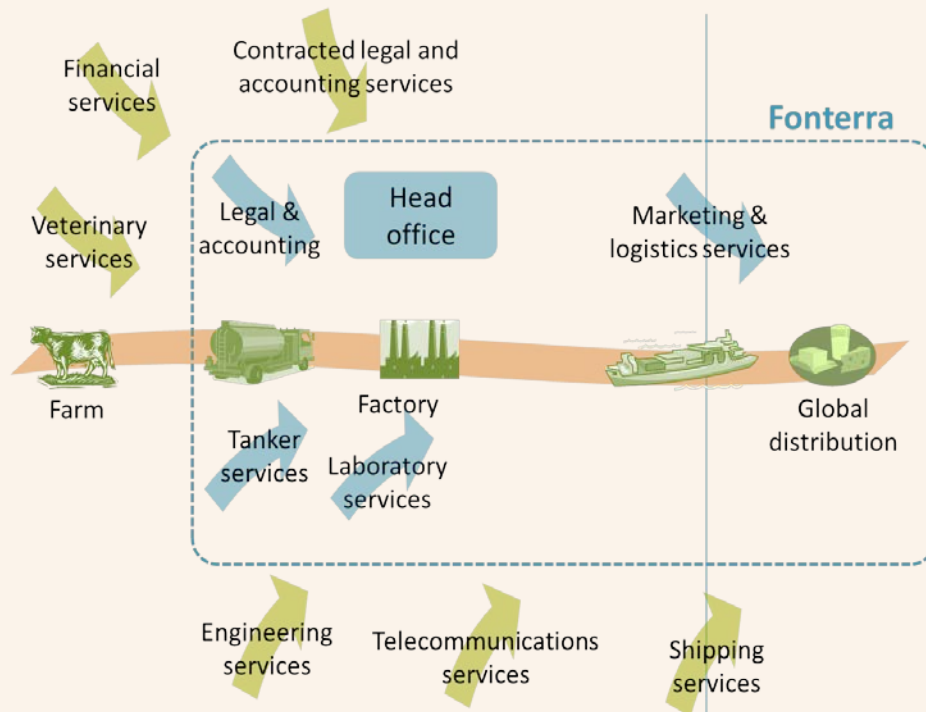
Services are very important to the agriculture sector and agriculture is very important to the services sector. (Federated Farmers of New Zealand, sub. 5, p. 3)

Box 4.1 A case study – services in the dairy industry

The dairy industry plays a significant role in the New Zealand economy. It includes dairy farming, and dairy companies processing raw milk into a range of dairy products, mostly for export. This box draws on the example of New Zealand's largest dairy cooperative, Fonterra, to illustrate how an industry mostly associated with the primary sector is both a substantial user and a producer of services.

The dairy industry has a sophisticated supply chain that runs from farms to the (mostly foreign) consumers of dairy products. Services are involved at most stages along the supply chain (Figure 4.1).

Figure 4.1 The dairy industry supply chain



The supply chain shown above illustrates how pervasive services are through New Zealand's economy. Even in an industry closely associated with the primary sector, services feature prominently throughout the supply chain.

Starting at the farm, service inputs include veterinary, financial, and other professional services. Transport services are then required to get raw milk from farms to processing factories. Fonterra owns and operates the tanker fleet that collects the raw milk, making it one of the country's largest trucking operators.

Service inputs at dairy factories include engineering services to maintain complex processing facilities, and scientific testing of products. Some of these are provided in-house and others are contracted from external service providers. Fonterra undertakes research at its own research centre located in Palmerston North and also contracts research services from domestic and overseas universities.

Fonterra's business also involves large-scale domestic and international distribution operations. Within New Zealand, logistics are involved in coordinating production and land transport of processed products with container shipping services. Fonterra is also a large-scale user of shipping services to

import and distribute inputs for the dairy industry, such as palm kernel feedstock, chemical ingredients and plastics. Fonterra is now using its Kotahi joint venture to coordinate these logistics operations with some other major New Zealand users of domestic transport and international containerised shipping services (Commerce Commission, 2012a).

Offshore, Fonterra also has an extensive source and distribution network, which includes sourcing from processing operations it part owns in other countries (such as Australia and Chile) and from international joint-venture partners. Fonterra's gross revenue for the year to 31 July 2012 was \$19.8 billion (Fonterra, 2012), compared with total dairy exports across the wharf from New Zealand in the year to September 2012 of \$12.7 billion. Part of the revenue stream is attributable to Fonterra's offshore logistics and distribution operations.

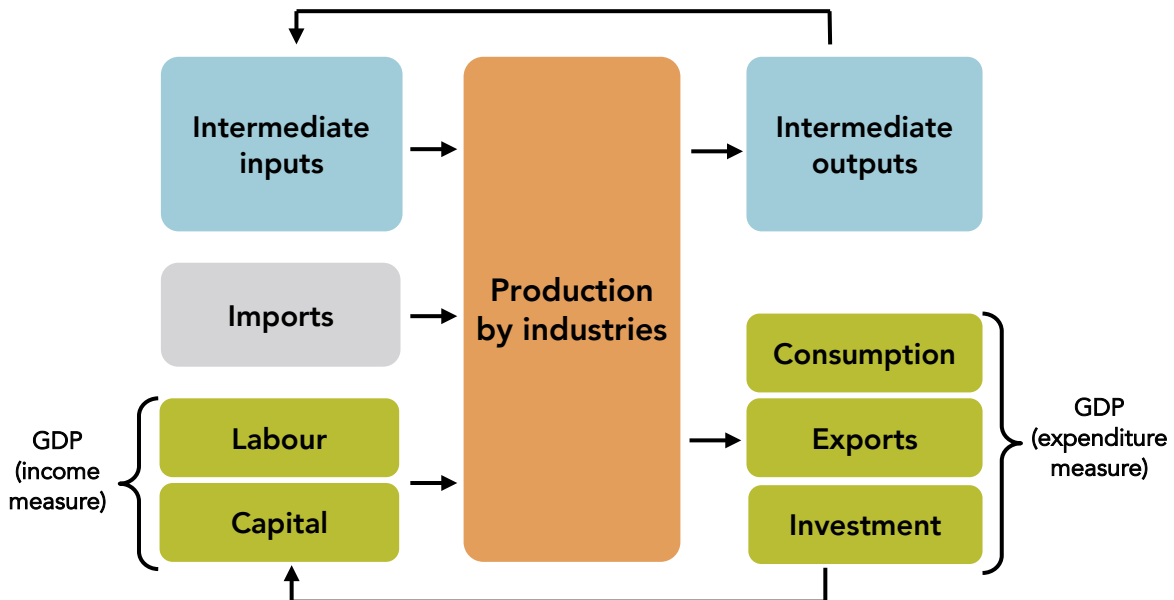
Overseeing all these operations is a head office, providing governance, financial management and marketing for the overall business. The head office also makes extensive use of externally-sourced services including legal, accounting and financial services.

Source: Information provided by Fonterra.

Input-output analysis

The Commission has conducted an input-output analysis to gain a deeper understanding of the role that services play in the economy. Figure 4.2 illustrates how such a framework can capture the flows of inputs and outputs within an economy. It shows that firms source inputs from other domestic firms and from imports, and apply labour and capital to those inputs to produce outputs. Some outputs feed back as inputs into production processes, and others are sold for final use to households, the Government, or foreign buyers (as exports).

Figure 4.2 The production process: inputs and outputs



The complete results of the input-output analysis and further details on the methodology are contained in Appendix H. The analysis highlighted some key structural characteristics of the New Zealand economy.

- More of the output of the services sector is used as inputs to production by firms than is consumed by households. Of the total gross output of the services sector in 2011/12, nearly half was used as inputs into later stages of production, around 30% was consumed by households, and the remainder accounted for through exports, investment and government consumption.

- Service inputs comprise a correspondingly sizeable proportion of the total inputs used by the primary and goods-producing sectors. In 2011/12, these two sectors together spent nearly 40% more on market-provided services than on salaries and wages.³²
- The services sector is a large user of its own output. Service firms spent a total of \$48 202 million on other services in 2011/12. The value of these services amounts to more than the cost of labour employed in the sector. A sizeable proportion of these intra-sector input-output transactions occur in distribution chains (the wholesale and retail trade, and transport and storage industries).

F4.1

The services sector is tightly linked to the rest of the economy. There is a complex web of services that are inputs to the production of goods, and goods that are inputs to the production of services. This web interconnects the primary, goods-producing and services sectors.

F4.2

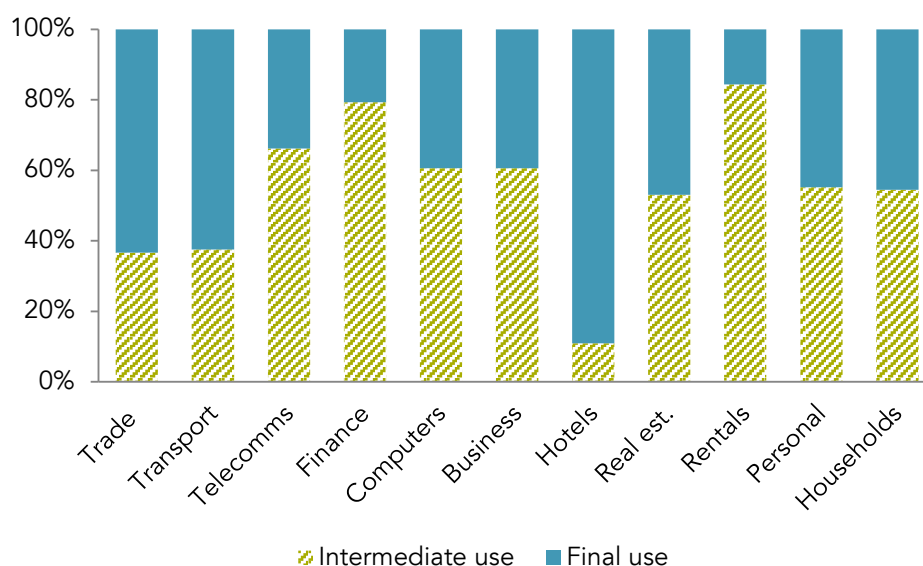
Nearly half of the outputs of the services sector are purchased by firms for use as inputs to their production. Firms purchase more services than households.

A closer look within the services sector

This section takes a more granular look at how the services sector is integrated into the wider economy.

Figure 4.3 splits the output of each service industry into its use as an input for further stages of production or final use. Over 50% of the output from each of the information industries is purchased by other firms, suggesting that these services are particularly important to the functioning of businesses. As might be expected, most output from the hotels and restaurants industry is for final use.

Figure 4.3 The output of service industries: intermediate and final use, 2012



Source: NZIER.

Notes:

1. Industry classifications are those of the OECD. See Appendix B for definitions.
2. The "personal" industry comprises firms that provide personal services to households, while the "households" industry comprises services that households (including people who work from home) provide.

³² The inputs of market-provided services that the primary and goods-producing sectors used in 2011/12 amounted to \$5 200 million and \$21 843 million, while their respective expenditures on wages and salaries were \$3 049 million and \$16 525 million.

How does the contribution of New Zealand's services sector compare with other countries?

Table 4.1 provides a snapshot of the contribution of the services sector to the New Zealand economy, relative to Australia, Denmark and the United Kingdom.

Table 4.1 Contribution of market-provided services to the economy, selected countries

Country	Services sector share of GDP (%)	Services sector output used as intermediate inputs (%)	Services exports as a share of services sector output (%)
United Kingdom	54.7	52.0	9.5
Denmark	48.4	44.9	12.9
Australia	43.0	55.5	5.4
New Zealand	50.7	48.3	7.0

Source: NZIER.

Notes:

1. New Zealand data is from 2007. The data for other countries is from the early and mid-2000s.
2. All figures refer to market-provided services.
3. Table 4.1 should be treated with caution due to different approaches to data classification between countries and because the New Zealand data is more recent than that of the other countries.

This data suggest that the relationship of the services sector to the rest of the economy in New Zealand is broadly similar to other economies.

Services comprise a smaller proportion of total exports in New Zealand than Denmark and the United Kingdom, but are a greater proportion of exports than in Australia. The larger shares for Denmark and the United Kingdom reflect that these countries are large exporters of transport services (the Maersk shipping line is headquartered in Denmark) and of financial services respectively.

The integration of industries can also be measured by a forward concentration index.³³ This index provides a measure of the breadth and depth of an industry's provision of intermediate inputs to the wider economy. An index level of zero for an industry indicates that all its output goes to final use; none is used as an intermediate input. High index numbers indicate that other industries widely use an industry's output and/or that the output goes through multiple stages of production before reaching final use.

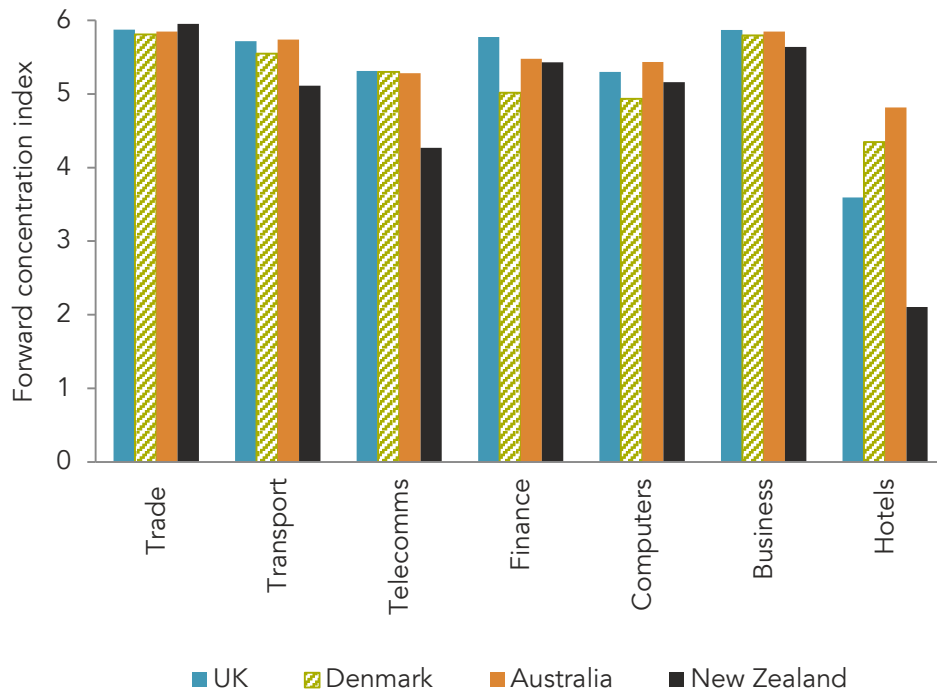
The forward concentration index for New Zealand and some comparator countries is shown in Figure 4.4. Index readings are similar for most industries, although New Zealand's hotels and restaurants, transport and storage, and post and telecommunications industries are somewhat less integrated. Lower integration in the hotels and restaurants industry may stem from New Zealand's geography (small and internationally distant, resulting in fewer business trips with overnight stays). The reasons for the lower integration in the transport and storage, and post and telecommunications industries are less evident.

F4.3

The way that service industries are integrated into the New Zealand economy is broadly similar to comparable countries.

³³ The forward concentration index estimates integration by calculating the breadth of an industry's customers. For details of the methodology see Claus et al. (2009).

Figure 4.4 Forward concentration index, selected service industries, selected countries, 2006



Source: NZIER.

Notes:

1. Data based on the ISIC Rev.3 classifications used by the OECD.

4.2 The contribution of services to exporting

Exports matter a great deal for New Zealand. The small size of the domestic economy means that the ability of businesses to access customers in overseas markets is critical if they are to grow, achieve economies of scale and specialise in areas of comparative advantage. As the New Zealand economy becomes increasingly services-based, it is timely to consider the contribution that services are making to the export economy.

Chapter 2 introduced five modes by which services can be traded over distance. This section examines the nature and extent of New Zealand's service exports via these modes.

Mode 1: Direct trade, where a service flows from one location to another; for example, banking or architectural services provided over the internet.

Mode 2: Consumer travel, where a consumer travels to another location to obtain a service; for example, tourism.

Mode 3: Commercial presence involves a service supplier establishing a permanent presence in another location to provide the service; for example, a hotel chain.

Mode 4: Supplier travel, where an individual service provider temporarily travels to provide a service; for example, consultancy services provided by an individual out-of-town, or in another country.

Mode 5: Services embodied in goods, where a significant proportion of a good's value is created by services, and that good is transported from supplier to consumer.

New Zealand's service exports

Table 4.2 shows New Zealand's exports of goods and services for 2011/12.

Table 4.2 Exports of goods and services, 2011/12

Export category	\$m	% of total exports
Goods exports	48 358	77.7
Direct services exports ¹	13 874	22.3
Total exports	62 232	100.0

Source: Statistics New Zealand balance of payments data series.

Notes:

1. The services classified as direct exports are those via modes 1, 2 and 4.

Services comprised less than a quarter of total direct exports. BusinessNZ notes that that this share is significantly less than the services sector's share of GDP:

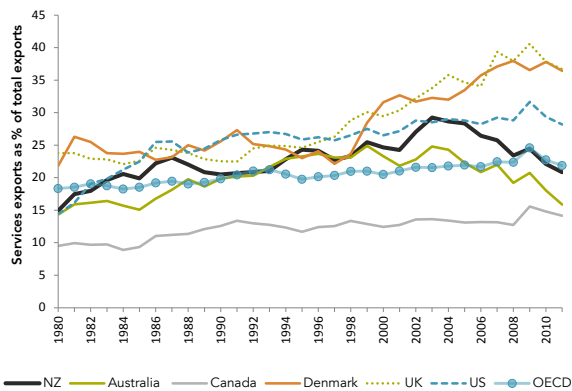
The total services sector (private + public contribution) accounts for around 70% of New Zealand's GDP. However, it represents roughly 25% of our exports. To deliver on the Government's goal of growing the proportion of exports to GDP from 30% to 40% by 2025, there will have to be substantial growth in services exports (sub. 9, p. 1).

Table 4.2 includes service exports where the service crosses the border and where a service provider travels temporarily to another country to provide a service (modes 1 and 4). It also includes services that are consumed by foreigners who have travelled to New Zealand (mode 2). A feature of New Zealand's service exports is that mode 2 accounts for a relatively high share of service exports – primarily due to New Zealand's relatively large tourism industry.

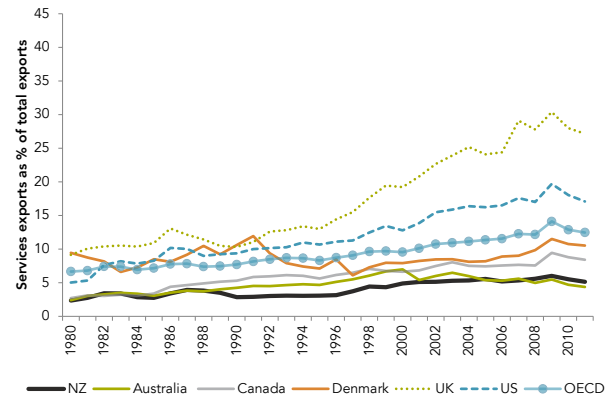
The services share of New Zealand's exports is in line with the OECD average (Figure 4.5). However, New Zealand's share of service exports other than travel and transport is low compared with the OECD average. This is not indicative of a problem, as every country has its specialisations.

Figure 4.5 Service exports (% of total exports), 1990–2011

Including travel and transport



Excluding travel and transport



Source: World Trade Organisation time series on international trade.

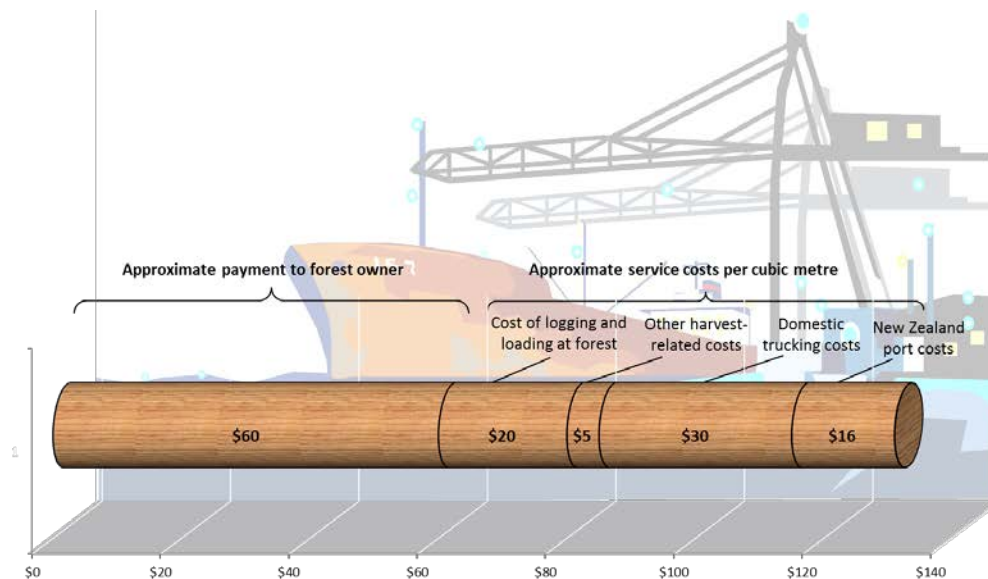
Services embodied in goods exports

By the time goods exports reach the wharf or airport, most incorporate sizeable proportions of service inputs. However, most official statistical classifications of exports (eg, Table 4.2) do not attribute exports to the full range of industries that provided those inputs. The OECD notes that

[indirect contributions] help to resolve the long-lasting paradox on why services are only responsible for, at best, one quarter of OECD exports while they account for three-quarters of value-added and employment in OECD economies. The reason is that the majority of services exports go un-noticed in official trade statistics as they are included in manufacturing exports. (2013a, p. 2)

Log exports, a relatively unprocessed commodity export, provide a compelling example. Over half the value of a log leaving New Zealand comes from services (Figure 4.6).

Figure 4.6 The services embodied in an exported log



Source: Information provided by the Ministry for Primary Industries; a New Zealand log exporter.

Notes:

1. The service costs are approximate only, and not representative of all New Zealand log exports. This example uses Lake Taupo A-grade logs (large, industrial-grade unpruned sawlogs).
2. New Zealand port costs include wharfage and marshalling of logs at the port and fumigation. Other harvest-related costs include harvesting costs and weighbridge costs. Domestic trucking costs are based on a trip from Taupo to the Port of Tauranga.
3. In the Australian and New Zealand Standard Industrial Classification ANZSIC06, logging and forestry support services are included in the primary sector. Not counting those as services reduces the services content of the value of the exported log to 35%.

The concept of services being embodied in log exports can be extended to goods exports in general. Table 4.3 shows the estimated value of services embedded in New Zealand's goods exports by industry. The total proportion of the value of New Zealand's total goods exports traceable to service inputs exceeds 45%. This estimate was calculated by tracing the service inputs to exports going back multiple stages. For example, in the case of log exports, the estimate takes account of the services used to transport logs to the wharf, and also of the services (such as accounting services) used by the trucking firms, offset by inputs sourced from the primary and goods-producing sectors (such as diesel). This process is repeated until the estimate has captured all service inputs along the production chain.

Four service industries stand out as important sources of inputs to goods exports: wholesale³⁴; transport, postal and warehousing; finance and insurance; and professional, scientific and technical.

Table 4.3 Estimates of market-provided services embodied in the value of goods exports, 2006/07

Service industry	Service inputs to goods exports	
	\$m	% of goods exports value
Wholesale	2 532	7.5
Retail	481	1.4
Accommodation and food	59	0.2
Transport, postal and warehousing	2 924	8.6
Information media and telecommunications	1 120	3.3
Finance and insurance	2 481	7.3
Rental, hiring and real estate	1 509	4.5
Professional, scientific and technical	2 865	8.5
Administration and support	961	2.8

³⁴ In these calculations, wholesale inputs incorporate only the wholesaler's margin, not the gross amount of turnover.

Service industry	Service inputs to goods exports	
	\$m	% of goods exports value
Arts and recreation	37	0.1
Other services	555	1.6
Total	15 523	45.8

Source: Statistics New Zealand National Accounts input-output tables; Infometrics.

Notes:

1. The total service inputs embodied in goods differs from that in Table 4.4 due to the use of a different data source and year.

Table 4.4 takes the analysis one step further by breaking down the inputs used on both goods exports and service exports. When combined in this way, the services sector's contribution to New Zealand's exports is more than 50%.

Table 4.4 Embodied and direct exports of services, 2011/12

	Exports (\$m)	Goods inputs (\$m)	Service inputs (\$m)
Goods directly exported	48 358	26 210	22 148
Services directly exported	13 874	3 358	10 516
Total	62 232	29 568	32 664
Embodied share of total exports		47.5%	52.5%

Source: Statistics New Zealand balance of payments data series; Infometrics.

The substantial share of service inputs in goods exports is open to alternative interpretations. One perspective is that services provide a potential source of value-add to exports. Another is that high prices for services are a cost burden. The New Zealand Manufacturers and Exporters Association capture both these interpretations:

...on occasion [services] come with a ridiculous price tag as they are not subject to the same competitive pressure as the traded economy...

As manufacturing becomes more elaborate, devices are bundled with different services to form a product. Product services can be informational or support for the products upgrade, use, repair, marketing and sale over the products life and could well involve interactions that support the products on-going development, sale and distribution (sub. 6, p. 2).

Both perspectives point to competitive markets for services being important for fostering New Zealand's export performance. Competitive service markets lessen the scope for domestic service suppliers to operate "cost-plus" business models that result in unnecessarily high input costs. Competitive service markets also help to foster the innovation that leads to more competitive and profitable exports.

F4.4

The services sector supplies over half the value of New Zealand's exports when both service inputs to goods exports and exports by the services sector are taken into account.

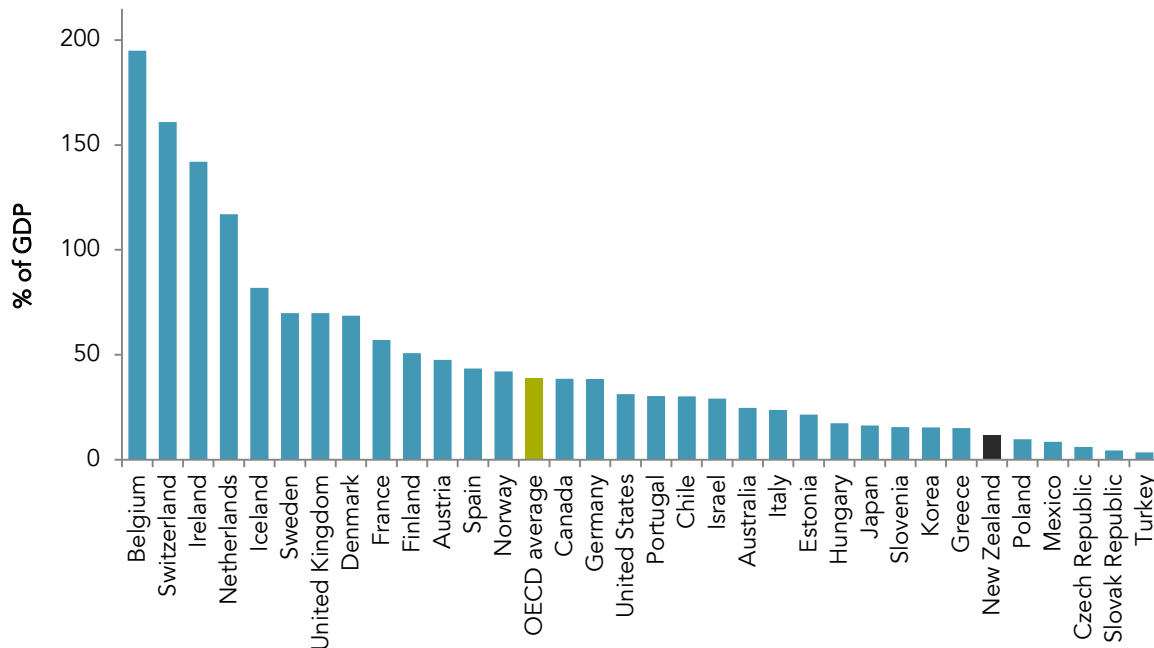
Services and foreign investment

Outward direct investment (ODI) is another mode of services exports (mode 3). ODI occurs when a firm supplies services from an establishment in a foreign market. These services are not included in the standard statistical measures of service exports. Rather, in the balance of payments statistics, the return to the capital invested in the foreign establishment is recorded as overseas investment income.³⁵

³⁵ The investment returns recorded in the balance of payments data are net returns. They exclude payments for inputs such as labour, sourced in the foreign country. By contrast, sales of services from, and within, New Zealand to foreign residents are recorded in the balance of payments in gross terms (ie, without deducting the import content of those exports).

The stock of ODI by New Zealand firms is small relative to the stock of foreign direct investment (FDI) in New Zealand. Since the mid-1990s New Zealand's ODI has typically been around 25% of FDI. New Zealand's ODI-to-GDP ratio is low compared to other OECD countries (Figure 4.7). A sizeable proportion of the FDI in New Zealand is within the services sector, and is a source of useful competition for domestic service providers. By comparison, New Zealand providers of services have little commercial presence in overseas markets. New Zealand's investment income from ODI is correspondingly small, at a little over \$2 billion in 2011/12.

Figure 4.7 ODI (% of GDP), New Zealand compared with other OECD countries, 2011



Source: OECD foreign direct investment statistics.

Notes:

1. This figure shows total ODI as a percentage of GDP. Disaggregated data for services sector ODI is not available.

F4.5

Establishing a commercial presence in foreign markets via outward direct investment (ODI) is an important channel for firms to export services – particularly those that require co-location of the service provider and customer. New Zealand's ODI as a proportion of GDP is low compared with most other OECD economies.

Service exports – performance and potential

In three respects, New Zealand has a low level of exports of services compared with other countries:

- direct service exports are relatively low when compared to OECD averages when tourism-related services are excluded (Figure 4.5);
- direct service exports are low relative to those of other small developed countries³⁶ (Meehan, 2014a); and
- service exports by New Zealand firms with an established commercial presence overseas are also low.

Direct exports

New Zealand's comparatively low levels of direct service exports can be attributed largely to high spatial transaction costs (Chapter 2) arising from its distance from overseas markets. To be internationally

³⁶ Small countries are a more appropriate comparator because larger countries typically export a smaller proportion of their total production.

competitive in providing services that require co-location of the service-provider and service-user, New Zealand firms need either to have sufficient competitive advantage to offset the cost of people travel, or to establish a presence in foreign markets.

New Zealand clearly has a competitive advantage in providing tourism services, based on its natural endowment of scenery and wilderness. The relatively low level of exports of other services, such as professional, scientific and technical services, and finance and insurance services, suggests that this is less the case for those industries.

The New Zealand Chambers of Commerce note that ICT developments are lessening the need for co-location for some kinds of service:

The growth in ICT is particularly important for New Zealand in relation to services exports. It is most significant that 86% of New Zealand's commercial services exports (including information technology, engineering, royalties, management fees, and other business services such as accounting and legal services) are exported by phone, internet or email (mode 1 services). It is these sectors becoming more internationally focussed where much of the growth potential lies. (sub. 14, p. 3)

Another view is that there are great opportunities for New Zealand to grow its exports of agricultural services. The OECD has suggested that "transferring resources towards high-value added activities that leverage off New Zealand's strong primary-industry base may hold the most promise for strengthening productivity and competitiveness" (OECD, 2013b, p. 68). In a similar vein, Oram (2008) suggests that "taking New Zealand's agriculture capital, science and skills out to the world provides opportunities to build bigger, more profitable businesses than at home". These views accord with research that indicates successful export diversification is path-dependent, building mostly on existing comparative advantage and capabilities, rather than on creating entirely new lines of exporting (Mehta & Felipe, 2013).

Exports via commercial presence

ODI is the other mode for exporting services where New Zealand stands out as having a low percentage of GDP relative to other OECD countries. Despite advances in ICT, co-location of the service-provider and service-user is still needed for many services. Where that is the case, ODI can be the most suitable mode of supply.

The Commission, in its 2012 joint study with the Australian Productivity Commission on strengthening trans-Tasman economic relations, noted that behind-the-border barriers refer

to situations where countries take different approaches to domestic regulation, which may add to the cost of doing business across the countries. Often, this arises because foreign providers are not afforded national treatment; that is, they are not treated as if they were domestic firms. Of the 28 specific initiatives considered in this study, most involve impediments to trade in services... Behind-the-border regulation looms particularly large. (APC & NZPC, 2012, p. 8)

Behind-the-border barriers to entry into foreign markets can impede ODI and the direct export of services. Barriers may include investment screening, double taxation of investment returns, and requirements for service providers to obtain professional qualifications in the host country (APC & NZPC, 2012).

Several inquiry participants noted the increasing relevance of behind-the-border barriers for New Zealand's trade negotiations:

...future negotiations [must] include all four modes of services supply and achieve to the extent possible, a liberalisation of barriers in all areas. Past negotiations have at times excluded services or had outcomes that have achieved minimal liberalisation. (BusinessNZ, sub. 9, p. 8)

...there needs to be more emphasis placed on achieving high quality trade agreements in services too. The service coverage in the China and ASEAN FTAs was pleasing but liberalisation of trade in services still lags behind that of other sectors and activities. (New Zealand Chambers of Commerce, sub. 14, p. 3)

How trade agreements link to locally supplied services and potentially services supplied by the trade partner can have a major impact on product exports. For example the Mutual Recognition Agreement associated with the China Free Trade Agreement has been a disaster and remains an open question five years since the Agreement was signed. The Agreement references factory inspection services,

special product test services and overarching compliance services that are not available in New Zealand. (New Zealand Manufacturers and Exporters Association, sub. 6, p. 5)

While the New Zealand Government can attempt to influence the barriers that other countries erect to ODI and to exports of services from New Zealand, it can more readily address the barriers that it erects (Chapter 5).

4.3 Has the shift to services affected overall productivity performance?

Shifts in employment, and in the allocation of capital, between industries are termed *structural change*. Structural change is an ongoing process as firms respond to changes in demand, prices and production technology.

Shifts between industries with different levels of productivity will affect an economy's overall productivity growth. If low-productivity industries in an economy expand relative to high-productivity industries, overall productivity growth will suffer (all other factors being equal).³⁷ Likewise, if high-productivity industries expand relative to low-productivity industries, overall productivity growth will benefit.

The impact of structural change on productivity growth is particularly evident in developing economies. Many of those economies, particularly in East Asia, experienced rapid overall productivity growth from shifts of rural labour to, and increased investment in, higher-productivity manufacturing for export markets (McMillan & Rodrik, 2011).

More advanced economies already close to the productivity frontier have much less scope to achieve substantial lifts in productivity through structural change. For these economies, the scenario that receives more attention is dampened productivity growth from a shift of resources to low-productivity service industries (Nordhaus, 2006; Baumol, 1967). Such a shift could occur from several causes. For example:

- An industry will shed resources if its productivity grows faster than does demand for its output. This is likely to be more common for industries that are limited to servicing domestic demand, for example electricity production. By contrast, exporting industries can access larger markets and benefit from demand increases elsewhere.
- The output of an industry can be constrained by limits on its essential inputs. In such cases, the industry will shed resources if its productivity grows faster than does its output. Mining companies, for example, can face input constraints through their reliance on exhaustible natural resources.
- A low-productivity industry can gain resources if demand for its output increases more than proportionately with household income.³⁸ The share of such industries in the economy may increase as income levels rise. The industries producing restaurant, accommodation and house-keeping services may fit this pattern.

Resources can shift to high-productivity industries under other circumstances. For example:

- Industries with high rates of productivity growth often experience increases in demand as a result of reductions in price of their products. For example, advances in technology have resulted in new and cheaper telephone services, which have led to a substantial increase in demand for those services. This increase in demand can offset technology-induced labour shedding.
- The output of industries servicing export markets can expand faster than the rate of productivity growth in those industries. This will draw resources into those industries. For example, resources are being drawn into New Zealand's dairy industry.³⁹

³⁷ These relationships might change if the industry groups experienced different rates of productivity growth.

³⁸ Such products are often referred to as *superior or luxury goods*.

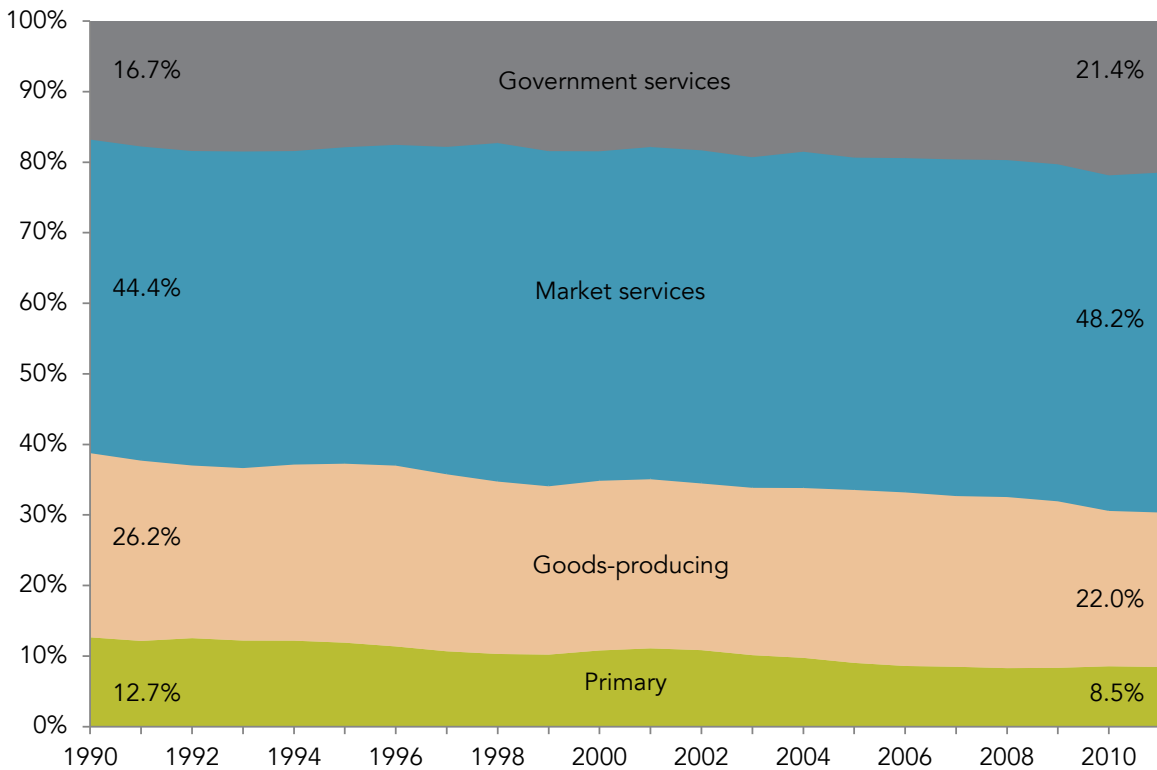
³⁹ For instance, the amount of land devoted to dairy farming is at an all-time high (LLC & DairyNZ, 2013).

These effects act in different directions, making the size and direction of the effects of structural change on an economy's productivity growth an empirical question.

The changing structure of the New Zealand economy

Structural change tends to occur gradually – albeit with periods of more rapid adjustment. It can accumulate to a sizeable shift over time. Since 1990 the services sector share of total hours paid in New Zealand increased by 9% to over 75%. Market-provided services account for four percentage points of that increase, with growth in government-provided services making up the balance (Figure 4.8).

Figure 4.8 Employment structure of the New Zealand economy, 1990–2011



Source: Productivity Commission; Statistics New Zealand labour volume series and quarterly employment survey.

Notes:

1. Sectors are based on the ANZSIC06 classification of industries, excluding owner-occupied housing.
2. Government services are local government administration, central government administration, defence and public safety, education and training, and health care and social assistance. Market services are all other service industries.
3. Shares are based on hours paid.

The 2011 level of labour productivity in the services sector was a little below that for the primary and goods-producing sectors (Chapter 3). This might suggest that the shift in the structure of the New Zealand economy towards services will have slightly dampened New Zealand's overall productivity performance.⁴⁰

On the other hand, the levels and growth rates of productivity in some service industries were among the highest in the economy, while others were among the lowest. To gauge how changes in the structure of the economy, including towards services, has affected New Zealand's productivity growth, it is necessary to consider productivity differences at a lower level of aggregation.

⁴⁰ Figure 4.8 shows that the employment shift towards government services was larger than that towards market services. The analysis in this section does not address the productivity effects of this shift for two reasons. First, there is a lack of productivity data on government services, and what is available is not directly comparable with market services. Second, the productivity of government services is outside the inquiry's terms of reference.

The Commission has considered the productivity effects of structural change at the 1-digit (industry) level of aggregation⁴¹. The results presented below are specific to that level of aggregation⁴².

Shift-share analysis of productivity performance

Employment shifts between industries are the result of a complex interplay of productivity levels, productivity growth, supply, demand, technology, regulation and prices. It is nearly impossible to separate out the effects of changes in all these factors. *Shift-share analysis* is a technique for decomposing aggregate productivity growth into two contributions.

- The *within-industry contribution* is measured as a weighted average of productivity growth rates across industries. The weighted average reflects what aggregate productivity growth would have been had the economy's structure not changed.
- The *between-industry contribution* captures the effect of changes in the industrial structure of the economy on aggregate productivity growth. The effect is positive if industries with above-average levels of productivity became a larger share of the economy, or if industries with below-average levels of productivity became relatively smaller. The effect is negative if industries with below-average levels of productivity became a larger share of the economy, or if industries with above-average levels of productivity became relatively smaller.

The shift-share analysis undertaken by the Commission is summarised in Table 4.5.

Table 4.5 Shift-share analysis of productivity growth (annual average growth rates and contributions)

1978–2011		
	Labour productivity	MFP
Within-industry contribution	3.02%	0.84%
Between-industry contribution	-0.30%	-0.02%
Total productivity growth	2.73%	0.82%
1990–2011		
	Labour productivity	MFP
Within-industry contribution	2.73%	1.00%
Between-industry contribution	-0.38%	-0.02%
Total productivity growth	2.35%	0.98%

Source: Meehan, 2014b; Productivity Commission; Statistics New Zealand.

Notes:

1. See Parham (2012) for the method used for the MFP results.
2. The data series is for the "former measured sector". See Statistics New Zealand (2012) for the industry coverage of those sectors.
3. See Figure 4.9 and the paragraph that follows it for the contributions of specific industries.
4. Column totals are not exact due to rounding.

The within-industry contributions were the main contributors to aggregate labour-productivity growth. The between-industry contributions were negative, but relatively small. The positive within-industry contribution was seven times that of the negative between-industry contribution for 1990–2011 and ten times for 1978–2011 (Table 4.5).

Decomposition of MFP growth over the same time periods shows virtually no between-industry contribution. The smaller between-industry contribution to MFP compared with labour productivity may

⁴¹ This level of aggregation is the lowest for which hours paid data was available.

⁴² In particular, an alternative shift-share analysis with industries defined more narrowly would attribute a higher proportion of productivity growth to the between-industry contribution.

have been due to a structural shift toward industries with lower levels of capital intensity. Such a shift lowers overall labour productivity growth but not MFP growth (Parham, 2012).

F4.6

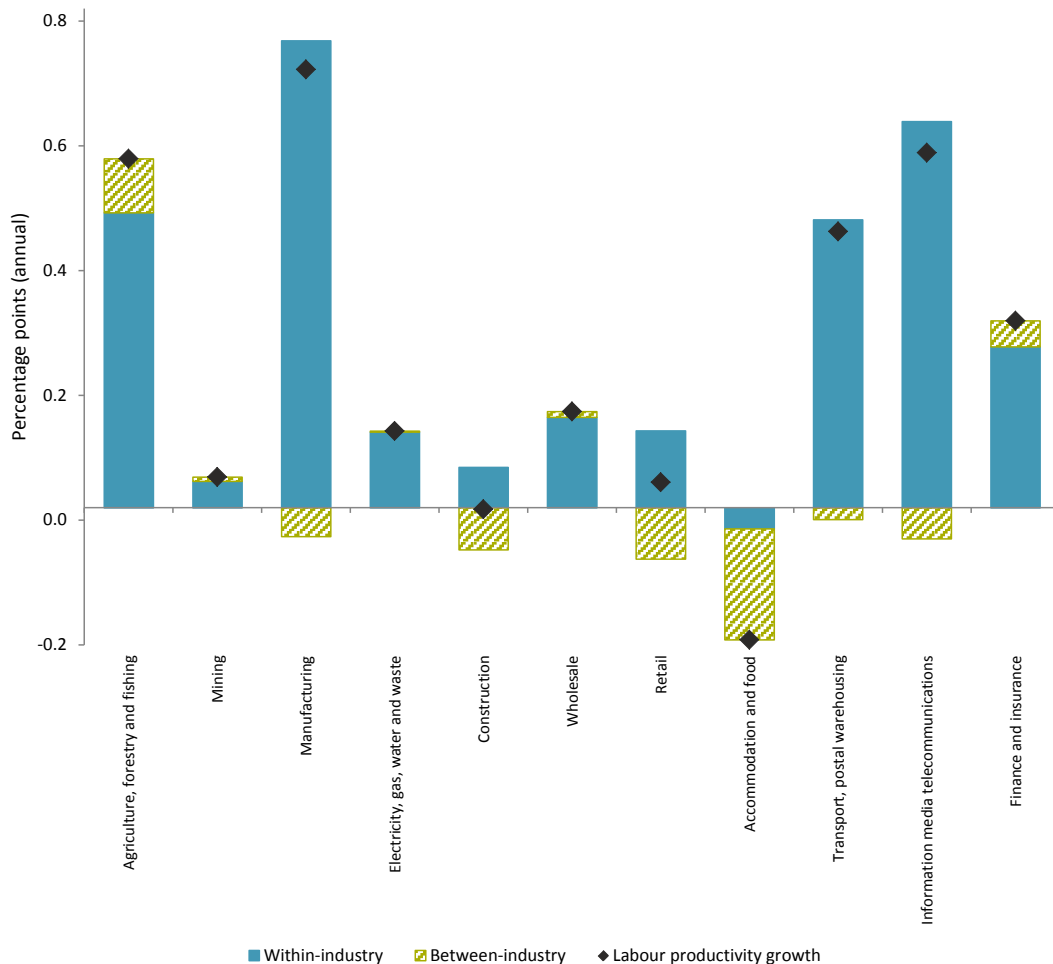
Between-industry structural change over the past three decades had a small negative effect on New Zealand's aggregate labour-productivity growth. Within-industry labour productivity growth was much more significant. The effect of between-industry structural change on MFP growth has been negligible.

A negative between-industry contribution to aggregate labour-productivity growth needs to be interpreted with some caution. Deeper analysis of the shift-share results and cross-country comparisons can assist with interpretation.

Industry contributions

Figure 4.9 provides an industry-level breakdown of the within-industry and between-industry contributions to total labour productivity growth.⁴³

Figure 4.9 Decomposition of labour productivity growth, industry contributions, 1978–2011



Source: Productivity Commission; Statistics New Zealand.

Notes:

1. The bars represent the percentage point contributions of each industry to the average annual percentage increase in labour productivity for the former measured sector.

The shift in the structure of the economy toward service industries accounts for some of the negative between-industry contribution to labour productivity growth. The retail, accommodation and food,

⁴³ A counterpart chart for MFP is not shown as the decomposition of MFP growth found virtually no between-industry effect.

transport, postal and warehousing, and information media and telecommunications industries all made such negative contributions. The retail and accommodation and food industries had below-average levels of labour productivity and accounted for a growing share of employment. The transport, postal and warehousing, and information media and telecommunications industries had high levels of labour productivity, but a shrinking share of employment. The wholesale and finance and insurance industries made positive contributions due to their above-average level of productivity and growing share of employment (Figure 4.9).

F4.7

A shift to services accounted for some of the negative between-industry effect on labour productivity growth, though shifts to wholesale trade and finance and insurance made positive contributions.

New Zealand compared with other countries

The between-industry effects of structural change on MFP growth have been very small in New Zealand and Australia, at least since the early 1990s (the period for which comparable data is available).⁴⁴

Making comparisons between New Zealand and other countries (excepting Australia) is more difficult due to differences in methodologies, data coverage and industry classifications.

Meehan (2014b) reports a shift-share analysis of labour productivity growth over the period 1990 to 2005 for 19 OECD countries, including New Zealand. The between-industry effect was positive for some countries (including Luxembourg, Greece, Italy and Spain) and negative for other countries (including the United Kingdom, Ireland, Netherlands and the United States). New Zealand had the largest negative effect as a percentage of labour productivity growth.

Meehan cautions that this result should not be interpreted as being detrimental. In particular, labour market participation and the productivity of utility industries improved in New Zealand during the same period.

- Shift-share analysis does not account for changes in labour utilisation. New Zealand experienced strong increases in labour force participation and strong decreases in unemployment in both the 1990s and early 2000s. These movements may have contributed to the comparatively large between-industry effect over this period, by bringing low-skilled and less experienced people into the workforce (Meehan, 2014b). Increased labour utilisation increases GDP per capita, and is desirable even though it may reduce measured labour productivity.
- New Zealand utilities, particularly the electricity, gas, water and waste industry, experienced dramatic increases in labour productivity during the 1990s. This is a success story driven by technology and institutional change. But because this industry's output is (largely) limited to satisfying domestic demand, improved productivity meant lower labour inputs.⁴⁵ This industry was responsible for a significant proportion of the negative between-industry effect that occurred during the 1990s (Meehan, 2014b).

These changes, positive in themselves, partly explain the comparatively large between-industry effect in New Zealand.

F4.8

The effect on labour productivity growth from employment shifting between industries, while small, was more negative in New Zealand than in other OECD countries between 1990 and 2005. This difference can partly be explained by strong growth in labour force participation and in the productivity of utility industries during the 1990s – both of which were desirable developments.

⁴⁴ Australian results are those from Parham (2012). New Zealand results are those in Table 4.5, which uses the same methodology.

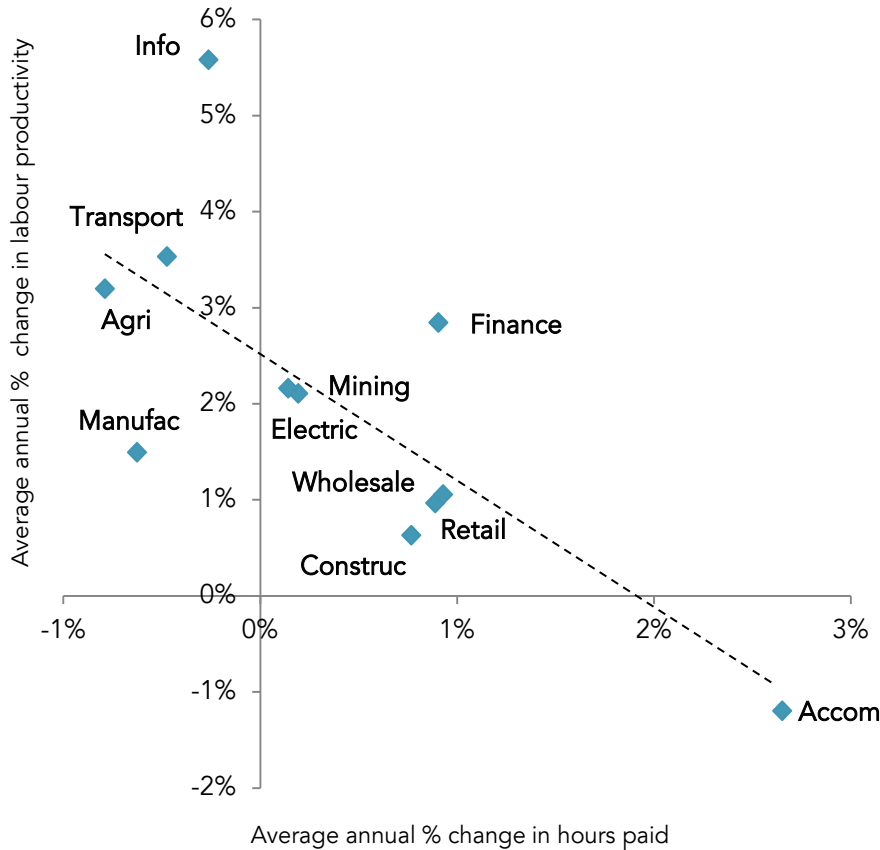
⁴⁵ Some utility outputs can be exported indirectly to satisfy international demand; such as electricity embodied as aluminium.

Labour productivity, employment and value-added

The Commission undertook further analysis to gauge the effect of changes in demand on employment shifts between industries. In this analysis, changes in demand are assumed to be reflected in changes in industry output, measured as the aggregate value-added of that industry.

Figure 4.10 and Figure 4.11 plot the employment and output growth rates for individual industries against their average rates of growth in labour productivity between 1978 and 2011.⁴⁶

Figure 4.10 Labour productivity growth and employment growth, 1978–2011



Source: Productivity Commission; Statistics New Zealand.

Notes:

1. The dotted line represents the least squares linear regression of the plotted points, and has a weighted R^2 of 0.491.
2. The relative position of industries on the Y-axis is different to that shown in Figure 4.9. This arises because the data for Figure 4.9 is weighted by the relative size of the industry.

Figure 4.10 shows that employment growth tended to be weaker in industries with strong labour-productivity growth, and stronger in industries with weak labour-productivity growth. Figure 4.11 shows that growth in value-added had no clear relationship with labour productivity growth

More specifically, these figures point to very different outcomes for different industries. Two groups of service industries stand out:

- A “high labour-productivity growth” group (information media and telecommunications, transport, postal and warehousing, and finance and insurance) had high growth in both labour productivity and value-added. The finance and insurance industry increased employment as demand expanded faster than labour productivity. Employment fell for the other two industries.

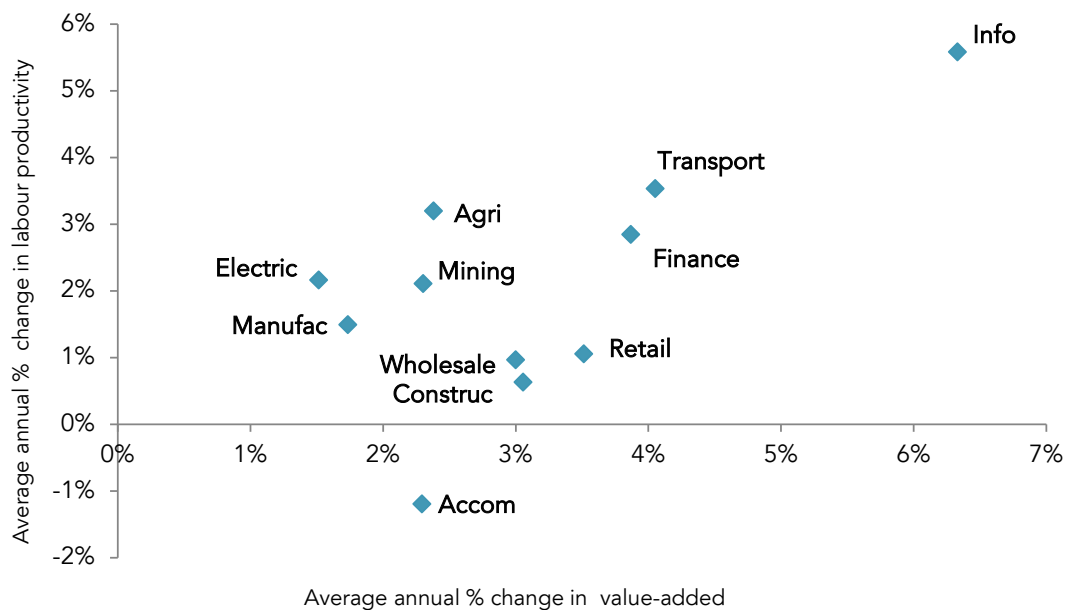
⁴⁶ The Commission also examined the relationships between changes in MFP, employment and value-added for these industries over the same period. It found the same basic relationships as reported for labour productivity.

- A “low labour-productivity growth” group (accommodation and food, wholesale and retail) had low or negative labour-productivity growth and middling rates of value-added growth. Employment grew in these industries – especially in accommodation and food.⁴⁷

This suggests that high labour-productivity growth in service industries is associated with demand growth in those industries. One possible explanation is that the productivity growth is being translated into lower prices, fuelling demand.

On the other hand, low rates of productivity in service industries do not necessarily mean low demand growth. Income effects (ie, demand for particular services rising more than proportionally with household income) are a possible explanation.

Figure 4.11 Labour productivity growth and value-added growth, 1978–2011



Source: Productivity Commission; Statistics New Zealand.

A healthy economy needs a variety of jobs to match workers' skills and preferences

Service industries vary markedly in labour productivity levels and growth rates (Chapter 3). Related to this, industries vary in dimensions pertaining to their workforce: average wages, skill levels, average ages and experience, turnover rates and ratios of part-time to full-time workers. Variability in these dimensions has a large benefit as it creates employment opportunities that better match the very mixed composition of the workforce. All economies have a spread of available skills and skill requirements; ideally the two are closely matched.

In particular, it is desirable that the low-skilled, the young, the inexperienced and those who need flexible work hours can find suitable jobs. Often these positions will be temporary, but they can provide both valuable learning experiences and stepping stones to more skilled and more permanent employment. The service industries that provide these jobs play an important function in society and in developing the careers of these workers. Even so, all industries have potential to improve their productivity and so provide further benefits.

Shifts in industrial structure are neither good nor bad

The preceding analyses show that overall productivity growth is explained mainly by the productivity growth within industries, with shifts in the industrial structure of the economy having a relatively small effect.

⁴⁷ The construction industry had very similar results to the wholesale and retail industries on these measures.

Shifts in industrial structure are, of themselves, neither good nor bad. They are the outcome of a complex interplay of changing factors, including labour participation rates, technology, prices, consumer preferences and incomes. Arguably of more concern are barriers that might slow down shifts in response to medium and long-term trends. Slow responses create economic costs by prolonging an inefficient allocation of resources in the economy. Efficient reallocation is discussed in Chapter 8.

5 Competition in the services sector

Key points

- Pressure from actual or prospective competition increases productivity growth.
- There is no single measure of the intensity of competition. This chapter presents data on four complementary indicators to provide an overall assessment of the intensity of competition across New Zealand's industries.
- The intensity of competition varies between industries within the services sector. But, generally, New Zealand's service industries experience less intense competition than the goods-producing industries and primary industries.
- When assessed at the whole-of-industry level, the service industries with less intense competition are finance and insurance, rental, hiring and real estate, retail, and professional, scientific and technical.
- Many policies and regulations, including barriers to foreign investors and to the use of foreign qualifications, affect competition in service industries. ICT is changing the landscape in ways that increase competition including by expanding consumers' access to information about service providers.
- The evidence that competition is relatively weak in some service industries suggests that measures to strengthen it would enhance innovation and productivity growth.

The Commission chose competition in the services sector as a topic for in-depth analysis because the intensity of competition significantly affects productivity growth. This chapter presents evidence about the comparative intensity of competition in New Zealand industries, including within the services sector. It introduces policy instruments that can influence competition, and which will be discussed in detail in later chapters.

5.1 Competitive pressure increases productivity growth

There is considerable evidence that pressure from actual or prospective competition increases productivity growth. Four reviews of the literature illustrate this.⁴⁸

- Ahn (2002) concluded from many empirical studies that the link between competition and productivity growth is positive and robust.
- The UK Office of Fair Trading (OFT, 2007) concluded that "there is a strong body of evidence that competition enhances productivity" (p. 15). It noted that competition enhances productivity through four mechanisms:
 - placing downward pressure on costs;
 - focusing firms on meeting customer needs;
 - leading to more efficient allocation of resources between firms; and
 - acting as a spur to innovation.

⁴⁸ The empirical and conceptual links between competition and productivity have been studied mostly at the level of firms or industries, rather than at the level of the macro economy. Nickell (1996) is an important empirical study. See also Ospina and Schiffbauer (2010) for recent evidence on the empirical links between competition and productivity, and Vickers (1995) for a conceptual discussion.

- Syverson (2011) found that “pressures from threatened or actual competitors can affect productivity levels within an industry” (p. 351).
- The OECD concluded:

[I]t is clear that firms facing more competition experience faster productivity growth ... this has been confirmed in a wide variety of empirical studies, on an industry-by-industry or even firm-by-firm basis ... The main reason seems to be that competition allows more efficient firms to enter and gain market share, at the expense of less efficient firms. Regulations or anti-competitive behaviour preventing entry and expansion may therefore be particularly damaging for economic growth. (2013c, p. 3)

In its submission, 2degrees argued that their entry into the mobile market led to \$3.9 billion in competition benefits (sub. 217), which is a local example of the benefits of more intense competition.

The OECD (2013c) reported that the relationship between the intensity of competition and innovation is not simple, and that moderately competitive markets innovate most, with both monopolistic and highly competitive markets showing weaker innovation. Firms in an intensely competitive market have an incentive to innovate to escape that competition. Yet, innovation may be discouraged if competition is so intense that firms expect additional revenues from innovation to be quickly eroded, particularly when large investment is required and the probability of success is small or unknown. The implication is that innovation is most likely to be fostered when the intensity of competition is “high but not too high” (OFT, 2007; Syverson, 2011; Aghion et al., 2005).

While this might seem to imply that government policies to influence competition in order to encourage innovation need to be finely balanced, this may not be the case. As the OECD points out, policies are not usually directed at making moderately competitive markets hyper-competitive, which may discourage innovation. Rather, policies are directed at strengthening competition in markets where it does not work well, which should promote innovation (OECD, 2013c). This perspective seems particularly appropriate in the New Zealand economy. The smallness and remoteness of many New Zealand markets limit the intensity of competition in them, making it unlikely that policies to promote competition will create competition so intense that innovation is discouraged.

The next section reviews the evidence about the intensity of competition in the services sector in New Zealand. This evidence – while highlighting the sector’s diversity – nevertheless suggests that the intensity of competition is relatively weak, so that measures to strengthen it would enhance innovation and productivity growth.

5.2 Measuring the intensity of competition in New Zealand industries

The intensity of competition varies between markets, and is best addressed empirically. Because competition is multi-faceted and difficult to measure (Høj et al., 2013; OECD, 2013c; Pilat, 1996), it is helpful to consider a variety of indicators rather than relying on one.

This section draws on research by the Ministry of Business, Innovation and Employment (MBIE), which used traditional and new indicators to investigate the intensity of competition in the New Zealand economy.⁴⁹ The Commission has updated MBIE’s indicators and developed new indicators, and used them to provide an overall picture of the intensity of competition across New Zealand service industries. The indicators are:

- domestic tradability;
- import penetration;
- rate of firm entry and exit; and
- price–cost margins (PCMs).

⁴⁹ The MBIE research was funded from the Contestable Departmental Research Pool. The main papers are Devine et al. (2011), Doan et al. (2012) and Devine, Nunns and Stevens (2013). The Commission is grateful to the MBIE researchers for making their source code available and for providing advice.

There are several caveats to the analysis that follows.

- The data used to measure the intensity of competition relates to industries rather than markets. Although the analysis is based on reasonably detailed industry groupings (generally at the 2–3 digit level of disaggregation within ANZSIC06), industries are invariably broader than the markets within which competition actually occurs. Partly this is because industries are defined nationally while markets are often local. For example, taxi services are defined statistically as a national sub-industry. But the markets for taxi services are specific to each city and town.
- Broad industry definitions imply further approximations. For example, the road passenger transport industry includes long-distance and urban bus services as well as taxi services. Long-distance bus services in particular are rarely substitutable for taxi services. One consequence is that 1-digit level industry averages can hide good and poor performance in individual sub-industries (Insurance Council of New Zealand, sub. 202; IAG, sub. 204).
- The indicators are estimated for each 2–3 digit level industry and then aggregated up to 1-digit level industries. Despite the consequent “broad brush” nature of these industry-level indicators of intensity of market competition, they provide useful information and can point to where more detailed analysis may be needed.
- It is challenging to gather accurate data on some indicators such as PCMs.
- The values of particular indicators can sometimes be interpreted in different ways. For example, a high PCM for an industry could indicate either a low intensity of competition or temporarily higher margins for successful innovators.
- The Commission did not take account of all indicators that try to measure the intensity of competition. For example, it did not make use of concentration ratios.
- In some cases the indicators give conflicting signals about the intensity of competition, which can only be resolved by more detailed analysis.

All this means that industry-level indicators are only broad brush measures of intensity of market competition. As the OECD concludes, “the analysis is not always straightforward, because there is not a single, right way of measuring competition” (2013c, p. 5). While it is therefore difficult to draw definitive conclusions about the intensity of competition from industry-level analysis, the Commission considers that the following analysis provides useful insights.

Domestic tradability of goods and services

The intensity of competition in a market is influenced by its openness to competition from other domestic or local suppliers. Where the costs of trading a service over distance are high, such as for services that require face-to-face delivery, markets tend to be localised and less open to competition that can boost productivity (Chapter 2).

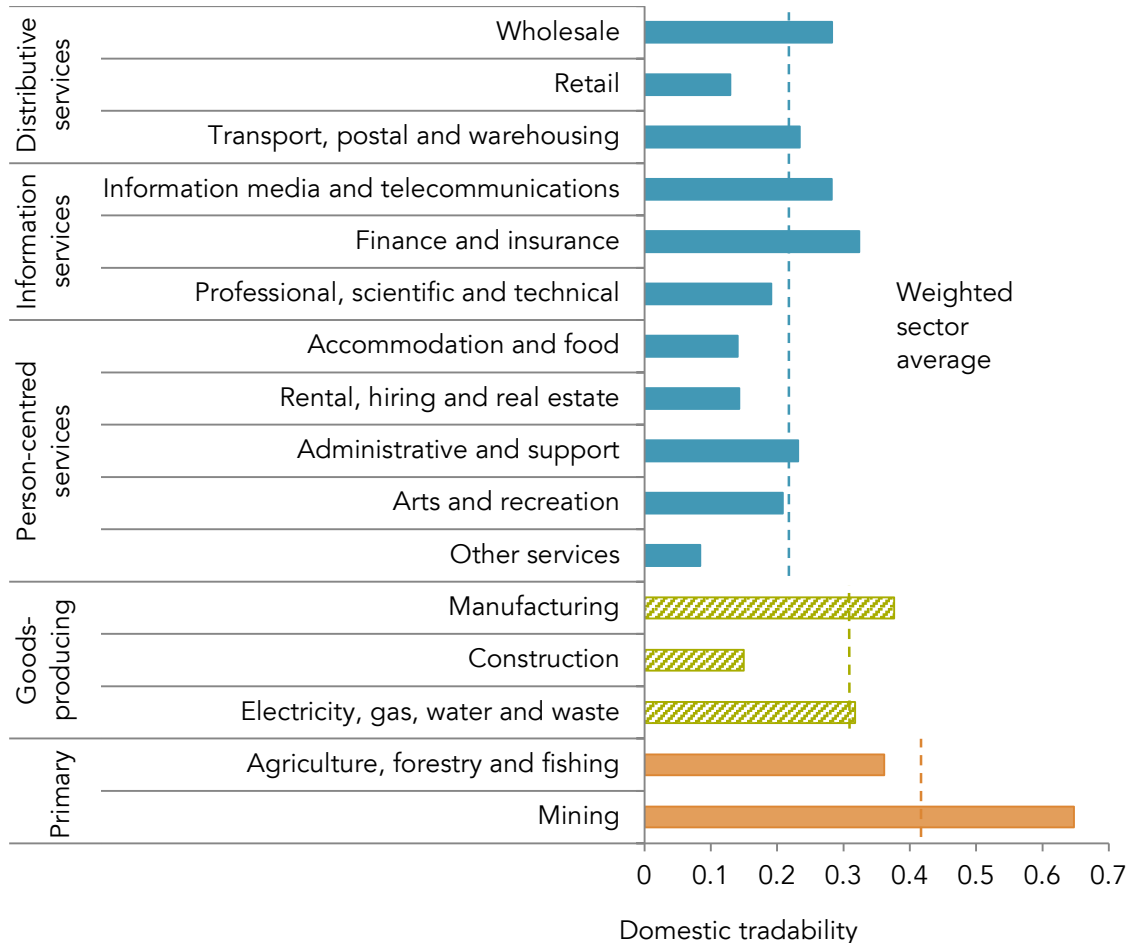
Figure 5.1 shows the domestic tradability of the goods and services produced by New Zealand industries. For each industry, where the products of that industry are consumed is compared with where they are produced. Overall, services are less tradable over distance within New Zealand than are goods. There are some differences between service industries. Finance and insurance, wholesale, and information, media and telecommunications services are more tradable over distance than other service industries, but still fall short of manufacturing, mining and agriculture. The industries with the lowest domestic tradability are accommodation and food, retail, and other services. Local markets in these industries may still be competitive if, for example, there are sufficient local suppliers.

F5.1

Services are generally less tradable over distance within New Zealand than are goods.

As discussed in Chapter 2, advances in ICT have significantly reduced the cost of providing many kinds of services over long distances. For example, retail services and education services (distance learning) are increasingly available over the internet. Increasingly, these markets are national, or indeed global, rather than local. This improves productivity by enabling producers to take advantage of economies of scale, but may reduce the number of competing producers in a local market, although not necessarily in the now larger integrated market.

Figure 5.1 Domestic tradability by industry, 2007



Source: Productivity Commission; Statistics New Zealand longitudinal business database.

Notes:

1. Geographic concentrations at 1-digit ANZSIC06 level are calculated as an average of production-weighted concentrations at the 3-digit level. Sector averages are weighted by number of employees. The analysis excluded proprietor-only firms.
2. 2007 data is used due to the availability of input-output tables.
3. The location of production is based on regional employment data. Measures of product consumption include final demand from households and intermediate demand from downstream firms.

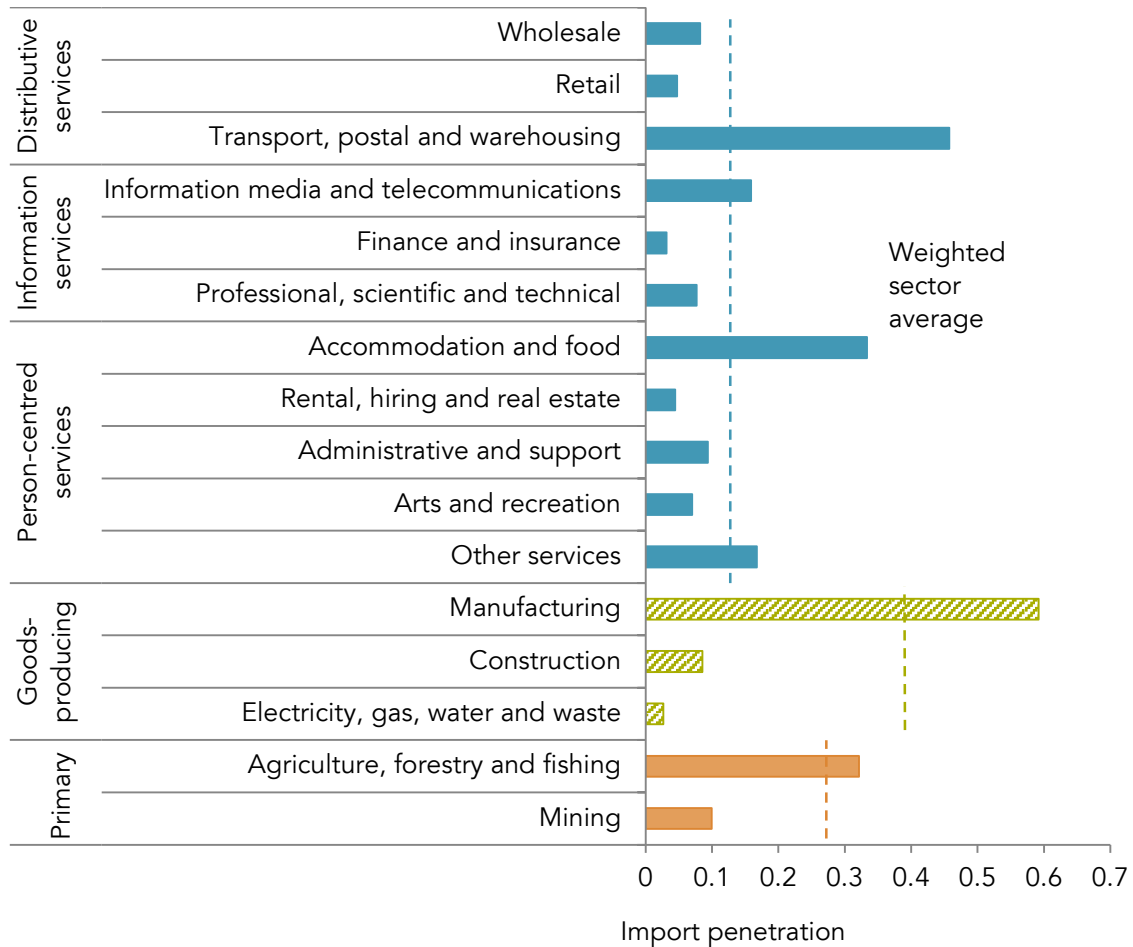
Import penetration

Geographic barriers affect international trade in services. One motivation for the EU and trans-Tasman “single market” projects has been to better integrate markets across the European Union and Australasia respectively, to achieve greater competition (European Union, 2012).

Figure 5.2 shows that the penetration of imports into New Zealand’s service industries is low compared with the penetration into manufacturing and agriculture, forestry and fishing. Imports of services make up about 25% of total imports. More than half of these imported services are expenditures on travel and transport by New Zealanders travelling overseas, rather than services supplied by foreign firms that compete directly with New Zealand firms (Meehan, 2014a). These expenditures help explain the high measured levels of import penetration in the transport, postal and warehousing, and accommodation and food industries.

Business services and retailing may become more exposed to import competition as online trading continues to develop.

Figure 5.2 Import penetration by industry, 2007



Source: Productivity Commission; Statistics New Zealand.

Notes:

1. Import penetration at the 1-digit ANZSIC06 level is calculated as an average of production-weighted values at the 3-digit level. Sector averages are weighted by number of employees.
2. Input-output tables were used to identify the intermediate and final consumption of imports. Export spending was excluded from the calculations of gross domestic production.

Assessing the extent to which firms in New Zealand face overseas competition is not easy. Recorded imports of services both overstate and understate the effects of foreign competition.⁵⁰ They overstate competition to the extent that imports include travel services provided in foreign markets, which are not close substitutes for some types of local travel services. They understate competition to the extent that they exclude services that foreign-owned establishments provide in New Zealand. For example, when someone purchases a book from an overseas supplier online, they are substituting overseas wholesale and retail services for local ones. This would not, however, be measured as an increase in the statistical measure of imports of services because import statistics do not include the foreign services embedded in imported goods (OECD, 2013a). If imports into New Zealand, like exports, have a high services content (Chapter 4), then foreign service providers do compete indirectly with local service providers via that channel.

Even so, Figure 5.2 implies that many service industries are sheltered from international competition. For services that require face-to-face interaction, travel costs create a barrier to cross-border trade. And as

⁵⁰ See Chapter 2 for the different modes of international trade in service.

discussed below, the small size of the New Zealand market makes foreign direct investment (FDI) less attractive in New Zealand compared with in larger markets. This further limits international competition.

Firm entry and exit

The rate at which new firms enter into, and existing firms exit from, industries is another indicator of the intensity of competition. Low rates of entry can signify barriers to entry. Barriers can have a variety of causes. Some, such as licensing or official-approval requirements, may be imposed by governments. Firms may also create barriers to entry through, for example, differentiating their product from those of rivals.

Low rates of exit can be a sign that competition is not sufficiently intense to force the least productive firms from the industry, or that there are barriers to exit. One example of a barrier to exit is where, if a firm is to cease providing a particular service, it must forfeit a licence that is valuable because the authorities limit the number of licences issued. Where this is the case, firms with low productivity may choose not to exit, and so deny firms with higher productivity the chance to enter the market.

Firm entry and exit is closely linked to resource reallocation, as explored in Chapter 8. An important driver of productivity growth is the movement of resources between firms. Exiting firms free up people, capital and land for better uses in new firms, and expanding existing firms.

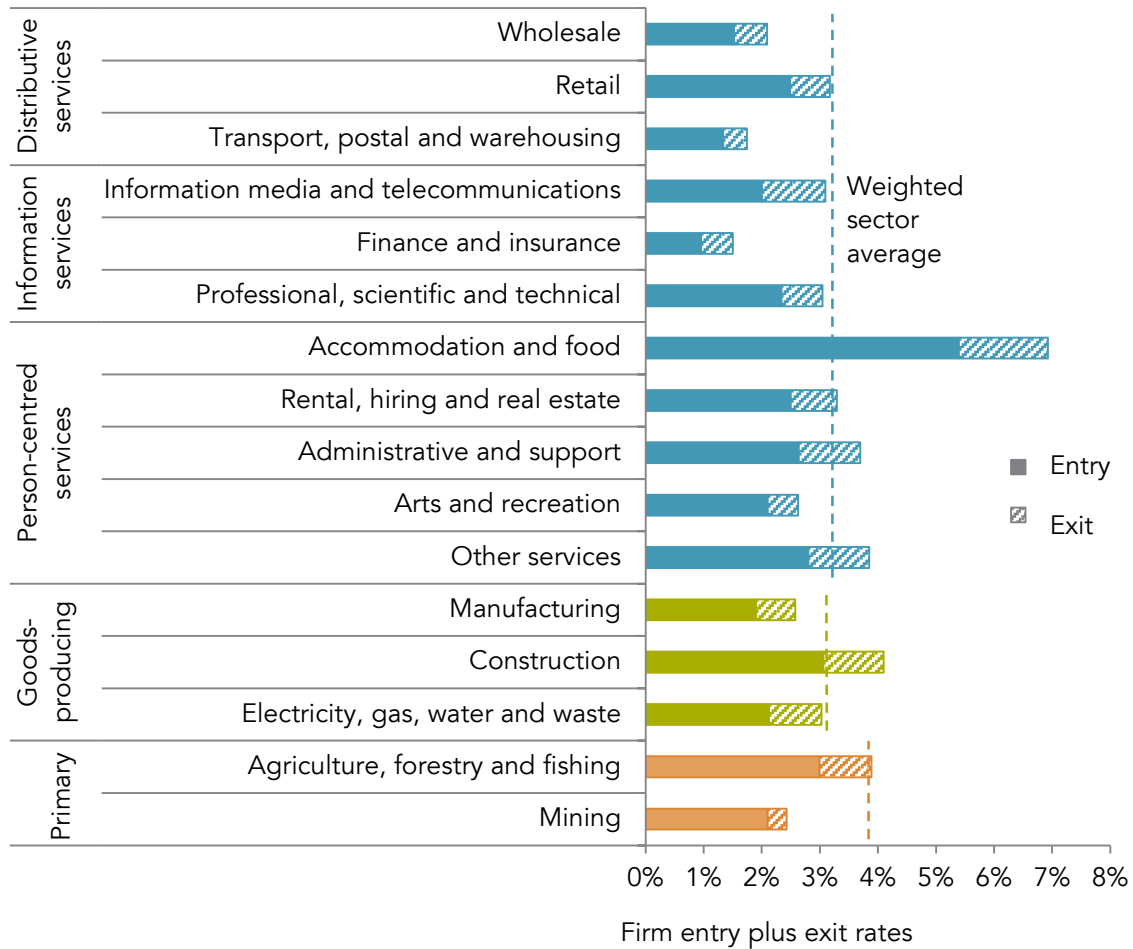
Low rates of entry and exit can weaken innovation. Some innovation comes from incumbent firms as they try to increase or at least maintain their market shares. Barriers to entry could, however, weaken an important source of innovation and rivalry from new entrants.

In some industries long-term contracts are common, for example in finance and insurance services. Firm exit in these cases can have wider costs and requires careful management. High levels of turnover would undermine market stability and damage the value of the services being sold. The insurance group IAG submitted that:

Prudential regulation also deliberately promotes continuity within the insurance sector, so that entry and exit of market participants is carefully managed. This calls into question the use of entry and exit statistics as a meaningful measure of competition in these markets. Where exit is required, this is usually carefully managed, and can take some time to ensure wider shocks are not felt in the market. Other service suppliers, particularly in financial markets, may well face similar features of market structure. These structural features impact directly on how competition occurs and how it is best measured. (IAG, sub. 204, p. 7)

Figure 5.3 provides data on the rates of firm entry and exit, by industry. Again, there are significant differences between industries. The services sector includes the industry with the highest rate of entry and exit (accommodation and food) and the three industries with the lowest rates (finance and insurance, transport, postal and warehousing, and wholesale trade).

Figure 5.3 Average annual rates of firm entry and exit, by industry, 2000–2010



Source: Productivity Commission; Statistics New Zealand longitudinal business database.

Notes:

1. Based on 1-digit ANZSIC06 industry categorisations. Data excludes proprietor-only firms.
2. Rates of entry and exit are adjusted for firm size (based on number of employees). So the above result is different to the findings of other New Zealand analysis where weighting is not used (such as Doan et al., 2012). Entering and exiting firms in the transport, postal and warehousing, and financial and insurance industries tended to be tiny relative to incumbents.

Price–cost margins

Firms that can price above cost and generate “above-normal” profits may have some degree of pricing, or monopoly, power. On this basis, estimates of a firm’s PCM are commonly used as an indicator of the intensity of competition in an industry. The larger the PCM, the weaker generally is the competition.

International evidence is that PCMs generally are higher, and more variable, in service industries than in manufacturing (Høj et al., 2007). Figure 5.4 shows that the average PCM in New Zealand’s services sector exceeds the goods-producing sector but is below the primary sector. The service industries where PCMs are relatively high are professional, scientific and technical services; rental, hiring and real estate; and finance and insurance.

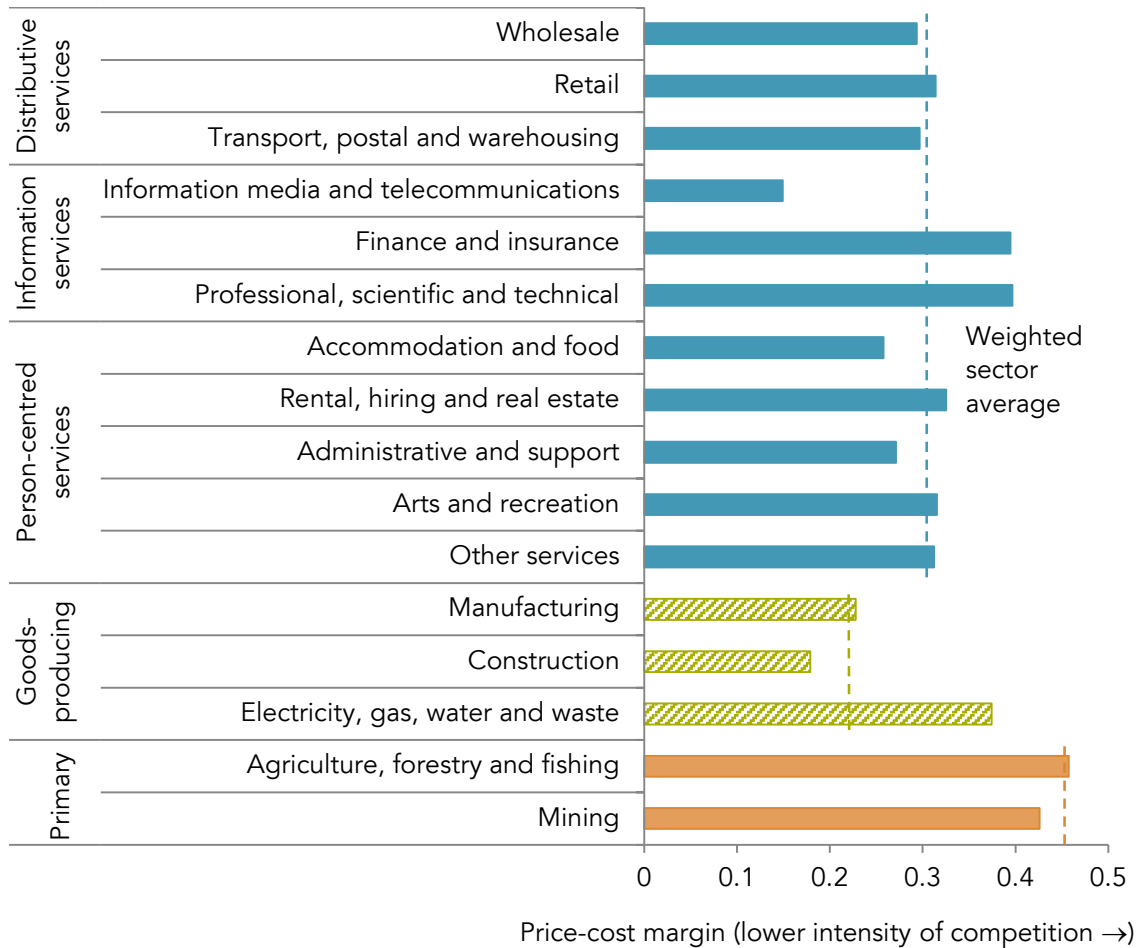
PCMs can be misleading.

- Estimates of cost often include labour and intermediate input costs, but not the cost of capital. This can distort comparisons between firms and industries with different capital intensities. This probably explains why in Figure 5.4 the primary-sector industries have high PCMs (signifying low intensity of competition), even though they generally operate in intensely competitive international markets. These industries are capital-intensive and/or land-intensive, and their high PCMs are likely to be the result of not taking account of the full cost of those inputs, rather than from low intensity of competition.

- In a dynamically competitive industry, more innovative and efficient firms achieve relatively high margins and gain market share, increasing the PCM measure for the industry. Yet, misleadingly, this might indicate that intensity of competition had reduced. For example, successful internet companies may have high margins but not necessarily for prolonged periods of time.

The elasticity of a firm’s profits to its variable costs – profit elasticity – is an alternative measure of the intensity of competition. Profit elasticity is unlikely to give a false signal in response to innovative firms gaining market share, but is not as well established or as commonly used as the PCM measure.⁵¹

Figure 5.4 Price–cost margin by industry, 2000–2010



Source: Productivity Commission; Statistics New Zealand longitudinal business database.

Notes:

1. Price–cost margin is the difference between price and cost as a proportion of cost.
2. Based on 2–3 digit NZSIC06 industry categorisations, aggregated to a 1-digit level based on production-weighted values, 2000–2010. Data excludes proprietor-only firms. Sector averages are weighted using number of employees.

The Commission’s 2013 business survey

The Commission’s survey of senior decision makers in 1 526 New Zealand businesses included questions about the experience of businesses buying services from other businesses. The questions asked about the types of services that firms buy, the intensity of competition in the markets for these services, and how firms make choices between, and switch between, service providers (Colmar Brunton, 2013; Box 1.3).

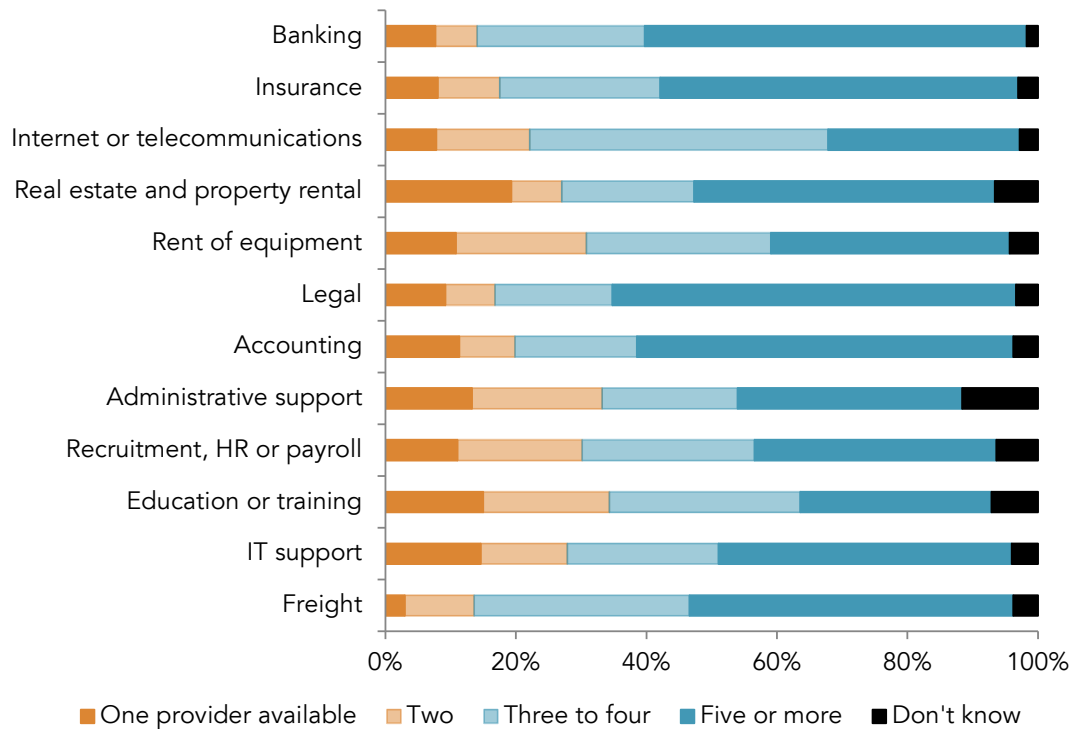
New Zealand firms generally consider they have reasonable opportunity to choose among alternative providers of most business services. Overall, less than 15% report they face a single supplier (Figure 5.5).

⁵¹ Devine et al. (2011), Devine, Nunns and Stevens (2013) and Doan et al. (2012) are research studies that use profit elasticity to indicate intensity of competition.

Purchasers report fewer choices of provider for administrative support; education and training; recruitment, human resources and payroll; and rental of equipment.⁵²

Firms based in cities consistently reported greater choice of service providers than firms in towns and rural areas.

Figure 5.5 Business perceptions of number of service providers, 2013



Source: Productivity Commission; Colmar Brunton.

Notes:

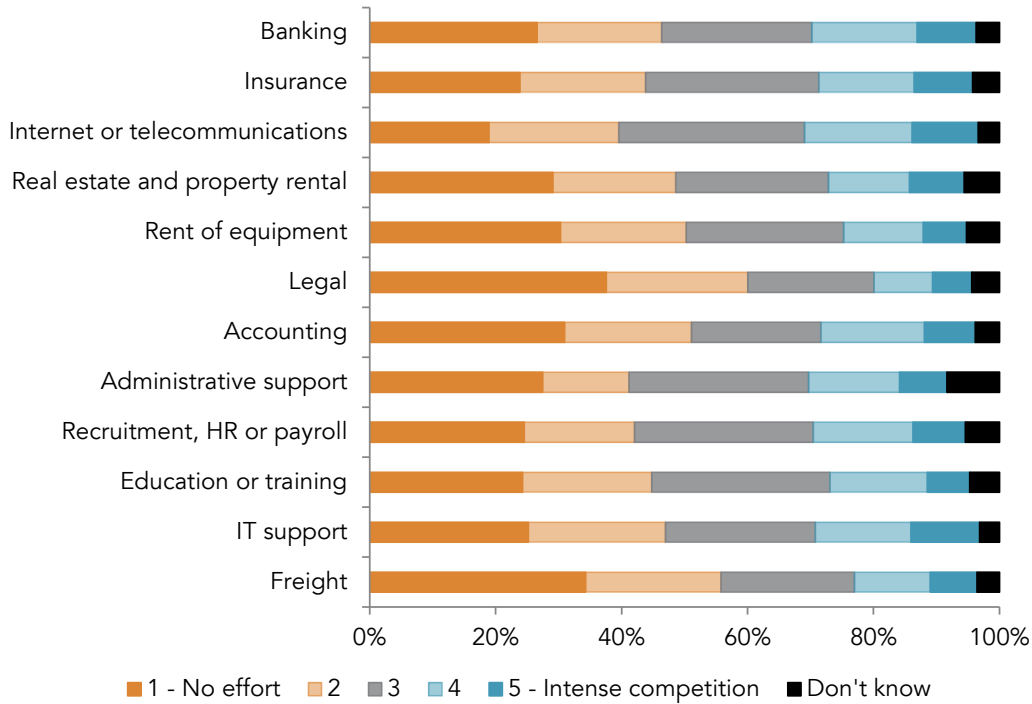
1. For each service the business had purchased in the last two years, survey participants were asked how many service providers they are aware of that could have provided the service (ie firms that were suitably located and capable of providing the service the business requires).
2. Each row in the chart is based on the subset of survey participants whose business or organisation had purchased the service in the last two years. The sample size for each row ranges from 264 (administrative support) to 1 253 firms (internet or telecommunications).

In another question, respondents rated the efforts of service providers to gain or retain the respondent's business (Figure 5.6). Across all categories of service provider, almost half of respondents considered their suppliers had made little or no effort. Providers of legal services were reported to put in the least effort (38% were rated as having made no effort), followed by freight, equipment rental, and accounting services. Providers of banking, telecommunications and IT support services featured as having made the strongest efforts (25% of respondents considered these suppliers had made a reasonably intense effort (ie, a rating of at least 4 out of 5).

Firms based in a town or rural area reported lower competitive effort in telecommunications, administrative support, education or training, IT support and freight provision. Firms based in cities reported lower competitive effort in banking. Small firms (less than 20 employees) generally reported less intense competition than larger firms, particularly in freight and education or training.

⁵² These services are those where fewer than two-thirds of respondents reported they had a choice between three or more service providers.

Figure 5.6 Business perceptions of service provider intensity of competitive effort, 2013



Source: Productivity Commission; Colmar Brunton.

Notes:

1. Survey participants were asked: "Of the service providers that did, or could have, provided these services, how intense was their effort to gain or retain your business (on a scale of 1 to 5)?"
2. Each row in the chart is based on the subset of survey participants whose business or organisation had purchased the service in the last two years. The sample size for each row ranges from 264 (administrative support) to 1 253 firms (internet or telecommunications).

Interestingly, there was little correlation across types of service providers between the number of service providers and the perceived intensity of providers' efforts to gain or retain business. For example, over 60% of respondent firms felt they had a choice of five or more legal service providers, yet over half of respondents rated legal service providers as making little or no effort. It is possible that the nature of certain services (eg, their complexity and barriers to switching) inhibits competitive behaviour more than the number of competitors in the market.

Overall picture of competition in the New Zealand services sector

The "heat map" in Figure 5.7 gives an overall picture of intensity of competition across the industries of the New Zealand economy. The Commission scored each industry on a scale of 1 to 10 on four indicators of competitive intensity. The most intensely competitive industry or industries on each indicator is shaded orange with a score of 10, and the least intensely competitive are unshaded with a score of 1. The Commission did not include the business survey results in the heat map because of the lack of a single indicator of competitive intensity based on the survey and because the "types of services" specified in the survey do not fully match the industry categories of Statistics New Zealand.

Figure 5.7 Relative intensity of competition in New Zealand industries (1 = least intense, 10 = most intense)

Services sector	Domestic tradability	Import penetration	Entry and exit	Price-cost margin
Wholesale	4	2	2	6
Retail	2	1	4	5
Transport, postal and warehousing	3	8	1	6
Information media and telecommunications	4	3	4	10
Finance and insurance	5	1	1	3
Professional, scientific and technical	3	2	4	3
Accommodation and food	2	6	10	7
Rental, hiring and real estate	2	1	4	5
Administrative and support	3	2	5	6
Arts and recreation	3	2	3	5
Other services	1	3	5	5
Goods-producing sector				
Manufacturing	6	10	3	8
Construction	2	2	5	9
Electricity, gas, water and waste	5	1	4	3
Primary sector				
Agriculture, forestry and fishing	5	6	5	1
Mining	10	2	3	2

Source: Productivity Commission.

Notes:

1. Scoring based on a linear scaling of each indicator relative to the minimum and maximum industry levels. It is possible that several industries may be assigned the same score.
2. PCM was inverted so that a higher score corresponds to more intense competition.
3. These indicators are aggregated to the whole-of-industry level. The intensity of competition in individual markets served by those industries can, and will, vary significantly from the industry-level averages.

These indicators of the intensity of competition vary considerably within and between sectors. But there is a general pattern that service industries experience less intense competition than industries in the goods-producing and primary sectors. Figure 5.7 suggests that the finance and insurance; rental, hiring and real estate; retail; and professional, scientific and technical industries have less intense competition than other service industries. No industry scores well on all indicators.

Given the clear evidence on the role that competition plays in improving productivity, it is logical that policy settings that intensify competition will also improve productivity. The rest of this chapter, and the two that follow, focus on improvements to policies that affect competition in service industries.

F5.2

The intensity of competition varies between industries within the services sector. But generally New Zealand's service industries experience less intense competition than goods-producing industries and primary industries.

F5.3

When assessed at the whole-of-industry level, the service industries with relatively weak intensity of competition are:

- financial and insurance;
- rental, hiring and real estate;
- retail; and
- professional, scientific and technical.

5.3 Policies that affect competition

Many policy instruments affect competition. The OECD has constructed a composite measure of the “competition-friendliness” of economic regulation in member economies. Conway and Nicoletti (2006) used this indicator to estimate that the OECD member countries with the least competition-friendly economic regulation forgo nearly 25% of the benefit from a productivity-improving shift in technology (compared with countries with economic regulation that restricts competition the least). They propose two factors that may be particularly important for this result:

- less investment in information and communications technology (ICT), particularly in the services sector; and
- curbs on multi-national firms establishing local affiliates, through which much technology diffusion takes place.

There are many other ways that policy can affect competition and productivity. For example, various rules affect international trade in services, occupational licensing affects markets in professional services, and consumer protection regimes influence the behaviour of firms. In addition, the Commission considers that competition law is important.

The New Zealand Council of Trade Unions cautions that increasing competition in service industries is not a panacea because some are natural monopolies and in other cases competition may stimulate growth that is dysfunctional for the rest of society.

Given that many services are (and will continue to be) natural monopolies or have very restricted competition for structural reasons, and many have significant positive and negative externalities (as we noted in our previous submission), it is not clear to us that a case has been made that increased competition is the answer in all service sectors, even if limited to the private sector.

To give a topical example, there is now evidence that the financial system can reach a size that harms productivity in the rest of the economy. (sub. 205, p. 3)

These are valid points. It is worth remembering that competition is one of many factors that influence market outcomes. But these points do not detract from the benefits of competition in most industries where, under the right conditions, it works well.

Information and communications technology

ICT is changing the landscape for how some services are delivered domestically and across borders (Chapters 2 and 8). These changes, in general, have increased competition in affected service industries.

ICT is also changing service market landscapes by expanding consumers’ access to information on service providers. Comparative websites help service consumers shop around for the best value by reducing the effort required to identify and compare products. Many sites also enable consumers to provide feedback on their experience, or initiate, online, a switch from one service provider to another. These features help address the information asymmetries, and the search and switching costs that inhibit competition in, and

the functioning of, some service markets. Chapter 6 considers further opportunities to use technology and better information to enhance competition in service markets.

More broadly, given the significant contribution that investment in ICT can make to productivity growth, the Commission explores ICT adoption policy issues in Chapters 8 to 11.

Barriers to international competition in services

International boundaries create additional spatial transaction costs and have significant impacts on services trade. Barriers to international trade in services generally occur “behind the border”, for example rules around visas, foreign investment and recognition of foreign standards and qualifications (Chapters 2 and 4). These barriers that affect competition in the New Zealand services sector are explored below.

Foreign investment screening requirements

Foreign firms need a domestic presence to be able to deliver services within New Zealand such as transport, postal and warehousing; and accommodation and food. They generally also require a presence to deliver services that rely on a national network, such as inter-bank payments and telecommunication services (Bourles et al., 2010).

Data is not available on the proportion of services purchased within New Zealand that are sourced from foreign-owned establishments (Meehan, 2014a).⁵³ Yet substantial foreign investment in New Zealand is evident in the finance and insurance, retail, and information, media and telecommunications industries. Internationally, the value of services supplied by FDI affiliates is probably greater than the value of services traded across borders (OECD, 2013a).

Restrictions or screening procedures that deter FDI in the New Zealand services sector may reduce competition. The Commission’s joint study with the Australian Productivity Commission (APC & NZPC, 2012) concluded that Australia and New Zealand impose relatively restrictive regimes on FDI inflows in general compared to many countries. Restrictiveness in New Zealand is driven to a large extent by screening processes for “sensitive” land, which the study concluded is unduly restrictive and creates unnecessary uncertainty for foreign investors. This is because the definition of sensitive land captures land that may not actually be “sensitive”, and screening criteria permit a high degree of discretion as to how relevant costs and benefits are weighted. This aspect of New Zealand’s foreign investment policy could be improved.

De Serres, Yashiro & Boulhol (2014) point out that NZ is one of the most open countries to service imports, and that relatively high restrictions on FDI relate mainly to the primary sector. But they conclude “Even so, considering the importance of FDI in stimulating competition in domestic services as well as a vehicle for technological and knowledge diffusion, measures to ease further restrictiveness could be helpful” (p. 30).

F5.4

Foreign suppliers increase the intensity of competition in New Zealand service markets. Cross-border regulatory differences and screening requirements for foreign direct investment can discourage foreign service providers from establishing a local presence.

The Commission made a number of recommendations for reducing these barriers on trans-Tasman trade in services in its 2012 joint study. The Government should implement those recommendations and build on them by reducing barriers to international trade in services with other countries.

R5.1

The Government should complete the implementation of the recommendations for reducing trans-Tasman barriers to trade in services made in the Commission’s 2012 joint study with the Australian Productivity Commission, and build on them by reducing barriers to international trade in services with other countries.

⁵³ The value of services provided by FDI establishments is not included in balance of payments data for imports. Rather, it counts as domestic output.

Behind-the-border barriers

Foreign firms that seek to export services to New Zealand or to set up a presence within the country face barriers “behind the border”, if they have to comply with regulatory standards that differ from those in their home country. Such differences can insulate domestic service markets from foreign competition. From a competition perspective, a desirable benchmark is regulations that are neutral between domestic and foreign suppliers. Submitters to the inquiry expressed a variety of views on the desirability of New Zealand taking more steps to open its service markets to greater competition from foreign suppliers (Box 5.1).

The Commission’s joint study identified barriers to trans-Tasman trade in services:

- restrictions remain on the trans-Tasman aviation market;
- exemptions from the Competition and Consumer Act 2010 (Australia) and Commerce Act 1986 (New Zealand) allow ocean carriers to form agreements on prices, capacities and schedules;
- differences in regulation prevent integration of telecommunications markets; and
- significant gaps remain in the implementation of the trans-Tasman Mutual Recognition Agreement.

Some of these barriers, and others, exist in relation to New Zealand’s trade in services with other countries.

Mutual recognition of international licensing criteria and standards is a relatively low-cost, decentralised means of dealing with inter-jurisdictional differences in laws and regulations by removing impediments to international trade in services, while allowing for an appropriate degree of regulatory independence to be retained.

In New Zealand many occupational licensing regimes appear to be the product of historical arrangements rather than careful policy analysis. Taking full account of the consumer protection concerns around quality assurance, there is little evidence that the barriers some regimes place in the way of well-qualified foreign suppliers are justified. This suggests that there is significant potential for productivity gains through:

- assisting New Zealand firms who are exporting professional or other licensed services into international markets, by ensuring that they can compete on a level playing field with both domestic operators and other international firms who can rely on mutual recognition arrangements between the target market and their home jurisdiction; and
- exposing domestic services and labour markets to competition and innovation from suppliers who use specialist staff from other jurisdictions.

An alternative approach to mutual recognition of standards is for New Zealand to adopt unilateral recognition of foreign standards where these are substantially equivalent to or better than local standards. This approach arguably offers a quicker and surer means of removing unnecessary barriers to competition from foreign service providers. Where foreign standards fail to meet New Zealand standards in a particular aspect, New Zealand could still substantially remove the barrier by confining its requirements to that aspect.

Box 5.1 Participants’ views on opening up service markets to greater foreign competition

Some participants called for a greater recognition of foreign qualifications; others wanted New Zealand regulations brought into line with overseas regulations to reduce barriers for foreign suppliers.

The entry of skilled aviation personnel into New Zealand is very much determined by the Civil Aviation Authority. In general they do not operate a permissive environment. For example it is virtually impossible for a pilot or mechanic from the United States to gain entry into New Zealand. With Canadians and Australians there is much greater flexibility however all personnel hold international licences. Their training establishments are regularly audited by the regulatory equivalent of the Civil Aviation Authority so one wonders why there is this very different standard. (Aviation Industry Association of NZ, sub. 13, p. 9)

There could be significant productivity benefits in looking to align particular regulatory developments in the Australian and New Zealand insurance industries, to help drive cross-border investment. (Insurance Council of New Zealand, sub. 11, p. 3)

Just as it is in New Zealand's interests to achieve access to overseas services markets, unilaterally opening up New Zealand's domestic services industries to international competition will be beneficial to New Zealand. This would not only benefit consumers of domestic services but would make our services sectors more competitive and productive. (New Zealand Chambers of Commerce, sub. 14, p. 4)

We could not support unilateral recognition of overseas occupational licences. Many occupational regulations embed local requirements (e.g. competency in earthquake engineering for structural architects, cultural sensitivity for carers). Each case has to be considered in context and requires broader consideration than purely commercial imperatives which appear to be the limit of the report. (New Zealand Council of Trade Unions, sub. 113, p. 3)

These submissions support an argument that New Zealand should recognise some additional foreign qualifications. In other cases, for example where the local context requires services of a particular quality or composition, there may be a case for the Government to stipulate those standards in order that services supplied meet the needs of New Zealand firms and households.

F5.5

New Zealand does not recognise some licences to practice held by foreign service providers even when those licences are based on equivalent or better standards than the corresponding New Zealand standards. Increased recognition of overseas qualifications would remove a barrier to competition.

R5.2

The Government should mandate the recognition of foreign licenses to practise when those licences are based on equivalent or better standards than the corresponding New Zealand standards.

Competition law

Competition law is another important influence on competition. Competition law covers areas such as:

- mergers and acquisitions that could result in firms gaining excessive market power;
- contracts, arrangements or understandings between firms that substantially lessen competition;
- natural monopolies; and
- anti-competitive behaviours by a single firm that has a dominant position in a market (or uses contract terms with customers that seek to lessen competition).

These areas of competition policy are framed mainly in the Commerce Act and administered by the Commerce Commission, as the competition regulator, and enforced by the Commission and the courts. Several issues relating to these policies are examined in Chapter 7.

Empowering consumers

Demand-side behaviour plays an important role in activating the competitive process. If business or households are reluctant to change to an alternative service provider it can have a dampening effect on competition, even if the market structure for that service appears relatively competitive. This issue is of particular interest in New Zealand because it is likely that the country's small size and isolation limits the intensity of competition compared with many other countries.

Where search and switching costs are high, there may be a role for Government in spurring both consumers and suppliers to operate more effectively, for example:

- government funding for comparison websites;
- information disclosure requirements; and
- prohibiting unfair contract terms.

Policy interventions to mitigate the effects of search and switching costs must be evaluated on a case-by-case basis. A range of approaches and initiatives to make it easier for consumers to find and change supplier are examined in Chapter 6.

5.4 Summing up: opportunities to stimulate competition

Competition in most circumstances is an important driver of productivity growth, and low intensity of competition exists in many service industries in New Zealand. These two points together suggest that policy measures to strengthen competition would enhance innovation and productivity growth.

Subsequent chapters deal with policies in relation to search and switching costs, competition law and business adoption of ICT. In these chapters the Commission investigates opportunities to improve competition and drive better productivity performance in the services sector. Consistent with the varied nature of services, the need and opportunities to improve performance vary depending on the context and nature of each service industry or sub-industry.

6 Addressing search and switching costs

Key points

- Confident and well-informed consumers play an important role in the competitive process. By seeking the best value, they advance their own interests and provide signals to suppliers on favoured product characteristics. Competition between suppliers who respond to these signals can lead to lower costs, improved quality, greater innovation and higher productivity.
- The costs of finding a supplier (search costs), and the costs of changing suppliers (switching costs) are particularly pronounced in some parts of the services sector. These costs can reduce competition in some circumstances by making it difficult for consumers to compare different service providers and respond to price and quality signals.
- Initiatives to help stimulate demand-based competition in service industries should extend to business consumers, as well as household consumers.
- Comparison websites can usefully support competition by reducing consumers' search costs. These websites are relatively under-developed in New Zealand.
- Inaccurate or misleading comparison websites can undermine efforts to increase transparency and competition in service markets. Other countries have developed best-practice guidelines and accreditation systems to help protect users of comparison websites. Introducing such measures is not currently necessary in New Zealand as the Fair Trading Act 1986 provides sufficient protection.
- Information disclosure is one approach that can increase transparency and competition in service markets. The recently introduced KiwiSaver periodic disclosure requirements are a good example.
- The banking industry recently introduced a system to streamline the process of switching banks. The publicity and transparency of this process should be increased. A similar industry-led initiative in telecommunications could address some remaining switching barriers, including email address portability.
- Regulating professional standards is of value to consumers. But professional standards can dampen competition if entry standards are set too high or if licensing requirements hinder competition from service providers who offer a cheaper but less "gold-plated" service.
- Recent policy reforms in the UK legal profession have made professional bodies responsible for promoting competition in the provision of legal services. There is merit in New Zealand following the UK lead by including the promotion of a competitive market in the statutory objectives for professional bodies.

The preceding chapter established some important findings about competition and its effect on productivity performance.

- Competition lifts the level and growth rate of productivity and economic growth.
- The intensity of competition in New Zealand is relatively low. Although competition varies significantly between different service industries, the services sector as a whole tends to experience less intense competition than the goods-producing sector.
- Service markets make up a large part of the economy and provide important inputs to other industries. So there are large potential benefits from policies that strengthen competition within the sector.

Competition policy is a significant lever at the Government's disposal to try to improve competitive outcomes in New Zealand markets. Much of the focus of competition policy in New Zealand and

internationally has been on supply-side issues such as removing unnecessary barriers to entry and provisions around monopolistic behaviour. However, demand-side behaviour also plays an important role in activating the competitive process (Waterson, 2003).

Confident and well-informed consumers who seek the “best” value (for the good or service they require) not only advance their own interests, but also provide signals to suppliers about the type of product they prefer. Competition between suppliers who respond to these signals can lower costs, improve product quality, increase innovation and boost productivity.

Consumers drive competition through the choices they make. If they are unable to make or act on informed choices, then competition will be distorted. Consumer policy may empower consumers to drive competition, and therefore have productivity enhancing potential. (OFT, 2007, p. 7)

This chapter examines how consumer actions can strengthen competition in the services sector, and how search and switching costs can reduce consumer influence. The chapter starts by examining the different search and switching costs that can affect service transactions. It then considers various approaches and initiatives that are employed to reduce search and switching costs, drawing on examples from other countries. The chapter ends by considering how professional bodies might help consumers make informed choices that will help to drive competitive outcomes in the services sector.

6.1 Search and switching costs can reduce competition

Two particular features of consumer behaviour impact directly on competition. The first aspect is how consumers search for service providers. The second is how consumers respond to the quality and prices that their current service providers offer (ie, whether or not they switch).

What are search and switching costs?

Search costs refer to the time and effort needed to find a suitable supplier of a service or good. Costs can increase if the range of choices makes it difficult for consumers to identify the option that best suits their needs. Several submitters noted the important role that readily available information plays in well-functioning markets:

Providing consumers with as much information as possible to drive competition is paramount for a well functioning market. (BNZ, sub. 110, p. 2)

For a market to operate efficiently, consumers require meaningful information about price and quality. (Miles Haywood-Ryan, sub. 117, p. 3)

Switching costs can be defined as “the real or perceived costs that are incurred when changing supplier but which are not incurred by remaining with the current supplier. ... Switching costs reduce consumer flexibility and lower the pressure exerted by the prospect of a consumer migrating to a competitor” (Xavier & Ypsilanti, 2008, p. 14).

Box 6.1 notes four of the more common types of costs that deter consumers switching between providers.

Box 6.1 Common types of switching costs

Financial transaction costs – This type of switching cost involves the loss of financially quantifiable resources. In a services context, these costs arise mainly from the structure of contracts (including marketing programmes) that the provider offers (Burnham, Frels & Mahajan, 2003). Typically, a consumer entering into a contract may see some up-front benefits (such as a discounted charge or provision of equipment), but there are penalties or fees for exiting the contract early. European survey data (BEREC, 2010) points towards contractual issues, particularly charges for ending a contract early, as the biggest single obstacle to switching providers in the electronic communications sector.

Procedural costs – These costs are incurred in the process of arranging a switch (eg, completing paperwork) and those associated with the timing of the switch. These costs are a barrier to switching if they make the process needlessly difficult or unnecessarily delay switching (OFT, 2003).

Compatibility costs – These costs arise where the consumer’s decision to purchase a service locks them into an ongoing requirement to use a complementary good or service or makes it hard for them to use an alternative supplier (Harris, 2012).

Relational costs – These costs stem from the emotional discomfort that arises as a result of switching (Burnham, Frels & Mahajan, 2003). For example, some consumers value the personal relationships that they build. This familiarity creates a level of comfort not immediately available with a new provider. Because many services are delivered on a face-to-face basis, it is likely that relational factors are particularly prominent in influencing consumer switching decisions in the services sector.

How do search and switching costs affect competition?

Search costs

If a consumer senses that search costs are high relative to the value of the purchase, they may not search for an alternative supplier, making their current supplier the “default” (Harris, 2012).

The OECD sets out the impact that search costs can have on the competitive process:

... in making well-informed choices between suppliers, consumers not only benefit from competition, but they exert the sustained pressure for providers to compete for their custom. Conversely, where consumers have too little information, poor quality information, or misinformation, they may end up misled and confused by the choices on offer, may pay too much or may buy the service which does not meet their needs. This may, in turn, inhibit and dampen the competitive process. (OECD, 2008a, p. 4)

Not every consumer needs to be well informed and an energetic searcher. But having more rather than fewer such consumers helps to keep firms on their toes because they know consumers will not use them if their price-quality offering is not competitive. In this way the informed searchers provide a spill-over benefit to other consumers and to the market as a whole.

Businesses seeking to increase market share will usually see advantages in providing information that reduces consumer search and switching costs. Businesses aim to show their service favourably and competitively, knowing that consumers are likely to compare them to similar providers. By contrast, in certain situations businesses have an incentive to increase search costs – a process that is sometimes called “confusopoly” (Box 6.2).

Box 6.2 Confusopoly

In markets with a relatively small number of competitors, businesses have an incentive to increase search costs to reduce price competition. One way to achieve this is by using complex or non-transparent pricing structures. Such structures make it hard to compare prices, reducing the likelihood that consumers will get the best deal and increasing scepticism and inertia about switching (OFT, 2013). This reduces the impact of the “marginal consumer” – the active shopper whose comparisons and switching behaviours might otherwise drive down prices for everyone.

In 2006 the then CEO of Telecom noted that confusion is an important marketing tool in the telecommunications industry:

What has every telco in the world done in the past? It’s used confusion as its chief marketing tool ... customers know that’s what the game has been. They know we’re not being straight up. (Theresa Gattung, quoted in Nowak, 2006)

Telecom argued that this comment had been taken out of context and that Telecom was aiming to give customers more control by developing a more transparent, open and easier-to-understand set of products. However others interpreted the comments as an admission that use of confusion was a part of Telecom’s business model (Nowak, 2006).

There is a fine line between complex price structures that arise due to legitimate service differentiation, and those designed to deliberately mislead consumers. The first can generate benefits for consumers by enabling firms to tailor their offerings to meet a variety of preferences and by allowing prices to react to underlying cost drivers. Such complex price structures can also facilitate competition and innovation, by enabling new entrants to offer new products or tariffs.

Switching costs

The potential for switching costs to negatively affect competition is well documented:

If suppliers know that a proportion of their customer base will not switch, then their response to cheaper offers from their competitors will be less immediate and not as significant. In contrast, suppliers with highly mobile customers need to respond to competitive threats to maintain market share and profitability. (Castalia, 2010)

While switching costs can significantly affect how competition works in a market, they do not necessarily make markets less competitive. Indeed, in certain circumstances, the presence of switching costs can have a positive impact on competition. In growing markets with many uncommitted new customers, switching costs can be an extra incentive for firms to compete intensely to lock in as many customers as possible. Further down the track these customers might not experience quite the same intensity of competition, but effectively the earlier aggressive competition has already compensated them for this.

Where switching costs result in consumers being “tied” to a supplier, they can create a powerful incentive for innovation:

Switching costs increase and secure the returns from successful innovation. If, however, the firm had no way of locking customers in (or of protecting its invention such as by a patent) then an innovative firm that has invested and researched a product or service innovation may soon find the market swamped by ‘me-too’ imitators ... The ‘lock-in’ caused by switching costs, however they arise, can consequently act like a patent in giving an incentive for risky investment. (OFT, 2003)

In addition, switching costs can also generate other benefits for consumers. For example, as discussed in Box 6.7, switching costs that tie consumers to a certain provider can create greater certainty for businesses about revenue and profit streams. This can enable businesses to provide services they might otherwise not have been willing to provide, or to provide their services at a lower cost.

Although switching costs can strengthen the incentives to compete for new customers, they can be problematic for competition in mature markets with few new customers. In this situation, established firms may seek to increase switching costs so they can raise the prices they charge existing customers, rather than competing vigorously for a small number of uncommitted customers.

Switching costs are also particularly problematic in markets where the up-front competition for customers is weak.

Switching costs frequently arise in durable goods markets or in technically sophisticated products that are rarely characterised by perfect competition. Such markets are often characterised by a minimum efficient scale and sunk costs in production, so that there are barriers to entry. In addition, the products are often differentiated reducing the intensity of *ex-ante* competition. More generally, the foremarket [the market at an earlier date] may be highly concentrated, or one firm may have a first-mover advantage so that fierce *ex-ante* competition did not compensate for *ex-post* lock-in. (OFT, 2003, p. 120)

A barrier to switching between providers in a market can also be a barrier to a business entering the affected market. This occurs when new entrants are deterred from entering the market due to a belief that switching costs will prevent them from winning customers from their existing provider – further dampening the effectiveness of competition (OECD, 2008a).

Switching costs should be evaluated on a case-by-case basis. They do not always cause competition problems, but they do tend to make competition more “fragile” (Farrell & Klemperer, 2007). This indicates

that there can be a case for policy interventions to mitigate the effects of switching costs, but only in certain instances. Box 6.3 sets out how the case for government intervention might best be assessed.

Box 6.3 Assessing the case for government intervention to address search and switching costs

Problem definition

Before any decision to intervene, it is important to establish the nature and magnitude of the problem. As discussed in the previous section, switching costs do not always reduce competition. Often the dampening effect of switching costs on competition is compensated for by fierce up-front competition.

The case for government intervention to address search and switching costs is likely to be strongest in the following situations:

- in mature markets where there are few new customers;
- in markets for sophisticated products where information asymmetries reduce the ability of consumers to assess the offers of alternative suppliers; or
- in concentrated markets with less intense competition.

In addition, government intervention to provide information that reduces consumer search costs may be desirable on the grounds that information is a “non-rival” good – meaning that its use by one consumer does not reduce its use to other consumers. A private firm could be unwilling to invest in collecting information because, once collected, it is difficult to stop the information leaking widely, meaning the firm is unable to charge for the information. Even if the firm can charge, this could be inefficient because the price is higher than the marginal cost of distributing the information (which can be very close to zero). Of course, as noted in this chapter, some private firms do provide free access to comparison websites and make this succeed through advertising. But this does not always happen, or the information may be biased or incomplete in some way.

Option development

Where search and switching costs are seen as limiting or distorting competition and harming consumers, the options to address this problem need to be laid out. Typically the options will range from doing nothing, to facilitating a private-market solution, to government action by way of regulation or direct provision. Three types of intervention are provision of information, reducing transaction costs and addressing compatibility costs.

Provision of information – this option can reduce switching costs caused because consumers find it hard to get information about alternative suppliers or to identify the product that best meets their needs. Governments can intervene by requiring businesses to disclose certain types of information to consumers. A more aggressive strategy is to compile the information and present it in a comparative format (such as a comparison website that the Government provides or subsidises).

Reducing transaction costs involved with switching – while it is impossible to eliminate transaction costs altogether, there can be a role for government intervention to reduce such costs. Developing guidelines that set out an appropriate process to conduct the switching process is one such intervention.

Addressing compatibility costs – where a purchase from a provider locks a consumer into future purchases from the same provider, there may be a case for requiring firms to change their products to enable consumers to switch more easily. One example is phone number portability.

Option assessment

The final step is to estimate the costs and benefits of each option to assess which one offers the highest net benefit to society as a whole.

The main benefit from any intervention should be that barriers to consumer search and switching are reduced, resulting in greater intensity of competition, improved consumer welfare (due to lower prices, better quality or improved choice) and greater incentives for businesses to innovate and respond to consumer preferences. In addition to benefits from competition, interventions might increase consumer confidence in the market, stimulating economic activity that would not otherwise have occurred.

The costs of each option must be identified and counted. Interventions will require the use of resources by both government and affected businesses. An important challenge is to identify and cost any unintended consequences of each option. There is also the risk that interventions can reduce investment in a market and dampen innovation. Government interventions might also crowd out the opportunity for effective private solutions to switching costs. Government interventions could be better or worse than private solutions and would need to be compared for cost, quality and meeting consumer needs.

Source: Productivity Commission; OFT, 2003.

R6.1

Before the Government undertakes any initiative to reduce search and switching costs, it should establish that those costs do have adverse effects, and assess a range of intervention options using a thorough cost-benefit analysis.

Search and switching costs in service markets

Search and switching costs affect transactions in goods markets as well as services. Yet the nature of some service transactions makes them particularly susceptible to search and switching costs. For many services, such as legal or financial advice, the consumer knows considerably less about what they are purchasing than the service provider. These information asymmetries mean that consumers may face costs in learning about the service before making an informed decision about which provider will best meets their needs. The results of a large-scale survey of consumer behaviour in Europe show that 51% of consumers find it easy to compare services, while 63.5% find it easy to compare goods (European Commission, 2012).

Hazards & Compass (sub. 116) note that information asymmetries are particularly acute when the service provider has a high degree of domain knowledge and conducts many similar transactions, and the other party (the consumer) may only conduct one or two similar transactions in their lifetime. "Examples include selecting a mortgage type and provider, making an investment or choosing a KiwiSaver plan, and choosing among bids to complete a job." (Hazards & Compass, sub. 116, p. 1)

Service transactions are often highly complex, which might have the effect of locking in consumers to certain service providers. In addition, many services such as telecommunications and banking are provided on an ongoing basis with some form of contract. Such contractual arrangements can lock in the consumer, despite also providing them with benefits.

Switching behaviour of businesses

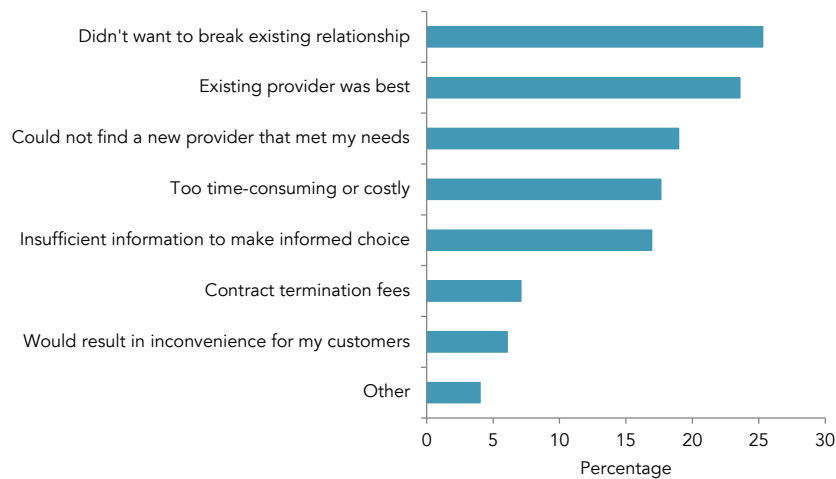
The services sector is tightly interlinked with the rest of the economy (Chapter 4). More services are purchased by firms, as inputs into their production, than by household consumers. This means that business consumers are at least as important as household consumers in driving the competitive process.

Most literature on search and switching costs tends to focus on household consumers. Yet search and switching costs can be a real barrier for firms short on time and resources. Castalia (2010) notes that search costs can be particularly high for small businesses. Castalia uses electricity as an example, noting that electricity costs represent a small proportion of the total costs of small and medium enterprises (SMEs), and that the time of such business owners has a high opportunity cost (SME owners are often described as

“time poor”). Research on the UK financial services industry notes that SMEs rarely switch their banking services, with 51% of SMEs having never switched their main bank (Accenture, 2011).

In the Commission’s business survey, participants were asked about instances where they had considered switching service providers but ultimately stayed with their existing provider. As shown in Figure 6.1, relational factors were the most common reason for staying with an existing provider. In many cases, businesses that considered switching concluded that their existing provider was the best available. Difficulty finding a suitable alternative, a lack of information and the switching process being time-consuming or costly were also common issues.

Figure 6.1 Business reasons for not switching service providers, 2013



Source: Productivity Commission; Colmar Brunton.

Notes:

1. Businesses were asked to identify services where they had considered switching but decided not to. Businesses were then asked what factors caused them not to switch.
2. Participants were able to cite multiple reasons for not switching. The chart is based on 2 516 responses, summing the information from all types of services.

6.2 Reducing search and switching costs

Comparison websites

The internet has significantly altered how consumers search for information about the availability, quality and price of goods and services. Websites that offer comparisons between different service providers have multiplied in Europe and the United Kingdom and, to a lesser extent, in Australia.

Comparison websites help to reduce search costs by providing consumers with information that lets them compare competing service providers. Some of these websites also provide mechanisms to help the consumer switch. Trade Me notes that comparison websites are a useful tool for consumers provided they are accurate and up-to-date:

Comparison sites work for consumers by increasing visibility of options, widening choice, and provide more knowledge about a particular service or product industry. It’s vital for both the credibility of the comparison site and the service providers who are being compared that the information on the site is up-to-date and accurate. (sub. 214, p. 2)

Comparison websites certainly have the potential to reduce search costs in service markets, but it is difficult to assess the extent to which this is increasing competition. What is clearer is that comparison websites are popular with consumers. For example:

- a review of comparison websites in the United Kingdom found that 81% of consumers had used a price comparison website in the past 12 months, while 67% of consumers who bought or renewed car insurance in the last 12 months used a price comparison website (Consumer Focus, 2013);
- Canstar’s Australian website noted 2 million hits to its site each year (Canstar, 2013a); and

- in New Zealand, PriceMe's marketing director stated in July 2013 that the website was getting 700 000 hits each month and expected this to rise to 1 million hits by December 2013 (Jancic, 2013).

F6.1

Accurate and accessible comparison websites can help to reduce search costs and facilitate more competitive markets.

Three main ownership models for comparison websites are:

- government operated or funded comparison websites;
- consumer organisation-funded comparison websites, funded by members or other independent contributions; and
- private-sector comparison websites that operate under a business model.

Government operated or funded comparison websites

Governments provide comparison websites in some countries to reduce search costs. A review of practices in Australia, the United Kingdom and Europe indicates that telecommunications and insurance are the service markets where governments are most pro-active. Governments have also developed comparison websites for the retail electricity market.

The Australian Government through the Private Health Insurance Ombudsman (an independent government agency) runs a website where users can compare health insurance services. The site's objective is to address the challenges for consumers in comparing complex products (PHIAC, 2013). The site complements regulations that streamline the switching process for consumers. For example, the Private Health Insurance Act 2007 regulates switching between schemes so that hospital cover transfers easily. Government support for the comparison website occurs within the context of the Government being keen to encourage the uptake of private health insurance to reduce pressure on the public health system.

Ireland's Health Insurance Authority also operates a website that compares private health insurance providers. The site is part of a broader initiative to increase the levels of competition and the number of providers in the market.

Ireland also has a comparison website for mobile, home phone and broadband price plans. The site's objective is to increase competition by helping consumers compare plans. Portugal's National Communications Authority operates a similar service for telecommunications services that lets private consumers compare various tariff alternatives for mobile telephone services.

The approach in New Zealand

Currently New Zealand has two examples of government involvement to reduce search and switching costs through the use of comparison websites. The most well-known example is "Powerswitch", an interactive price comparison website covering electricity and gas suppliers for household consumers.

Powerswitch is owned and operated by Consumer NZ (an independent, non-profit consumer advocacy organisation), with government funding provided through the Electricity Authority and the Ministry of Business, Innovation and Employment (MBIE). The Electricity Authority launched the "What's My Number" campaign that promotes consumers to connect to Powerswitch in 2011. The Authority also provides a service for business consumers to gather quotes from different suppliers.

The Electricity Authority (2013) reported that during the campaign's first full calendar year there were 24 209 additional residential switches compared to before the campaign. These additional switches are estimated to have resulted in annual consumer savings of \$4.24 million (Electricity Authority, 2013).

The extent to which increased consumer switching has affected retail electricity pricing and the behaviour of electricity providers is less clear. A recent evaluation (Covec, 2013) found no evidence that the campaign had affected retail electricity prices. However the evaluation also found some evidence that the number of retail brands had increased and that there had been improvements in non-price dimensions of competition

among electricity retailers, such as a greater propensity for retailers to approach customers directly with offers (Covec, 2013). The Electricity Authority's Chief Executive has argued that this evaluation did not capture the full range of benefits from the campaign:

... we believe the benefits to the consumer are far wider than that because we've seen more competitive pressure on retailers. They've altered their pricing decisions and that has driven a lot of value for a lot of consumers... (Carl Hansen, quoted in Hickey, 2014)

TelMe is a second example where government funding has helped to provide comparative information. TelMe is operated by Consumer NZ, with assistance from a Commerce Commission grant. TelMe lets users compare combinations of internet, mobile, landline and television. The Productivity Commission understands that telecommunications providers have strongly criticised TelMe, mostly out of concern that the information provided on TelMe is inaccurate or outdated. The website is not widely publicised.

If a cost-benefit assessment (Box 6.3) determines that the Government should fund or administer a comparison website, then the website should be appropriately resourced so that the information presented is accessible and accurate. Also, any such initiative should be subject to any disciplines applying to privately provided comparison websites (oversight of privately operated websites is discussed later in this chapter).

F6.2

Government initiatives to fund or develop comparison websites need to be appropriately resourced so that the information presented is accessible and accurate.

Consumer organisation-funded comparison websites

As noted above, Consumer NZ provides comparative information to consumers about different service markets. Besides being involved with the Powerswitch and TelMe initiatives, they regularly review insurance markets and sometimes conduct mystery shopper exercises in various markets (discussed in Chapter 7). Consumer NZ also performs advisory services by responding to consumer complaints (mostly related to the Consumer Guarantees Act 1993) and using their website to provide consumer rights information.

Consumer NZ was established as a government department in 1959 before becoming independent in 1980. Consumer NZ was originally heavily subsidised, but since becoming independent its funding has mainly come from membership subscriptions, and much of the information it collects is limited to members. This business model is broadly consistent with that used by consumer advocacy groups in the United Kingdom, Australia and the United States.

Although membership rates in New Zealand compare favourably with consumer organisations in other countries, New Zealand's relatively small population makes it difficult for Consumer NZ to cover the fixed costs associated with testing products and compiling information. Consumer NZ's subscription revenue in 2012 was about \$5 million (Consumer NZ, 2012), while the Consumers Union in the United States collected US\$234 million in subscription revenue in the 2012/13 financial year (Consumer Union, 2013).

Consumer NZ has indicated a desire to develop further partnerships with government agencies in a similar vein to their work with the Ministry of Consumer Affairs and the Electricity Authority. However, it has noted that the government agencies charged with promoting competition are generally unwilling or unable to provide financial support to others to help achieve this aim.

Privately operated comparison websites

Privately operated comparison websites are becoming increasingly common internationally. These sites cover a range of services and take a variety of forms, with some just comparing on the basis of price and others incorporating quality dimensions or providing for consumer feedback and rating of service providers.

Privately operated comparison websites tend to be less common in New Zealand than in some other OECD countries. It is likely that the small scale of the New Zealand market makes it difficult for comparison websites to attract enough traffic to be commercially successful because these websites generally rely on revenue from advertising or commissions from providers that are part of the website. In saying this, there are no apparent barriers to entry for comparison website providers and some have emerged in recent years. Examples include:

- Life Direct – a health, life and income insurance policy comparison site that provides price comparisons and a star system to compare quality of products and customer service;
- PriceMe – a website that provides price comparisons for a wide range of consumer products; and
- Canstar – a website that provides a star rating for various banking products, KiwiSaver, travel, pet and life insurance, travel bookings, mobile phone providers, petrol and diesel service stations, electricity retailers and some products.

F6.3

Privately operated comparison websites tend to be less prevalent in New Zealand than in other countries. There are no apparent barriers to entry in this market, and new firms have entered in recent years. It is likely that the small scale of the New Zealand market makes it difficult for comparison websites to attract enough traffic to be commercially successful.

For comparison websites to have a positive impact on the competitive process, it is important that the information on them is complete, accurate and transparent. The European Commission notes:

Comparison tools have a clear potential for empowering consumers... Nevertheless, the rapid proliferation of comparison toolsites and the influence they can have on consumers' decisions have also given rise to concerns about their trustworthiness. If the transparency and reliability of comparison toolsites is not guaranteed, they can become a source of consumer detriment and risk undermining consumers' trust in the market as a whole. (2013a, p. 6)

As noted earlier, the Commission understands that some concerns have been raised about the accuracy of the comparisons on the TelMe website. Websites that allow users to post reviews of services such as accommodation and restaurants have also attracted some criticism (Gillies, 2013).

Issues relating to the accuracy of comparison websites have also emerged in Australia (Box 6.4).

Box 6.4 Potential for comparison websites to mislead consumers

iSelect is an Australian website that provides comparisons of various insurance policies, household utilities and personal finance products. It is best known as a health insurance comparison website and sold 100 000 health insurance products in 2012.

In 2007 the Australian Competition and Consumer Commission (ACCC) raised concerns that iSelect was misleading consumers about the range of insurance policies that were compared before a policy was recommended. In response, iSelect ceased making the alleged misrepresentations and also agreed to inform certain customers (for whom it had arranged to purchase health insurance policies) of the range of insurance policies that it compared for them.

At the time, the ACCC Chairman noted:

...recommendations by brokers or intermediaries can be of benefit to the public in their purchasing decisions. However, it is fundamental that such companies do not mislead consumers regarding the scope of the comparisons which they make when recommending a service provider.

Source: ACCC, 2007.

F6.4

Comparison websites can undermine consumer confidence if the sites fail to provide reliable information or are not transparent about the number of service providers they are comparing, how the sites receive revenue, how the sites rank providers and how the sites receive information.

Some inquiry participants suggested that comparison websites are suited only to certain markets:

... while the Insurance Council acknowledges the benefit of switching tools for some New Zealand consumers in the electricity sector, these tools would not provide the same benefit for consumers of differentiated products such as fire and health insurance policies.

There would be a major risk that if a price comparison tool was established for insurance that consumers would focus solely on price as opposed to the detail of what the cover and risk is. (Insurance Council of New Zealand, sub. 202, p. 2)

In other countries comparison websites have strengthened competition in insurance markets. For example, the Competition Commission (2013a) report that comparison websites for private motor vehicle insurance in the United Kingdom have enhanced rivalry in the market and that competition between insurers on comparison websites is intense.

Many comparison websites in New Zealand and overseas provide comparisons of quality variables as well as price. For example, Canstar has produced a star rating for travel insurance policies that includes consideration of 13 different product features:

There is far more to travel insurance than simply price... To determine true value, we looked for the right balance between price and thirteen different product feature categories across 4 (Australia only), 10 and 30 days travel duration. (Canstar, 2013b, p. 3)

While it is important that comparison sites are accurate and do not mislead consumers, the Productivity Commission does not think that these sites should be restricted to certain markets. Indeed, comparison websites are likely to be particularly valuable to consumers of more complex services where customers know less about the service they are purchasing than the seller.

Consumer NZ suggests that development of comparison websites in the general insurance market would benefit consumers:

Another area where consumers might benefit ... is in the provision of an independent site for general insurance comparisons and switching. Unlike other countries where the large populations make it commercially viable to set up these sites, NZ has been slow off the mark. This has been to the detriment of NZ consumers who remain confused about the offerings and find it difficult to make comparisons. (sub. 221, p. 4)

Standards for comparison websites

There are no specific guidelines or rules relating to comparison websites, but they are covered by general provisions in the Fair Trading Act 1986. Part 1 of that Act prohibits misleading and deceptive conduct and false representations. With regards to service, the Act states that "[n]o person [or business] shall, in trade, engage in conduct that is liable to mislead the public as to the nature, characteristics, suitability for a purpose, or quantity of services".

The Fair Trading Act also contains a general prohibition on "unsubstantiated representations". This provision was introduced recently in the Fair Trading Amendment Act 2013 and provides that traders cannot make representations (eg, in advertising material) without having reasonable grounds for making those representations. Previously the Commerce Commission needed to prove that a representation was false, but businesses are now required to show evidence to prove that statements are accurate.

The Financial Markets Conduct Act 2013 (which came into force in April 2014) applies to comparison websites that cover insurance and other financial products and services. Sections 19 to 33 of the Act prohibit misleading or deceptive conduct, the making of false or misleading representations, and the making of unsubstantiated representations. The Financial Markets Authority is responsible for monitoring compliance with this Act.

The Commerce Commission is responsible for monitoring compliance with the Fair Trading Act and providing guidance on the law and how it will be enforced. The Productivity Commission understands that if comparison websites emerged as a source of particular concern for consumers, the Commerce Commission would likely publish guidance on how the Fair Trading Act applies to comparison websites.

Is there a need for additional oversight?

In response to the increasing prevalence and use of comparison websites, some other countries have adopted or recommended safeguards over and above general consumer laws (Box 6.5).

Box 6.5 Oversight of comparison websites – approaches in other jurisdictions

United Kingdom

Research by Consumer Focus in the United Kingdom (2012) identified seven different accreditation systems for price comparison websites. Five of these are industry-specific and two are multi-sector.

Government agencies run three of the accreditation systems.⁵⁴ For example, Ofcom (the UK regulator and competition authority for the communications industry) launched an accreditation scheme for price comparison calculators in 2006. Ofcom determined that an accreditation scheme is the most effective way to ensure wide availability of independent price comparison information. The accreditation process involves an initial audit and then periodic audits about once every 18 months. Website operators are charged a fee for each audit.

Non-government organisations run the remaining four accreditation systems. For example, the British Insurance Brokers Association offers accreditation for insurance comparison websites. Standards that must be met to obtain accreditation include the use of facts and not assumptions as the basis for quotations, explanations of what the policy does and does not cover and the differences between each insurance policy being made clearly visible (BIBA, 2008).

Research comparing the performance of accredited and non-accredited comparison websites found that accredited sites performed only marginally better. Websites were assessed on 35 variables. For 28 of these, the performance of accredited websites was not significantly different to that of non-accredited websites. On six variables the accredited websites performed better, while non-accredited performed better on one (Consumer Focus, 2012).

Europe

The European Commission held a Summit in March 2013 to discuss the transparency and reliability of comparison websites. A key driver of this work was promoting consumer trust in digital and e-commerce. The Summit recommended that work be undertaken to establish guidelines on the transparency, impartiality and reliability of comparison websites (European Commission, 2013a).

Australia

Choice (an independent consumer organisation) has initiated a super complaint with the New South Wales Office of Fair Trading about inconsistent advice on commercial energy comparison websites. Choice recommended that an accreditation system for commercial switching sites be introduced – similar to that operating in the United Kingdom – to help consumers identify the switching sites they can trust (Choice, 2012).

Currently in New Zealand no accreditation options exist for comparison websites. However inquiry participants did not see this as a problem:

If a person is offering a comparison website in order to advance a commercial interest, the person or company will presumably be 'in trade' and therefore, need to meet obligations under both the Fair Trading Act and Consumer Guarantees Act. As such, a person will have recourse under consumer legislation if they have been misled by the comparison website... Therefore, existing regulatory requirements already provide protection to consumers, without the need for an additional accreditation system. (Trade Me, sub. 214, pp. 2-3)

⁵⁴ When Consumer Focus did the research, government agencies ran two accreditation systems. Recently, the Office of Gas and Electricity Markets took over the accreditation system for energy comparison websites.

... it is not evident why the proposal to accredit comparison websites is necessary. There does not appear to be any particular problem with comparison websites in the financial services sector in New Zealand. Indeed, they are [a] very useful tool for consumers. (Westpac, sub. 219, p. 3)

While the case for a government-sponsored accreditation system for comparison websites is weak, non-government organisations could fill this gap. This might involve a private business or non-government organisation undertaking an audit of a comparison website to check for issues such as accuracy and completeness of information, and then providing some form of “trustmark” provided that the site reaches a certain standard. The success of such an initiative would depend on the ability of the body administering the trustmark to build a sufficiently strong reputation that website providers would see value in undertaking the accreditation process.

F6.5

The existing provisions in the Fair Trading Act in conjunction with the regular monitoring activities of the Commerce Commission provide sufficient oversight of comparison websites. Currently there is no need for a government-sponsored accreditation system for comparison websites.

Information disclosure

Information disclosure regulation is another approach that can help to increase transparency in service industries. Information disclosure is a relatively light-handed form of regulation that can empower consumers to make better informed decisions between competing service providers (MED, 2009).

Information disclosure was recently introduced for providers of KiwiSaver financial services (Box 6.6).

Box 6.6 KiwiSaver periodic disclosure requirements

The KiwiSaver (Periodic Disclosure) Regulations 2013 require all KiwiSaver schemes to regularly report on funds in a standardised way. The disclosure is presented on a 2-page form and includes information such as fund performance, fees and asset allocation. Under the regulations, KiwiSaver providers will publish on their websites quarterly and annual disclosure statements for each of their funds.

Part of the rationale for disclosure requirements was to increase transparency and let consumers compare different funds so they could make more informed decisions, and so help to facilitate a competitive market for KiwiSaver services. The regulations came into force on 1 July 2013, and the first disclosure statements were published in October 2013.

Source: MBIE, 2013a.

For mandatory disclosure to generate direct welfare gains, it is important that consumers can and in practice do take advantage of information disclosure to help them make informed decisions (MED, 2009). Hazards & Compass note that inappropriate information disclosure regimes can be counter-productive:

Industry guidelines and legislation about disclosure are made to try and address these information asymmetries. The premise of these rules is that if enough information is provided to the consumer, the effect of the information asymmetry will be reduced. However, too much information has the opposite effect – it overwhelms the consumer and leads to incorrect weighting of information. (sub. 16, p. 2)

To ensure that KiwiSaver disclosure information is relevant for consumers, the disclosure regulations also require KiwiSaver providers to publish information in a standard spreadsheet that analysts, commentators and investor information services can access. This will enable the information to be aggregated and presented in ways that consumers can more easily access. For example, the Commission for Financial Literacy and Retirement Income (CFLRI) is using the information as the basis for a new tool called *KiwiSaver Fund Finder* on their website (sorted.org.nz). The tool lets users easily compare management fees and how different KiwiSaver providers have performed. This information is supplemented with some CFLRI survey information about the range of services that each fund offers (Sorted, 2013).

The KiwiSaver periodic disclosure requirements and initiatives like Sorted's *Fund Finder Tool* have made KiwiSaver services more transparent, and should help to make the KiwiSaver market more competitive. BNZ's submission supports this view:

The recent KiwiSaver reporting reform should help to ensure consumers are able to easily compare fees and returns for funds, enabling them to make more informed, performance based decisions about whether to remain or switch to another scheme. (sub. 110, p. 2)

F6.6

Information disclosure requirements, in conjunction with accessible online presentation, can significantly improve the availability of information in complex service markets. Information disclosure regimes should be subject to a cost-benefit test as they can be costly.

One shortfall of the current approach is that each disclosure statement is published separately on the relevant provider website. Given that disclosure statements contain more detailed information about each fund than what is published on the Sorted website, gathering all disclosure statements in one online location would be a very low-cost way to give better access to existing information. The Commission understands that plans are already in place for all disclosure statements to be published on the Companies Office website from 1 December 2014.

Information disclosure requirements for third-tier lenders

New disclosure requirements are also being planned as part of the Credit Contracts and Financial Services Law Reform Bill (the Bill passed its second reading in April 2014). The reform is designed to provide better consumer protections against unscrupulous third-tier lenders (providers of personal non-mortgage credit who are not banks – sometimes referred to as “loan sharks”). Under the provisions in the Bill, lenders will be required to comply with the following disclosure requirements:

- disclosure of key information, and full terms and conditions of the consumer credit arrangements must occur before the contract is made (the present requirement allows for disclosure up to five working days after the contract is made);
- standard contract terms and key information must be on the lender's website;
- advice on dispute resolution and hardship provisions must be added to key information; and
- contracts must specify goods over which security for a loan is taken.

The disclosure requirements aim to allow consumers to make more informed decisions and to promote competition through disclosure that allows comparison of offerings (Office of the Minister of Consumer Affairs, 2012). Currently, New Zealanders can visit several websites to compare lending rates among banks, building societies and credit unions. By contrast, the Commission is not aware of any sources of comparative information on the lending rates of third-tier lenders.

F6.7

There is an absence of accessible comparative information about the services provided by third-tier lenders. Third-tier lenders will be required to disclose certain information if the Credit Contracts and Financial Services Law Reform Bill is passed. It would be beneficial if the information that the Bill mandates was compiled in a user-friendly online format. Several privately operated websites appear well equipped to do this.

Contract termination charges

The costs associated with the termination of a contract are common barriers to switching. Typically, long-term contracts allow the consumer to end their contract early and some contracts provide for early termination if a particular event stated in the contract occurs. When an early termination arises, the contract usually requires the consumer to pay an early termination fee which is, or is claimed to be, compensation for the losses the supplier will suffer because of that early termination (Consumer Affairs Victoria, 2010).

Although contract termination charges can have a “lock-in” effect (Vickers, 2003), most contract termination charges perform a legitimate economic function. For example, Westpac notes that term deposits provide funding certainty to a bank: “Where a bank charges an early withdrawal fee, generally it will be seeking to recover its administrative costs and the costs of alternative funding” (sub. 219, p. 4). Box 6.7 sets out three ways that contract termination charges can create benefits for consumers.

Box 6.7 Early contract termination charges and long-term contracts

Contract termination charges need to be understood in the broader context of three main benefits that long-term contracts provide to consumers.

- Contract termination charges provide businesses with greater certainty over revenue and profit streams. This means that businesses can provide services they might otherwise not have been willing to provide or to provide their services at a lower cost.
- Contract termination charges allow businesses to recover the additional costs incurred from a customer terminating early from the customer directly rather than spreading those costs across its customer base. This means that customers who see out the term of their contract are not penalised by higher prices for those customers who decide to end their contracts early.
- Termination charges provide for a greater range of contracts offered to customers, by spreading the costs associated with the provision of services over the life of the contract without significant up-front costs. Also, longer-term contracts can create fierce competition at the point where suppliers compete for new customers.

Source: Consumer Affairs Victoria, 2010.

Although contract termination charges can benefit consumers, they are likely to cause consumer detriment when fees are designed specifically to prevent switching and reduce competition. Some firms participating in the Commission’s business survey identified termination fees as a barrier to changing service provider. Of firms that considered changing one of their service providers but ultimately decided not to switch, just under 10% cited contract termination charges as a reason for retaining their original provider.

Addressing problematic contract termination charges

One approach to early termination fees and other restrictive contract termination terms is to consider whether they represent an unfair contract term. Consumer laws in Australia and the United Kingdom have provisions that prohibit unfair contract terms. Under Australia’s Competition and Consumer Act 2010 the grounds for determining whether a term is unfair are:

- the term would cause a significant imbalance in the parties’ rights and obligations under the contract;
- the term is not reasonably necessary to protect the legitimate interests of a party to the contract (the party seeking to rely on the term must prove that it is reasonably necessary); and
- the term would cause detriment to a party to the contract if it were to be applied or relied upon.

The ACCC and the Office of Fair Trading have used the provisions to remove from standard-form contracts unjustifiable exit fees and other termination terms that affect a consumer’s ability to switch service providers. Predominantly this was done by providing advice to companies, through persuasion and negotiated agreements rather than court action.

Following the introduction of the Competition and Consumer Act in Australia, the ACCC reviewed compliance with unfair contract terms laws and worked with businesses to amend problematic clauses in contracts.

Overall, the ACCC found a good level of cooperation from businesses during the reviews, leading to substantial changes by businesses to their standard form consumer contracts. This also led to some broader improvements to the general business practices in these sectors. (ACCC, 2013, p. 3)

Sarah Court (a Commissioner at the ACCC) noted at the Commerce Commission's *Competition Matters Conference* that the increased range of tools and remedies at the disposal of the ACCC (as a result of the Competition and Consumer Act) has moved Australia from lagging in the world to providing among the strongest protections for consumers.

In December 2013 the Fair Trading Amendment Act passed into law. This Act introduced into New Zealand similar unfair contract terms provisions to those contained in the Australian Competition and Consumer Act. The unfair contract terms provisions will come into effect 15 months after passage of the Fair Trading Amendment Act and will apply to new, varied or renewed standard-form consumer contracts. Standard-form contracts are the type that cannot be negotiated. Consumer contracts are those related to the supply of goods or services of a kind ordinarily acquired for personal, domestic, or household use or consumption.

The Fair Trading Amendment Act provides that a term may be considered unfair if it causes a significant imbalance in the parties' rights and obligations under the contract, is not reasonably necessary to protect the legitimate interests of the party who would be advantaged by the term, and would cause detriment (financial or otherwise) to a party if it were applied, enforced or relied upon. The Act also provides examples of terms that may be unfair, including a term that permits one party but not another to end the contract and a term that penalises one party for a breach or termination of the contract.

The Commerce Commission has indicated that it will provide guidance to businesses about unfair contract terms and that it will work with businesses to help them comply in the 15 months until the provisions in the new Act come into effect. It would be useful if this guidance included information about contract terms relating to the termination of a contract that would be considered "unfair" under the Fair Trading Amendment Act.

The amendments to the Fair Trading Act will not apply to business-to-business contracts unless the contract relates to the supply of consumer goods or services (eg, a personal gym membership contract paid for by a business would likely be covered).

Chapter 4 examined the role that the services sector plays in the economy and the extent to which services act as inputs into other forms of production within the economy. This work showed that a greater share of the output from the services sector is used by other firms as an intermediate input than is purchased by household consumers.

The volume of services purchased by businesses raises the question of whether there would be benefits from extending unfair contract terms provisions to business-to-business contracts. There has been some pressure from the Council of Small Business Australia for such a change to be introduced in Australia. The Commission is not aware of businesses raising any concerns about the use of unfair contract terms in contracts with service providers. However, it would be useful for MBIE to review the unfair contract terms provisions after they have had sufficient time to bed-in to identify any improvements.

R6.2

Unfair contract terms provisions introduced in the Fair Trading Amendment Act 2013 should be reviewed by the Ministry of Business, Innovation and Employment (MBIE) between two to four years after coming into effect. When this review is conducted MBIE should examine business-to-business contracting arrangements to establish whether there is any evidence of practices that are harmful to competition.

The industry-led approach to reducing switching costs for banking services

In some service markets industry groups have been pro-active in seeking ways to reduce switching costs for consumers. One example is the process for switching banks that Payments NZ has introduced (Box 6.8)

Box 6.8 Bank switching process

Payments NZ is a company set up by New Zealand's main banks to independently oversee banking

regulations, rules and standards and to help standardise the way transactions are handled.

Payments NZ introduced new rules to govern the process for switching banks in 2010. Under these rules a customer who wishes to switch banks fills in a standard 1-page form and gives it to their new bank. The new bank then contacts the old bank and together they organise the transfer of direct debit/credit orders within five business days.

The system is based on the premise that the most significant barrier to customers changing banks is the requirement to re-establish recurring payments. The switching process migrates all these payments without any customer action (beyond signing the 1-page form). The service is available for household banking and business banking.

The targeted 5-day turnaround time compares very favourably with bank switching processes in other countries. For example, bank switching processes in Ireland and the United Kingdom target 10 business days and 7 business days respectively.

Source: Information provided by Payments NZ.

Box 6.8 **Bank switching process**

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The system is based on the premise that the most significant barrier to customers changing banks is the requirement to re-establish recurring payments. The switching process migrates all these payments without any customer action (beyond signing the 1-page form). The service is available for household banking and business banking.

The targeted 5-day turnaround time compares very favourably with bank switching processes in other countries. For example, bank switching processes in Ireland and the United Kingdom target 10 business days and 7 business days respectively.

Source: Information provided by Payments NZ.

While the process for switching banks appears to be simple and streamlined, it is not well publicised. For example, a spokesperson for Kiwibank was reported as stating:

... most people aren't aware of how easy it is now to switch and that they don't actually have to do the work themselves. Therefore of the about 80,000 new customers Kiwibank gets annually, most do the work themselves. (Vaughan, 2012)

Results from the Commission's business survey also point toward a perception that switching banks is not straightforward. Almost 70% of surveyed New Zealand firms that had not recently changed bank cited the cost or inconvenience of switching as reason for their decision (Colmar Brunton, 2013).

Given that Payments NZ has already implemented the bank switching rules, it would be worth raising their profile. Payments NZ has already begun work towards that objective by publishing on their website a description of how the switching process works for consumers and a summary of the industry standards and protocols for switching that banks have agreed to.

Currently statistics on the number of consumers who switch banks are not collected. A further improvement to New Zealand's current bank switching service would involve regular publication of information showing the rate of consumer switching and the average time that switches took.

The Commission understands that Payments NZ has undertaken preliminary work to investigate the feasibility of publishing such information. Provided that the information can be collected and published at relatively low cost, it would be a beneficial addition to existing switching process. It would help to demonstrate the effectiveness of the process and give consumers greater confidence about the ease of switching banks – therefore sharpening the overall level of competition between banks.

R6.3

To demonstrate the effectiveness of the existing bank switching process Payments NZ should collect and publish statistics that show the number of bank switches each year and how long the switching process takes.

Reducing search and switching costs in other service markets

Compatibility costs arise where the decision to purchase a service locks in an ongoing requirement to use a complementary good or service or makes it hard for a consumer to use an alternative supplier. The following subsection examines compatibility costs that stem from barriers to portability.

Phone number portability

Since 1 April 2007, as a result of a determination by the Telecommunications Commissioner, customers have owned their telephone numbers and so can keep their existing number when switching service providers. Mobile phone number portability lets a customer change their provider but keep their number, including the cellular network access code (ie, 027, 021, 022). For landlines, local number portability lets a customer change their telecommunications provider but keep the same telephone number in the local calling area.

Telephone number portability has markedly reduced switching costs for consumers and strengthened competition among telecommunications providers. A report from the New Zealand Telecommunications Forum (TCF) in December 2012 noted that more than 600 000 mobile phone numbers had been moved from one network to another, while almost 400 000 local numbers had been moved (TCF, 2012a).

The Commerce Commission recently surveyed consumer switching behaviour in mobile and fixed-line telecommunications markets:

The Commission has historically focused on supply side indicators of the extent of competition. However, competition is also affected by demand side factors. If few customers are able and willing to switch their telecommunications service provider, this will hinder the ability of market participants to expand. (Commerce Commission, 2012b)

Some of the main findings from the survey were:

- 9.4% of respondents had switched their fixed-line provider in the last 12 months (compared to 6.8% in Australia);
- nearly 14% of mobile consumers had switched in the previous 12 months, and 37% of mobile customers had switched service providers at any time, compared with 43% in Australia; and
- respondents who had switched mobile service providers overwhelmingly indicated a positive customer experience of switching (Commerce Commission, 2012b).

Overall, the Commerce Commission concluded that the barriers to switching telecommunications providers are minimal.

F6.8

Phone number portability removed a significant barrier to switching and positively influenced competition in New Zealand telecommunications markets.

2degrees agrees that mobile number portability has had a considerable impact on the ability of mobile consumers to switch provider, but suggests that there “remain considerable switching barriers in relation to consumer postpay and business ... mobile markets. This limits the benefits of competition in these markets and associated productivity gains” (2degrees, sub. 217, p. 2). 2degrees further noted:

Given clear differences between each of the prepay, postpay and business markets, 2degrees considers that the Commerce Commission should conduct a switching study that considers each of these markets separately. Notably, the previous switching study ... was limited to consumer (not business) switching barriers (2degrees, sub. 217, p. 2).

The Productivity Commission’s analysis of services as an intermediate input in Chapter 4 shows that two-thirds of the output from the post and telecommunications industry is used by firms, while the remaining third is sold to household customers. Given the importance of telecommunications as an intermediate input for businesses, future studies into competition in the market (including any future assessment of switching costs) should, to the extent possible, include a sample of business consumers as well as household consumers.

R6.4

Government-funded studies examining competition in service markets should, to the extent possible, include business consumers as well as household consumers.

Email address portability

Donal Curtin’s submission suggests that the use of email addresses provided by an internet service provider (ISP) can create a barrier to switching:

There is one impediment to switching ... the absence of e-mail address portability. In many services (such as banking), and even in parts of the telco business (thanks to landline and mobile number portability), switching suppliers has become steadily easier. But not in the case of ISPs, where if a business has an ISP-specific e-mail address (eg `smallbusiness@xtra.co.nz`) it is a major headache to change supplier. Newer businesses are likely getting savvier about using non-ISP addresses (eg `smallbusiness@gmail.com`) or setting up their own domain names (eg `owner@smallbusiness.co.nz`), but there must still be a large legacy of SMEs for whom ISP switching costs remain excessively high. (sub. 108, p. 3)

As noted in the submission, the number of internet users who feel “tied” to their ISP due to their email address is likely to be relatively small because people increasingly use email services that are separate from their ISP. But for those customers who do use an ISP-provided email address, switching their ISP could result in a significant inconvenience – particularly if their email address is used for business purposes.

In contrast, Telecom suggests that the benefits from introducing email address portability would be outweighed by the costs:

While portability solutions undoubtedly deliver some benefits to end-users, they are typically very complex and costly for industry participants, requiring close coordination, and systems interoperability, between market participants... It’s difficult to envisage any material competition benefits from the proposed system given an already highly competitive broadband market... (sub. 221, p. 1–2).

The practice around ISP-provided email addresses varies. For example, Orcon provides an “email address for life” meaning that customers can continue to use their Orcon email address even if they are no longer a customer. Other ISPs will cancel email addresses when customers switch providers. In this situation, the only way for customers to continue to access their email is to keep some form of plan with their original ISP. In most cases the cheapest option is to keep a basic dial-up internet package that costs about \$20 each month.

The need to retain a basic internet package has been criticised as an overly costly solution (Pullar-Strecker, 2012). Some other jurisdictions are considering legislative changes to address email address portability barriers. For example, the European Commission has proposed a legislative package that includes a requirement for ISPs to forward emails to a new address after consumers switch:

End-users need to experience continuity when changing important identifiers such as email addresses. To this end, and to ensure that email communications are not lost, end-users should be given the opportunity to opt, free of charge, for an email forwarding facility offered by the transferring internet access service provider in cases where the end-user has an email address provided by the transferring provider. (European Commission, 2013b, p. 27)

It is unclear how many customers are affected by the lack of email address portability in New Zealand. In addition, options do exist for people to migrate their emails to a non-ISP-provided email service (such as Gmail, Outlook or registering a domain name). As such, a legislated mandatory email forwarding system as the European Commission proposes looks to be an unnecessarily heavy-handed response.

However, a lighter-touch option could be warranted. Although it is difficult to quantify the effect of email addresses portability on competition, the Commission considers that there are benefits to be achieved from reducing barriers to switching. Given the uncertainty about the magnitude of these benefits, any response would need to be accomplished at a low cost.

The organisation best positioned to establish whether a solution to this issue could be developed at sufficiently low cost is the TCF. TCF is a registered incorporated society made up of most of New Zealand's telecommunications providers. TCF's goal is "to promote competition for the long-term benefit of end-users of telecommunications services in New Zealand" (TCF, 2012b). TCF also operates an independent dispute resolution service that is available to residential and small business (less than 20 full-time employees) customers of telecommunications companies.

R6.5

The New Zealand Telecommunications Forum should investigate mechanisms to enable business and residential customers to switch internet service providers without losing access to emails. If a viable low-cost option exists it should be implemented.

Bank account number portability

Bank account number portability has been suggested as one approach to further reduce the costs of switching banks. In theory, this would work in a similar way to phone number portability. Advocates of such an approach argue that portability would increase the ease of switching among, and increase competitive pressure between, banks (Edmunds, 2013).

The Australian Treasury commissioned a report into switching arrangements in the banking sector that specifically examined the feasibility of account number portability in 2011. The report was unequivocal in finding that bank account number portability would need very expensive new infrastructure, the costs of which are likely to far outweigh any competition benefits from greater switching:

Full account portability is a deceptively simple concept ... Implementation of full account portability, however, would be far from simple, and not at all analogous to telephone number portability as sometimes suggested. It would involve the replacement of the bank, state, branch (BSB) system of numbering, and wholesale revamping of the existing payments infrastructure and the systems of all the financial institutions which interface with it. It would be a major and costly undertaking. (Fraser, 2011)

The report also noted that developing a bank account number portability system is so complex no other country has fully achieved it. The closest system is a "watered down" arrangement in Sweden.

Inquiry participants have noted that the infrastructure changes needed to introduce bank account number portability in New Zealand would be similarly costly.

F6.9

Full bank account number portability is not available in any country. There is no case to introduce it in New Zealand at the present time as the cost would very likely exceed the benefits.

Although full bank account number portability is not currently a viable option, it is plausible that alternative work-around options may be developed in future. New Zealand officials should monitor developments in other countries to assess how developments might be applied to the New Zealand market. For example,

banks in Australia worked on an account switching project between 2007 and 2011. The project was called “Me and My Bank Online” and aimed to issue individuals with biller numbers that would help to create a single identity for online payments. Such a system would mean that it would not matter if a customer moved banks or changed account numbers in the future. Ultimately the project was abandoned in 2011 after three of the four main banks withdrew their support, citing delays and cost overruns (Hopewell, 2011).

R6.6

New Zealand officials should monitor international developments in bank switching and account number portability. If another country develops a workable approach, officials should closely examine its applicability for the New Zealand banking system.

6.3 Occupational regulation and competition in professional services

This section considers:

- the role of professional licensing/registration regimes and of professional bodies in helping to support the functioning of competitive provision of professional services; and
- how those arrangements, if not well designed, can dampen competition.

Chapter 2 notes that information asymmetries and the complexity of some service transactions prompt governments towards extensive regulation of service industries.

Issues stemming from information asymmetry and complexity are likely to be greater where:

- the product is purchased infrequently; and
- the service involves complex or technical matters making it very difficult for a consumer to assess the quality of the service ahead of time, for example dental services.

These problems are not relevant to all services, for example restaurant services and hairdressing services. Most consumers buy such services frequently, can assess the quality of the service received at the time, and generally are reasonably equipped to do so. If there is a problem, the consequences are usually not significant. The consumer can simply choose a different service provider next time, and service providers are correspondingly subject to the disciplines of the marketplace.

In the case of professional services such as legal, accounting, and architectural services, this is much less the case. Most professional services are complex and bought less frequently. Also, consumers can face constraints on switching suppliers. For example, in the case of accounting services the client and the service provider typically need to invest time and effort in setting up the client relationship. Also, some professional “transactions” stretch over an extended time, which means that it may not be feasible to switch to an alternative service provider part way through the “transaction”. For example, it may not be sensible to change accountant part way through a tax audit.

Licensed professions and trades make up a significant part of the New Zealand economy. Between 380 000 and 480 000 providers of professional and trade services are required to be licensed, certified or registered. This corresponds to about 16% to 21% of the total labour force⁵⁵ (Martin Jenkins, 2012). This compares with an estimate of 19% to 40% of the workforce in the United Kingdom (the authors suggest that the true figure is more likely to be at the lower end of this range) and licensing requirements for about 29% of the workforce in the United States (Forth et al., 2011; Kleiner & Krueger, 2010).

Other considerations that point to the performance of markets for professional services being material for this inquiry are that:

⁵⁵ This includes some trades that might be thought of as being on the margins of constituting a licensed trade, such as bar managers and probably some double counting (where people hold more than one “licence”). But it does not include several trades and professions where data was not available.

- the professional, scientific and technical services industry has a low rate of productivity growth (Chapter 3); and
- professional services are an important intermediate input for goods exporters (Chapter 4).

Arrangements to uphold professional standards can be both enablers and inhibitors of competition

One foundation condition that must be met for a market to be competitive is that buyers and sellers are well informed (Vickers, 2003). The information asymmetry and barriers to switching in the markets for most professional services means that competitive processes tend to be weaker than in many other markets. For these reasons, markets for most professional services are subject to a degree of “professional discipline”, to make up for reduced “market discipline”. Professional bodies and “licensing” requirements provide such discipline. Professions themselves face incentives to establish the professional disciplines needed to help the market work. Without them, the members of the profession would be less able to sell their services.

Where professional standards are pitched too high, they can unnecessarily constrain supply and stifle the competitive functioning of the market. Professional standards that are too high can result from government prescription of unnecessarily high standards. Or, where a profession is self-regulated, the governing professional body can face incentives to act more in the interests of its (existing) members, also by setting entry standards unnecessarily high (Vickers, 2003). As in any market, barriers to entry for professional services can be a major barrier to market competition.

Similarly, professional bodies can face incentives to set post-entry standards on the low side. Those can be reflected in disciplinary and complaints procedures tilted in favour of existing members of the profession and against the interests of consumers, or minimal requirements for standards that apply at the time of entry having to be maintained after entry.

Achieving competitive markets in professional services that work well in matching the supply of services to the needs of consumers requires a balance between professional standards that are too high and too low.

Because professional bodies can have incentives to prioritise the interests of their members, government is usually involved to some degree in professional regulatory arrangements. Most professional bodies are recognised by statute, which brings with it some degree of government involvement and oversight. One role of government is to see that an appropriate balance is struck. It represents the “public interest” in seeing to arrangements that best support the functioning of a competitive market.

Professional licensing arrangements can be categorised along two broad dimensions:

- self-regulation versus statutory regulation; and
- licensing versus certification or registration.

Self-regulation refers to where the standards that apply to a profession are established and administered by a professional standard-setting body elected (mostly or entirely) by its members. Statutory regulation refers to the same function being performed by the Government or a predominantly government-controlled, or -appointed, body.

Licensing, certification and registration can be differentiated.

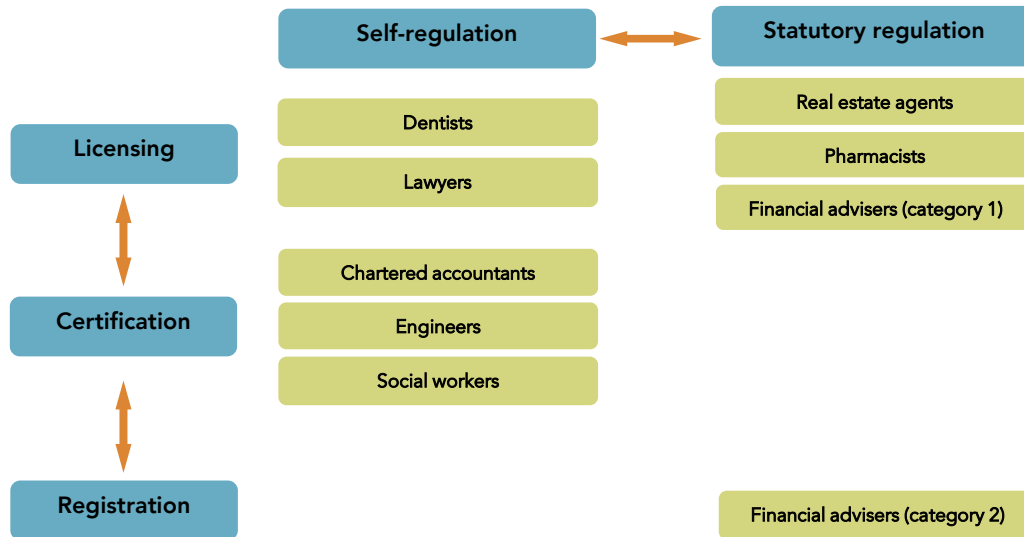
- Licensing refers to a legal requirement for a practitioner to be approved as meeting prescribed standards of competence and conduct to practise in defined areas of work.
- Certification refers to where a practitioner is recognised as meeting prescribed standards of competence and conduct, but that is not a requirement to legally practise (ie, uncertified people can still practise, but cannot represent themselves as being certified).
- Registration refers to a requirement that those performing prescribed services be recorded as such, but without having to meet significant pre-registration requirements or standards. Practitioners can be

removed from the register, and from practising, if they fail to meet base-level standards (UK Commission for Employment and Skills, 2011).

One main difference in the effects of these varied approaches is that a licensing regime creates a minimum level of quality that must be provided to all consumers. Certification and registration regimes allow for consumers to exercise more choice about the quality of service that they need, and are willing to pay for.

The boundaries between these different approaches to establishing professional standards are not precise. Yet professions can be categorised as falling (mostly) under one approach or another (Figure 6.2).

Figure 6.2 Classification of professional bodies (selected examples)



Source: Productivity Commission.

Notes:

1. The distinction between category 1 and category 2 financial advisers is discussed in Box 6.9.

Each approach involves different trade-offs in terms of the support provided for the functioning of a competitive market in professional services. Licensing regimes can be more effective in putting a floor under standards than registration regimes, but are also more prone to “capture” by the interests of the existing members of the profession, particularly where the regime is self-regulatory.

Conversely, more “open” certification/registration-type regimes create lower barriers to entry and therefore can be more conducive to fostering competition, and allow for a wider range in the quality of services on offer. In some cases (such as airline pilots), a wide range in the quality of services may be viewed as an undesirable outcome. But, for many services, allowing consumers some range of choice in the standard of service they need, and are willing to pay for, can improve how the market performs.

From the standpoint of wanting to promote competitive markets in the supply of professional services, these considerations point to the following three broad principles.

- A registration/certification regime generally will be more conducive to fostering competition than a licensing regime.
- Where best to pitch a regime for any particular profession depends importantly on judgements about the extent to which all members of the community require a minimum level of service/protection. If that results in higher prices than otherwise, it should also be recognised that some people may not be able to access any level of service.
- The closer a professional standards regime is to a licensing rather than a registration regime, the greater the need for the Government to be involved as the representative of the “public interest”.

Recent instances of reform of professional bodies in New Zealand have favoured a licensing approach rather than a registration approach. Examples are real estate agents and financial advisers. However, the

regime for financial advisers tailors the regulatory approach depending on the complexity of work provided (Box 6.9).

Box 6.9 Occupational regulation of financial advisers

The Financial Advisers Act (2008) established a two-tiered approach to regulation. Financial advisers are subject to different requirements depending on whether their advice relates to category 1 or category 2 products.

Category 1 products have an investment focus and include securities, land investment products, futures contracts and investment-linked insurance contracts. Category 2 products are generally less complex. They include products such as bank term deposits, bonus bonds, call debt securities and shares in cooperative companies.

Advisers whose work is limited to category 2 products are subject to relatively light-handed registration requirements. They must be registered on the Financial Services Providers Register and belong to a dispute resolution scheme.

To provide advice on category 1 products an adviser must become an Authorised Financial Adviser. This is a more rigorous licensing process and involves meeting certain standards of competence and character, in addition to the requirements that apply to registered advisers.

Source: Financial Markets Authority, no date.

The tiered regime for financial advisers essentially means that more robust checks are in place for complex financial advice, while the entry barriers are lower for advisers who only provide advice on less complex products. This model provides a useful example of how occupational regulations can be tailored so that the level of restriction matches the level of protection.

R6.7

The Government should consider the competition benefits of a regime based on certification or registration rather than licensing when reviewing existing, or considering new, arrangements for the regulation of providers of professional services.

R6.8

When the Government decides that licensing is required to provide a minimum level of protection to all users of a professional service, the activity that requires licensing should be prescribed no more broadly than is required to achieve that protection. This could be achieved by confining the licensing requirement to prescribed areas of "restricted work".

The role of professional bodies

As noted earlier, occupational regulatory regimes can be classified according to whether the regime is overseen by a self-regulatory professional body, or whether this function is performed by a government or government-appointed body.

There are advantages and disadvantages from having an industry body control entry and other aspects of occupational regulation as opposed to having government involvement. For example, an industry body might have expert knowledge, but potentially stands to gain by restricting entry to an occupation. In contrast, a government agency may have advantages in terms of impartiality but may lack relevant industry knowledge or be less efficient than an industry body (DPMC, 1999).

Given that industry bodies can be faced with incentives to prioritise the interests of their members over those of the public, they should be subject to certain checks and balances. Where the Government provides professional bodies with statutory recognition, it should ensure that the statute is explicit regarding matters including:

- governance of the profession, including the range of skills and expertise among the members of the profession's governing body;
- the level of minimum entry and post-entry standards;
- processes for dealing with consumer complaints and with disciplinary matters;
- provision of information, and reporting, to the public; and
- promoting competition.

The last of these matters – promoting competition – has not traditionally been a purpose of professional bodies. The roles of professional bodies generally have been understood in terms of maintaining professional standards, representing the interests of members of the profession, and in promoting the “public interest”. This last aspect has not typically included deliberately promoting a well-functioning and competitive market for the professional service.

Recent policy reforms in the United Kingdom have brought this aspect of the role of professional bodies more to the fore. A review of the regulation of the legal profession led to “promotion of competition in the provision of legal services” being included as one of the objectives of the Legal Services Act 2007.

An obvious question is how to give meaningful effect to this objective. The United Kingdom has established an (independent) Legal Ombudsman and a Legal Services Consumer Panel. These bodies have actively promoted competition within the legal profession, by providing guidance information and overseeing a channel to effectively respond to consumer complaints. The UK Law Society has established a “search-a-lawyer” database, making use of accreditation information and recognising expertise in specialist areas of the law.

The Legal Services Consumer Panel conducts regular surveys to measure the effectiveness of reforms from the perspective of consumers. This process is only into its third year so it is difficult to draw firm conclusions about the impact of legal services reforms. However the survey data point to some encouraging trends such as consumers being more likely to shop around for legal services, easier comparisons of legal providers and greater take-up of fixed-fee legal services. Yet the survey results also point to some areas of concern including a reduction in consumer satisfaction with the transparency of costs information provided by lawyers (UK Legal Services Consumer Panel, 2012).

The work of the UK Legal Ombudsman has challenged some of the more traditional views of legal services (Box 6.10).

Box 6.10 Changing views on the role of competition in legal services

The UK Legal Ombudsman, in its report *Costs and customer service in a changing legal services market*, commented:

We regularly are met with statements that people should have access to greater information to make them more effective consumers; possibly an easier challenge to meet in the context of swapping energy companies than in comparing costs for a bespoke legal service.

This is only part of the challenge though. Traditional views of lawyers as experts, separated from other businesses by this notion of professionalism, still dominate not just the legal sector but also general perception about legal services provision. And nowhere is the battle between the traditional view of client and customer more marked than in the notion of cost and pricing. The term ‘client’ embodies the traditional view of the relationship between lawyers and those they represent.

The notion of a consumer turns this relationship on its head. In most businesses, the consumer has the power and can choose which services to buy from which provider. The traditions of the law are different, though, and many lawyers have historically been able to treat the notion of customer service as somehow lesser than their professional obligations. What we are seeing now though are market changes forcing lawyers to face the possibility that their traditional view of how

they go about their daily work may have to undergo a fundamental change. Those who adapt to the market, it appears, will survive: those who cannot may be doomed to disappear. (Legal Ombudsman, United Kingdom, 2012, p. 5).

Should professional bodies in New Zealand be required to promote competition?

The regulatory objectives placed on professional bodies in New Zealand do not currently include any obligation to promote competition. For example, the New Zealand Law Society's regulatory powers and obligations are set out in the Lawyers and Conveyancers Act 2006. The Act does not contain specific reference to the promotion of competition (as in the equivalent UK legislation), but it does include two provisions relating to the protection of consumers of legal services:

- maintaining public confidence in the provision of legal services and conveyancing services; and
- protecting the consumers of legal services and conveyancing services.

Some of the main ways that the Law Society gives effect to its role of protecting consumers of legal services are set out in Box 6.11.

Box 6.11 How the New Zealand Law Society acts to protect consumers

One of the main ways that the Law Society gives effect to its role of protecting consumers of legal services is by providing the Lawyers Complaints Service which includes operation of a telephone line dedicated to receiving and responding to complaint inquiries. In the 2012/13 year 2 880 calls were made to the complaint line, 1 766 complaints were received and 1 947 complaints were closed (NZLS, 2013).

Complaints are considered by the Lawyers Standards Committee who can impose penalties if they determine that a lawyer's conduct was unsatisfactory. In some cases, a summary of the complaint and the resulting penalty is published on the Law Society website. At the time of writing, the website listed summaries of 67 cases for the years 2012 and 2013. In 15 of these cases the name of the lawyer in question is included, while the remaining cases are anonymised (NZLS, 2014). Most complaints do not result in the Lawyers Standards Committee taking any action; 68% of cases closed in 2013 did not result in any action being taken, and a further 12% of complaints were resolved through negotiation, conciliation or mediation (NZLS, 2013).

The Law Society also provides a range of information about legal services both on their website and at community law centres. For example, the Law Society has published an advice brochure entitled *Seeing a Lawyer – What can you expect?* They have also published brochures that provide advice on common legal issues such as buying and selling a property and making a will. The Law Society website also includes a "find a lawyer" service that lets users search for lawyers specialising in certain fields or with specific language skills. The "find a lawyer" service does not list the instances where penalties were imposed on lawyers as a result of consumer complaints.

Two submissions to this inquiry presented opposing views on the value of requiring professional bodies to promote competition:

Consumer NZ ... agrees a purpose for a governing body should be fostering a competitive market place... It also agrees that explicit in the expectations of those bodies (enshrined in legislation) should be their obligations to support competition, and complaints resolution and reporting. (Consumer NZ, sub. 221, p. 3)

We agree that competition is a desirable outcome in the legal professional service market, but we are very firm in our view that no specific statutory provision requiring the promotion of competition is appropriate within the present framework. (NZLS, sub. 213, p. 8)

Robust competition is an important driver of productivity in professional services. Greater competition incentivises providers to reduce prices and improve the quality of their services. Ultimately this improves the accessibility of these services to consumers (Terry, Mark & Gordon, 2012). In the case of legal services, improving access to justice is an important objective in the Ministry of Justice's performance improvement framework (SSC, New Zealand Treasury & DPMC, 2012).

R6.9 sets out some important design characteristics for any future instances where professional bodies are granted statutory recognition.

R6.9

When the Government gives statutory recognition to professional bodies, it should be explicit in legislation about its expectations of those bodies, including their approach to competency standards (both entry and ongoing) and their approach to complaints resolution and reporting.

When the Government gives statutory recognition to professional bodies, it should require that the governing boards of professional bodies include members from outside the profession, and members knowledgeable about consumer perspectives. Also, the promotion of competition should be included in the statutory objectives of the professional body.

For existing professional bodies, the Commission considers that a requirement to promote competition within their profession would be a beneficial addition to their role.

R6.10

The promotion of competition should be included in the statutory objectives of all professional bodies afforded statutory recognition.

7 Improving competition law

Key points

- Competition laws and the institutions that implement them – competition agencies and the courts – have an important influence on the behaviour of firms and on competition outcomes.
- New Zealand’s small market size, geographic isolation and the characteristics of many services make it important that competition law strongly supports competition in the services sector.
- A key component of a competition regime is preventing firms from misusing market power to damage competition and dynamic efficiency. Misuse includes improperly restricting the entry of new firms, preventing others from engaging in the market or eliminating competing firms.
- Section 36 of the Commerce Act 1986 aims to prevent firms misusing their market power. It was drafted to be similar to the parallel section in Australian law, but New Zealand courts have diverged from Australian courts in interpreting it. New Zealand’s highest court has come to rely solely on a “counterfactual test”.
- Sole reliance on the counterfactual test is problematic because it increases the risk that dominant firms escape sanction for conduct that suppresses competition and innovation. But any reform should still allow large firms to compete vigorously as part of the competitive process, and realise efficiencies beyond those possible for firms without market power.
- The Commission believes there is a strong case to review s 36 despite some opposition to change because of loss of certainty and the risk of unintended consequences.
- Potential gains from reform are increased dynamic efficiency by making it harder for firms with market power to suppress the competition and innovation offered by smaller and newer firms, and by clarifying that large firms can implement changes that improve efficiency.
- To help further the goal of a trans-Tasman single economic market, any review should take account of Australia’s current major review of its competition law.
- Competition law should not prevent firms from collaborating to become more competitive and efficient. The Commerce (Cartels and Other Matters) Amendment Bill includes an exemption for certain collaborative activities and a clearance regime for firms to check the lawfulness of proposals. An evaluation of the Bill, that includes consideration of how well it is understood by business, should be conducted after it comes into effect.
- Several approaches to examine competition in New Zealand markets currently exist. One shortfall of these approaches is that the Commerce Commission may only conduct market studies regarding the telecommunications industry. To address this, the Commerce Act should be amended to include a provision similar to s 9A (1) (b) of the Telecommunications Act 2001.

Competition laws and the institutions that implement them – the competition agencies and the courts – influence how firms behave. They affect the intensity of competition and, through that, productivity performance in service industries. This chapter examines areas of competition law that the Commission believes can be improved: s 36 of the Commerce Act (the unilateral conduct of dominant firms), collaboration among firms, and the power to conduct market inquiries. The Commission’s inquiry into regulatory design and practices, which is being undertaken in parallel with this inquiry, will make system-wide recommendations aimed at improving regulation in New Zealand. Some of these recommendations may be relevant to the competition regulator, the Commerce Commission, and competition policy agencies such as the Ministry of Business, Innovation and Employment (MBIE).

7.1 How the Commerce Act supports competition

The Commerce Act created a comprehensive and coherent competition law framework for New Zealand (Berry, 2012). The framework derived from and remains similar to the equivalent Australian competition statute, what is now the Competition and Consumer Act 2010. In turn, the Australian legislation has similarities to US antitrust law and competition laws in the European Union (including the United Kingdom).

A long-standing and important question is whether a competition law framework based on large-country models is appropriate for a small, remote economy such as New Zealand's economy. The core challenge is making the best trade-off between two desirable features: enough competitors to provide healthy competition; and firms of sufficient size to maximise efficiency and effectiveness through economies of scale (Berry, 2012; Conway, 2011; Gal, 2007). This is an economy-wide issue, but one that is particularly important for the services sector given the relatively low intensity of competition in many service industries (Chapter 5).

The ultimate objective of competition law under the Commerce Act is maximising the long-term benefit of consumers within New Zealand. Robust competition among firms is the means that is normally assumed to bring about productive, allocative and dynamic efficiency and, thereby, this objective (Chapter 2). The competitive process may result in fewer, larger firms. This is not in itself a concern providing firms stay within rules designed to safeguard competition, efficiency and consumer welfare.

The Commerce Act has four key provisions that promote competitive markets by prohibiting or severely constraining particular firm behaviours:

- s 27 – contracts, arrangements or understandings that substantially lessen competition;
- s 30 – price fixing between competitors;
- s 36 – taking advantage of substantial market power for anti-competitive purposes; and
- s 47 – mergers that substantially lessen competition.

The Commerce (Cartels and Other Matters) Amendment Bill is currently progressing through Parliament and is expected to be passed in 2014. It proposes some significant changes that will clarify the permitted boundaries between competition and collaboration. Under the Bill, those who collaborate to fix prices or quantities (indulging in cartel behaviour) will become subject to criminal sanction in addition to the existing civil sanctions. The Bill includes an exemption which enables collaboration for legitimate pro-competitive reasons and a process by which firms can check the lawfulness of proposed collaborative arrangements. These changes are discussed in section 7.3.

Section 36 prohibits firms with substantial market power taking advantage of that power for anti-competitive purposes. It has proved controversial in practice, with much of the criticism focusing on how the jurisprudence has developed. In a number of high-profile cases, the highest courts have found for defendant firms that the Commerce Commission saw as taking advantage of their market power. According to the critics, these cases demonstrate that s 36 is working badly and needs to be changed. Section 7.2 outlines the arguments in favour and against changing s 36. It also explains why the Productivity Commission believes that a review should be undertaken to consider whether changes to s 36 would enhance competition and efficiency in the economy, including in service industries.

7.2 Misuse of market power by single firms

Section 36 of the Commerce Act is the New Zealand provision for preventing the misuse of market power by single firms, also known as "monopolisation".

Some of the major cases under s 36 have involved service industries. For example, a string of cases in the 1990s and 2000s involved Telecom, the dominant incumbent telecommunications provider. These cases were each appealed to the Privy Council or the Supreme Court. In 2007 the Commerce Commission undertook a s 36 action against Bay of Plenty Electricity Ltd over electricity metering services. In the mid-

2000s Origin Pacific, a regional airline, complained to the Commerce Commission of anti-competitive behaviour by Air New Zealand (NZ Airports, sub. 118, p. 7).

What does s 36 aim to achieve?

Monopolisation provisions aim to prevent dominant firms⁵⁶ in a market from harming competition and preventing benefits to consumers that competition brings – efficiency, innovation and higher productivity. Monopolisation provisions are intended to allow large firms to exploit scale economies and to compete vigorously, so long as they do not harm competition and economic efficiency.

Healthy competition – that promotes dynamic efficiency as well as productive and allocative efficiency – can take different forms. The form that delivers the maximum long-term benefit to consumers needs to be allowed to emerge and play out. This form will vary over time and depend on factors such as the size of the market, economies of scale and the rate and nature of technological change in products or their means of production. Two polar forms of competition are:

- A robust contest for customers among many similarly-sized, smaller firms, with none having significant market power. This *atomistic* competition drives down prices and/or drives up quality in line with consumers' preferences, and results in enough product variety to cater for the varied tastes and needs of consumers.
- A single, or very few, large firm(s) dominate the market because these firms have succeeded in developing breakthrough technologies or processes that satisfy consumer preferences in superior ways to old technologies (eg, smartphones replacing older mobile handsets). These firms enjoy temporary monopoly power as a result of a process that economists call *creative destruction* (Chapter 8). The lure of achieving this power and its associated profits – if only for a period – is a potent incentive for firms to compete in races to innovate. This process is dynamically efficient and can have high welfare benefits for consumers.

The second form of competition is sometimes tricky to distinguish from a situation in which a monopolist takes advantage of its power to harm competition. This is where monopolisation provisions come into play. As noted, it is desirable to allow large firms to exist and even charge prices well above production costs for a period – as a reward for exceptional innovative achievement. It is not desirable for them to use their market power to damage competition and reduce dynamic efficiency, for example by obstructing the entry of new firms or eliminating existing firms.

There is an important distinction between large firms acting intentionally and anti-competitively to exclude others, and firms competing vigorously (through offering superior price and/or quality to consumers) even though this may also result in other firms failing or not launching.

Drafters of monopolisation laws, competition agencies and courts face the difficult task of making these distinctions work in practice. The key criterion should be dynamic efficiency and the long-term benefit of consumers. These outcomes are difficult to observe directly. This is why healthy competition – as described above – is the yardstick that the law, the competition agencies and judges normally apply. But in doing so it is important that they do not overly focus on the atomistic form of competition and neglect the creative destruction form.

Box 7.1 compares New Zealand's legislative provision on monopolisation with parallel provisions in Australian law. The courts in each country interpret the legislation when legal disputes arise. This generates each country's *jurisprudence*, which can vary even where the written law is similar because each country's courts can interpret the written law differently.

New Zealand's jurisprudence on monopolisation has been strongly criticised for diverging from the approach in Australia and even more from countries with broader criteria for determining violations, including the economic *effects* of a dominant firm's conduct (Ahdar, 2009; Gavil, 2013).

⁵⁶ The language in s 36 is "firms with substantial market power" rather than "dominant firms". A 2001 amendment to the Commerce Act changed the "dominant" criterion to "substantial market power"; the latter being considered a lower test.

Box 7.1 Monopolisation provisions in New Zealand and Australia

Section 36 (2) of the New Zealand Commerce Act prohibits anti-competitive conduct by dominant firms:

A person that has a substantial degree of power in a market must not take advantage of that power for the purpose of

- (a) restricting the entry of a person into that or any other market; or
- (b) preventing or deterring a person from engaging in competitive conduct in that or any other market; or
- (c) eliminating a person from that or any other market.

Section 36 is essentially based on the monopolisation provision (s 46) in Australia's Competition and Consumer Act. The provision in s 46 was substantially amended in 2007 and 2008 with further clauses added in new subsections. Yet the main part of s 46 is unchanged and is very similar to s 36:

Section 46 – Misuse of market power (Australia)

A corporation that has a substantial degree of power in a market shall not take advantage of that power in that or any other market for the purpose of:

- (a) eliminating or substantially damaging a competitor of the corporation or of a body corporate that is related to the corporation in that or any other market;
- (b) preventing the entry of a person into that or any other market; or
- (c) deterring or preventing a person from engaging in competitive conduct in that or any other market.

The Australian Trade Practices Act 1974 (now the Competition and Consumer Act) was significantly influenced by the two key pillars of US antitrust legislation – the Sherman Antitrust Act 1890 and the Clayton Antitrust Act 1914. Both Acts aim to protect competition and the competition landscape, not competitors. This objective is also central to Australian and New Zealand competition law.

Australian and New Zealand jurisprudence and legislative amendments

Australian jurisprudence, before the significant 2007 and 2008 amendments to s 46, developed a "counterfactual test". The High Court of Australia's foundation case for this test is *Queensland Wire Industries Pty Ltd v Broken Hill Pty Co Ltd* (1989). The majority judgment in this case considered that "a firm will not have taken advantage of its market power if it would have acted in the same manner in a competitive market".

This counterfactual test has played a central role in subsequent cases in Australia and even more so in New Zealand. Yet important differences have emerged in the jurisprudence of the two countries.

Australian jurisprudence developed tests in addition to the counterfactual test, such as the "materially facilitated" and "direct observation" tests. These tests focus on the link between a firm's market power and its conduct, while the counterfactual test hypothetically assumes the firm lacks substantial market power. Yet even with the additional tests, controversies persist.

New Zealand's jurisprudence on s 36 developed through two Privy Council cases and a Supreme Court judgment in 2010 (*Commerce Commission v Telecom Corporation of NZ Ltd*, also known as the 0867 case). In each case, the court found against the contention that s 36 had been breached. The courts relied almost exclusively on the counterfactual test for determining whether the firm in question had "taken advantage" of its market power. The Supreme Court in 0867 noted:

Anyone asserting a breach of s 36 must establish there has been the necessary actual use (taking advantage) of market power. To do so it must be shown, on the balance of probabilities, that the firm in question would not have acted as it did in a workably competitive market, that is, if it had not been dominant (*Commerce Commission v Telecom Corporation of New Zealand Ltd*, 2010, paragraph 34).

The 2007 and 2008 amendments to Australia's s 46 make even clearer that the Australian courts are not confined to a strict counterfactual approach. The amended legislation provides that the court may have regard to four different tests only one of which makes overt use of counterfactual analysis to determine whether monopoly power is being used for an anti-competitive purpose.

Australia and New Zealand stand apart from other countries in relying solely on purpose/use tests in their approaches to monopolisation – as opposed to also considering the *effects* on competition. Yet New Zealand, in relying only on a counterfactual test, stands even more apart.

The debate over how to deal with monopolisation

Monopolisation provisions are difficult to get right and contentious in many countries.

It is drawing the line between pro-competitive competition “on the merits” and anti-competitive abuse of market power that can be very difficult. (Meech, 2010)

Distinguishing between legitimate commercial behaviour and abuses of market power has always been a difficult area of competition law. The Commerce Act has a significant impact on market behaviour and it must strike the right balance between deterring anti-competitive conduct and promoting beneficial competitive activity. (Telecom, sub. 218, p. 3)

There is no agreed best way to deal with monopolisation.

Issues raised by supporters of s 36 and its judicial interpretation

Certainty

Changes to s 36 or its interpretation may cause uncertainty for large businesses about which business practices are permitted. This uncertainty could discourage innovation and other legitimate competitive activity. The New Zealand Supreme Court has highlighted the importance of providing reasonable certainty, noting that:

It is important when addressing the statutory concept of use of market power to take an approach which gives firms and their advisers a reasonable basis for predicting in advance whether their proposed conduct falls foul of s 36 and risks a substantial financial penalty. (*Commerce Commission v Telecom Corporation of New Zealand Ltd*, 2010, paragraph 30)

In *Air New Zealand's* view, the current s 36 approach provides a high level of certainty.

The current purpose-based factual/counterfactual approach provides firms with a high degree of certainty regarding their business decisions, as purpose can generally be assessed at the time the decision is made. (*Air New Zealand*, sub. 220, p. 1)

It can also be argued that the courts have enhanced certainty under the present s 36 by developing detailed rules that provide guidance in relation to common monopolisation issues such as predatory pricing and margin squeezes.⁵⁷

Avoid chilling pro-competitive behaviour by large firms

If the law creates uncertainty or sets a low threshold for judging that a dominant firm has acted anti-competitively, then large firms may be deterred from vigorously competing and striving to outperform their rivals, to the detriment of dynamic efficiency and long-term consumer benefit. The EU approach to monopolisation puts a “special responsibility” on dominant firms not to distort competition (European Court, 2012, paragraph 23) and may have a similar detrimental effect.

⁵⁷ A margin squeeze occurs when a monopolist controls wholesale and retail prices in a market and sets them to squeeze the mark-up margin to the point of making it unprofitable for another firm to operate. The rule in this case is to ask could an efficient rival compete given the combination of wholesale and retail prices set by the monopolist?

Effects-based tests are costly

Replacing the counterfactual test with a test that relies on a comprehensive analysis of the economic effects of a large firm's behaviour would require onerous information gathering and analysis. While jurisdictions such as the United States may have the market size to justify, and resources to undertake, such research, New Zealand does not. Further, there is a risk that an effects test will inhibit legitimate competitive conduct by large firms and end up protecting weak and inefficient competitors rather than safeguarding dynamic efficiency. Shutting down inefficient firms and redeploying resources to more valuable uses is an important part of the competitive process.

No compelling case to change

Those in favour of retaining the status quo argue that no one has made a compelling case for change based on empirical evidence. For change to be warranted, it needs to be shown that justified cases have either failed or not been brought because of too lenient a standard, or have been needlessly convoluted and/or confused, and therefore prone to error. In addition, it needs to be shown that any problems such as these have caused significant detriment to the long-term interests of consumers.

Issues typically raised by advocates of the need to reform s 36

Risk of false-negative outcomes

A false-negative outcome occurs when the monopolisation test falsely indicates that a firm has not taken advantage of its power and damaged competition. Critics of s 36 and its jurisprudence argue that the counterfactual test is too difficult to satisfy because it is too easy to find reasons why a firm without power would have acted in a similar way to the alleged misconduct. False negatives enable large firms to misuse their market power to damage competition. One consequence is that new firms with the potential to drive innovation and dynamic change in markets may not launch or survive.

Risk of false positive outcomes

A false positive occurs when the monopolisation test falsely indicates that a firm has taken advantage of its market power and damaged competition. For example, suppose that a firm's market power enables it to impose supply-chain standards on its suppliers that cut transaction costs and raise productivity. This action would not be feasible for a similar but non-dominant firm. Therefore a mechanical application of the counterfactual test will indicate that the firm has taken advantage of its market power despite its actions leading to a better economic outcome. The harm from false positives is that the benefits from such actions of large firms are not realised.

The counterfactual test is complex, artificial and has a flawed logic

It is often difficult to construct a hypothetical market where the defendant firm is not dominant and consider what that firm would do because the features of such an artificial market are open to debate. It is a more complex test than other provisions in competition law (eg, s 27 or s 47 of the Commerce Act) that compare not firm behaviours but market outcomes with and without a proposed change (such as an arrangement or merger). The flaw in the logic of the counterfactual test arises because of the limited conclusions that can be drawn from the (hypothetical) observation that two similar firms, but for the market power of one, are acting in the same way. In particular, the effects on competition and dynamic efficiency flowing from the act may be quite different depending on the existence of market power, so little can be inferred about consequences.

Effects are of the essence

Conduct undertaken by a single non-dominant firm in a competitive market will have either a neutral or small positive effect on consumers. In contrast, similar conduct by a dominant firm might well have an anti-competitive effect and cause consumer harm. So the real assessment of harm from market power requires an examination of effects in the market. Such an assessment is called for, and is applied without undue difficulty under s 27 of the Commerce Act, relating to arrangements between firms that substantially lessen competition. Examining how a dominant firm would have acted in a hypothetical counterfactual competitive situation, without regard to the effects, puts the focus in the wrong place.

The competition regulator is unhappy with s 36

New Zealand's competition regulator, the Commerce Commission, is unhappy with the courts' current interpretation of s 36. The Commission is not a policy body, but is the agency charged with administering and enforcing the Commerce Act. The Commissioners and staff are expert and experienced in competition issues and accordingly deserve a close hearing. A competition lawyer, Neil Anderson of Chapman Tripp, recently voiced concern about the Commission's dissatisfaction with s 36:

... we can all agree that we want section 36 in a form that the regulator charged with administering it is prepared to do so. That is currently not the case. The Commerce Commission has put section 36 in the too hard basket, and that is not good for anyone. (Anderson, 2014, p. 1)

Box 7.2 outlines the Commerce Commission's position on s 36 and how it responded to the outcomes of two high-profile cases in which it prosecuted Telecom NZ, in one instance successfully and the other unsuccessfully.

Box 7.2 The Commerce Commission and s 36

The Commerce Commission's view is that s 36 requires legislative reform to make it a workable tool for tackling single-firm misuse of market power. Mark Berry, the Commission Chair, is unequivocal in his view of the need for reform:

For the moment, New Zealand monopolization law sits in an unfortunate position. While the legislative provision itself demonstrates no particular problems, the judicial analysis of it has seriously narrowed its application. Pragmatically, the only way forward is for an amendment to section 36. Hopefully, any such legislative review will not be confined to the potential adoption of the revised monopolization provisions now contained in section 46 of the [Australian] Competition and Consumer Act. counterfactual analysis is unreliable and controversial in its application. (Berry, 2012, p. 27)

The Commerce Commission's concern is that the court's threshold of proof is too high – to the point that prosecuting firms under s 36 is only a practical proposition when the anti-competitive behaviour is egregious. In the light of the Supreme Court's judgment against the Commission's position in the 0867 case, the Commission stated it would no longer issue guidelines on s 36 as it saw limited value in doing so. Noting this, Meech (2010) commented that if the Commission's view is that greater flexibility in the application of s 36 is desirable, the only way to achieve that would be by legislative amendment. Berry (2012) is also very clear about this.

The decision of the Supreme Court in 0867 has serious implications for section 36. The application of monopoly rules based on hypothetical thought experiments, involving the creation of make-believe market structures and predictions of behaviour in make-believe worlds, is highly problematic. Section 36 is in urgent need of amendment.

A properly informed review of section 36 will require an international survey of the subject. There is no easy solution to the problem; indeed the history of antitrust reflects a "continuing, and perhaps never ending, search for an appropriate (monopolization) rule." In any such review, close consideration should be given to U.S. monopolization law which focuses upon the likely or actual competitive effects of the defendant's conduct. At the least, such a test endeavours to address the real-world harm that may attach to monopolistic conduct, and this is clearly preferable to hypothetical thought experiments. (Berry, 2012, pp. 28, 39)

The Commerce Commission has stuck to its view despite successfully prosecuting Telecom Corporation in a subsequent action – the so-called "data tails" case. In 2012 the Court of Appeal upheld a lower-court decision that Telecom had, from February 1999 to late 2004, unlawfully taken advantage of its market power to charge downstream competitors disproportionately high prices for wholesale access to its network. This prevented competitors from offering retail end-to-end high-speed data transmission services at a competitive price. The Court of Appeal also upheld the record \$12 million penalty imposed by the Commerce Commission.

New Zealand's small market and remoteness

Both sides raise New Zealand's small markets and isolation as reasons for favouring their views. Supporters of s 36 and its judicial interpretation argue that New Zealand has higher concentration in its markets, which is to be expected and is desirable if firms are to achieve economies of scale. Overly zealous action against large firms risks them not prospering to the detriment of the economy.

Conversely, advocates of reform point to low intensity of competition and innovation as likely reasons for New Zealand's relatively weak productivity performance. New firms are a critical source of innovation in technology and business models. They can be a threat to large existing firms who use a variety of tactics to try to neutralise the threat. Monopolisation law needs to be effective to ensure that these tactics, while they may harm newer rivals, do not harm competition and undermine dynamic efficiency.

The Productivity Commission's view

Section 36 should be reviewed

The Productivity Commission's view is that there are real and valid concerns with how the current law and jurisprudence on s 36 are operating. These concerns justify a thorough review of s 36 that draws on international and domestic expertise and takes account of a full range of business and consumer perspectives.

The guiding principle of the Commerce Act – to foster dynamic efficiency to serve the long-term interests of New Zealand consumers – should be a touchstone of the review. In practice, this entails a review that seeks rules that better test the dynamic-efficiency consequences of unilateral actions of large firms.

The Commission would have liked to recommend a clear way forward on s 36, rather than propose a further review. However, a more thorough review is required than would have been possible in this inquiry. Box 7.3 describes the views of a number of submitters on a review of s 36.

Box 7.3 Submitters' views on a process to review s 36

Several submitters commented on the merits of a review and stressed the importance of a good review process.

Given the complexity of the issue, and the competing views from different sides of the debate, we consider that it is vital that before any specific recommendations on amending the Commerce Act's market power prohibitions are provided to Government that a transparent and rigorous consultation process is performed so that recommendations have legitimacy in the eyes of affected stakeholders. (Russell McVeagh, sub. 208, p. 5)

Sound evidence based regulation, whether retaining the status quo or amending it, will potentially contribute the most to New Zealand's productivity performance. (Telecom, sub. 218, p. 5)

[A]buse of dominance/misuse of market power laws are notoriously complex and getting the law "wrong" in this area can be very costly for businesses, consumers and ultimately detrimental to the economy as a whole. Accordingly, should a review of section 36 go ahead, the best course would be for the Government to establish a small, independent review panel consisting of senior business-people, regulators, economists and lawyers (similar perhaps to the Ministerial Inquiry into Telecommunications). That panel should be able to conduct workshops with interested parties, as well as receive written submissions. (Bell Gully, sub. 210, p. 1)

Any proposals regarding improving competition law should be subject to more widespread and detailed consultation before any specific recommendations for reform are made. Such consultation should take the form of a dedicated consultation on potential reform of the Commerce Act which would allow for the views of affected stakeholders to be taken into account. (Westpac, sub. 218, p. 6)

The Commission agrees on the importance of having a good review process – one that sifts the arguments and evidence, builds an understanding of the issues, and uncovers the best option for New Zealand. Such a process would also help to promote broad acceptance of the chosen option.

Several arguments led the Commission to conclude that a review of s 36 is warranted.

- A primary argument is that the s 36 counterfactual test is not well-suited, from the perspective of dynamic efficiency, to acting as a good “sorter” of conduct by dominant firms. The current approach runs a significant risk of false negatives and some risk of false positives (Gavil, 2013). The test’s failure to act as a good sorter flows from difficulties mentioned previously – the complexity of gauging hypothetical conduct, and the weak conclusions that can be drawn about dynamic efficiency simply on the basis of whether the conduct of a firm in the same position but without market power would have been similar.
- When sorting errors occur they are likely to be costly for the economy. A high-level conclusion that the Productivity Commission has drawn from this inquiry and related research is that low intensity of competition is an important contributor to New Zealand’s sub-par productivity performance particularly in the services sector. False-negative errors exacerbate this effect because they allow large firms to suppress competition and innovation from new, smaller firms. False-positive errors harm productivity by undermining the potential contribution of large firms to dynamic efficiency through innovation and using scale to lower costs. The incidence of errors and the cost of errors from an inaccurate monopolisation rule is likely to be higher in New Zealand compared with larger economies. This is due to greater levels of concentration, and a weaker tendency of markets to self-correct because of higher entry barriers, and consumers having fewer choices (Gal, 2007).
- The Productivity Commission is not concerned that the current s 36 approach involves a counterfactual test as such. As a submitter has pointed out, several parts of the Commerce Act rely on counterfactual tests:

All the tests use some counterfactual. In New Zealand, assessments of breach are based upon a counterfactual to answer the question what would be the outcome if the conduct in question did, or did not take place (Professor Lewis Evans, sub. 222, p. 2)

The s 36 counterfactual test causes problems because it focuses on the *actions of firms* in the hypothetical counterfactual world where a firm lacks substantial market power rather than on *market outcomes*. Actions are not only harder to pin down, they are also unreliable proxies for market outcomes (in particular whether dynamic efficiency has been preserved or impaired). Other counterfactual tests, such as those used in s 27 and s 47 involve directly examining whether the market effect of a substantial lessening of competition would result from an event such as an arrangement or a merger. While there ought to be no presumption that the test for assessing multilateral arrangements (among firms) should be the same as the test for unilateral conduct, the s 27 and s 47 tests do have a stronger logical foundation.

- New Zealand jurisprudence on s 36, in relying almost solely on the counterfactual test, is unique among comparable countries. New Zealand jurisprudence now differs from Australia’s approach (not without its own controversies), where the jurisprudence and legislative amendments provide a range of tests for whether dominant firms are behaving to the detriment of competition in a market.
- While the current approach may deliver a desirable degree of certainty, it does so only by effectively setting a very high threshold for what counts as a transgression. The price paid for this certainty is the risk of damage to dynamic efficiency from a too-lenient test that allows dominant firms to indulge in and behave in exclusionary ways.
- In its 2012 freight inquiry on the issue of access to monopoly-owned infrastructure, the Commission noted that “significant difficulties remain in using s 36 to require access to infrastructure in order to provide a competitive service” (NZPC, 2012a, p. 264). A review would provide an opportunity to assess whether New Zealand’s law on access to infrastructure could be improved.

The Commission is not convinced, as some participants have suggested, that the difficulties with s 36 have largely become academic because monopolisation issues tend to arise in areas that are now subject to industry-specific regulations such as the Telecommunications Act 2001 and Part 4 of the Commerce Act.

With these changes taking care of the problem areas, the argument goes, there is unlikely to be a net benefit from reforming s 36.

The Commission's view is that there remains a strong case for general competition policy to be as effective as possible, regardless of whether there are some specific industries and issues that justify separate regulatory intervention. Moreover, poorly functioning competition laws invite further industry, and even firm-specific, regulation which may not be in the interests of dynamic efficiency and the long-term interests of consumers.

In addition, the economic landscape is ever shifting and likely to throw up new challenges to competition and misuse of market power. One example, described in Chapters 8 to 11, is the revolution in products, services, business models and market structures that ICT is bringing about. These changes will likely feature large economies of scale and network effects and thereby raise competition issues. The Commission believes that it is important to have a s 36 that is fit for purpose to tackle unpredictable future developments.

F7.1

The current law and jurisprudence under section 36 of the Commerce Act is not working well and risks causing losses of dynamic efficiency through failing to identify some cases where firms use their market power to restrict the ability of other firms to innovate and compete.

The approach to reviewing s 36

A review of the current law should include a thorough legal and economic analysis of the costs and benefits of behaviour encouraged or enabled by the current interpretation of s 36. A good framework for assessing the benefits and costs of different legal rules is error-cost analysis (Box 7.4). It could be used as a guide for evaluating rough probabilities and costs of potential false negatives and positives under both the current s 36 and potential reform alternatives.

Box 7.4 The error-cost analysis approach to finding a good monopolisation rule

The Commission supports the use of a form of error-cost analysis (based on decision theory) to ascertain whether a superior monopolisation rule exists to the current approach under s 36. Error-cost analysis provides a systematic framework that evaluates rules primarily according to their probability of leading to errors (false negatives and false positives), and the seriousness of errors when they occur.

The best monopolisation rule is one that maximises the overall objective of the competition regime – in New Zealand's case this is the long-term benefit of consumers (largely a function of productive, allocative and dynamic efficiency). The error probabilities of different rules, and the size of the costs of errors have a direct influence on the extent to which the rules promote this overall objective.

Other important dimensions of rules that need to be evaluated are:

- What costs do rules create through the over- or under-deterrence of other firms?
- What transaction costs are incurred in operating the rule, such as information that must be gathered, dealing with complexity, and litigation costs?
- Does the rule allow decisions to be made quickly and easily in many cases before in-depth, costly information needs to be gathered?
- How clear and certain is the rule so that firms know in advance where they stand?

Error-cost analysis provides a rational framework to assess alternative rules. But it does not settle all questions. Typical topics of debate include the probability of firms acting harmfully, the magnitude of harms, the competence of courts and regulators to apply rules correctly, and the power of markets to

self-correct any errors that occur.

Source: Beckner & Salop, 1999; Salop, 2006; Baker, 2013.

Some commentators have already proposed alternative monopolisation rules to consider, such as a multi-stage, composite test or a different version of the counterfactual test based on the notion of an equally matched rival (Ahdar, 2009).

The Commission is open-minded about the best alternative approach to the current s 36. As a starting point, it views the single counterfactual test as a poor guide for differentiating between desirable and undesirable conduct by dominant firms.

An alternative is some form of direct assessment of market outcomes (ie, effects) as a result of the impugned conduct. Yet sole reliance on an effects test such as a substantial lessening of competition (SLC) would be too broad and open, and thereby fail to provide reasonable certainty for large firms. Conversely, in some cases an SLC test may inappropriately condone anti-competitive conduct. For example, a monopolist might arbitrarily eliminate a party from a market (for example, by refusing to supply a required input) without necessarily lessening competition to a substantial degree if other participants remain.

In the Commission's view any expansion in the type of conduct in breach of the law must be clearly based on the ultimate goal of the long-term interest of consumers through maximising overall economic efficiency. Accordingly it is favourably disposed to an efficiency defence in any new approach. This means that a firm with substantial market power could argue that its conduct is justified, if its conduct creates sufficient benefit through lower costs, greater innovation etc. This defence could require a public benefit test similar to that used in other parts of the Commerce Act, or a test based on "legitimate business reasons" where these can be taken as reliable proxies for net public benefit in the sense of long-term benefit to consumers.

A review should take account of the smaller size of and more limited competition in New Zealand compared to other economies. Small market size means that in many New Zealand industries a larger market share is taken by a few large firms – a more concentrated structure. This is appropriate to enable more firms to achieve the scale necessary to be efficient. New Zealand's competition policy accordingly is more tolerant of such concentration than policy in most larger economies. The downside is that New Zealand suffers greater risk from dominant firms behaving anti-competitively.

To summarise points made earlier, a review needs to consider important design questions such as the following:

- Should there be a purpose requirement that the firm in question intended to exclude other firms from competing; and should purpose be assessed subjectively or objectively?
- In terms of use (ie, taking advantage) of market power, should a more flexible approach be adopted, rather than relying on a single counterfactual test? Or should the use test be removed entirely?
- Should the test have an "effects" limb? For example, does the conduct have the effect of substantially lessening competition (SLC)? Such a limb would align with the SLC tests in s 27 and s 47 that are familiar to businesses, their advisers, the regulator and the courts.
- Should a new test explicitly provide for an "efficiency" defence? The purpose would be to reduce the risk of false positives when large firms use their market power to improve dynamic efficiency but, in doing so, lessen competition.
- Should a general test be supplemented by specific statutory tests in relation to specific forms of conduct such as refusals to deal or predatory pricing?

Australia's review of competition law

The Australian Federal Government has embarked on a "root and branch" review of its competition law. The terms of reference of the review are comprehensive and include monopolisation and the issue of

whether to move in the direction of “effects” analysis and tests. Without ignoring the distinctive economic features of New Zealand, any New Zealand review of its competition law should take account of developments in Australia. A desirable aim would be for the two countries to align their approaches within a single trans-Tasman market. The benefits of doing so would be to:

- lower a “behind-the-border” barrier to trans-Tasman investment, since trans-Tasman firms would need to be familiar with broadly similar competition regimes across Australasia; and
- enhance the existing spill-over benefits from sharing the knowledge and experience across countries with similar laws, institutions and judicial thinking.

R7.1

The Government should review section 36 of the Commerce Act 1986 and its interpretation. The review should consider whether other approaches offer greater accuracy in identifying situations where firms have taken advantage of market power and damaged dynamic efficiency with consequent detriments to competition, innovation and/or productivity.

R7.2

The review of s 36 should take account of the review of competition policy in Australia, with a view to achieving a consistent approach that:

- furthers the goal of a single trans-Tasman economic market; yet
- still suits New Zealand’s characteristics such as its small domestic market.

R7.3

The review of s 36 should include consideration of the merits of:

- a more flexible approach where courts do not rely on a single counterfactual test for an abuse of monopoly power;
- more of an “effects” approach to gauge whether conduct has harmed dynamic efficiency, and
- providing for an efficiency defence in cases where the conduct of a firm with substantial market power fails a primary test that it is harming competition.

7.3 Productivity-enhancing collaboration

The earlier sections of this chapter focus on the importance of robust competition as a driver of productivity and innovation in the services sector. While competition is an important driver of innovation, collaboration between firms is often a pre-requisite to achieving the necessary scale and mix of capabilities required for successful innovation. A tension exists between the promotion of competition and collaboration between competing firms.

This section examines how this tension is managed and considers initiatives that can help to foster more collaborative innovation without compromising competition.

Why does innovation matter?

The importance of innovation is well documented:

There is considerable evidence that innovation plays an important role in shaping the growth and competitiveness of firms, industries and nations (as well as regions). It is linked to increased welfare, the creation of new types of jobs and the destruction of old ones. (OECD, 2009, p. 4)

Smith (2006) sets out three reasons why innovation improves economic and social outcomes.

- Innovation improves products and processes, which increases productivity and output.
- Innovation shapes technical changes and so affects real incomes and economic welfare.
- Innovation is central to countries' efforts to establish and maintain competitive advantage in international commerce.

Competition policy can foster productivity growth by removing unnecessary impediments to innovation.

What role does collaboration play in the innovation process?

The costs of engaging in innovation can be large and the outcomes uncertain (Smith, 2006), which can make it difficult to raise investment funding (Hajimanolis, 2006). Also, many firms focus on short-term returns, which crowds out innovation projects that have long lead times before generating revenue (Loewe & Dominiquini, 2006).

Collaboration – which refers broadly to an agreement between two or more parties to share the commitment to reach a common goal by pooling resources and coordinating activities (Caloghirou, Ioannides & Vonortas, 2003) – can help firms to overcome these barriers.

Faems, van Looy and Debackere (2005) set out three main reasons why collaboration between organisations can increase the effectiveness and efficiency of the innovation process. Collaboration:

- allows access to complementary assets needed to commercialise innovation projects;
- encourages the transfer of codified and tacit knowledge, leading to the creation and development of resources that would otherwise be difficult to develop or mobilise; and
- enables firms to share R&D while spreading the costs and risks of innovation projects.

Collaboration is not always successful and may fail when, for example, business partners have different views about R&D projects or the intended benefits of working together, or are inflexible or unable to adapt. Yet overall, the evidence indicates that collaboration improves innovation (Faems, van Looy & Debackere, 2005). Collaboration between firms has grown in popularity since the early 1980s, with a wide variety of different agreements emerging. In particular, cooperation that focuses on generating, exchanging or adapting new technologies has grown in popularity (Caloghirou, Ioannides & Vonortas, 2003).

Increasingly, businesses are collaborating internationally. In the car-making industry, for example, the world's 24 largest carmakers all operate some form of alliance or joint venture with another large carmaker and share research, vehicle designs, engines, or other components. For example, Nissan has established joint ventures with Dong Feng, Renault and Daimler, alongside:

- contract assembly alliances with Mitsubishi, Suzuki and Daimler;
- parts and technical alliances with Mitsubishi and Daimler; and
- cross-shareholding relationships – Nissan owns 15% of Renault and 2% of Daimler (Foy, 2013).

Statistics New Zealand's 2013 Business Operations Survey (2013b) provides some insight into how New Zealand businesses collaborate and innovate. 46% of surveyed businesses reported undertaking some form of innovation and 11% of businesses undertook innovation using a cooperative arrangement. The survey results suggest that scale is an important enabler of innovation. The proportion of innovating firms increased with business size – from 43% (for businesses with 6–19 employees) to 64% (for businesses with 100 or more employees).⁵⁸ This indicates that collaboration – to the extent that it enables smaller businesses to capture some of the benefits of larger size – may foster innovation.

⁵⁸ Nearly three-quarters of the survey sample were businesses with 6–19 employees.

The relationship between competition and collaboration

During the inquiry, the Commission heard that some businesses are reluctant to enter into collaborative agreements for fear of breaching the Commerce Act. This concern is more apparent among smaller firms – presumably because they lack the legal expertise to confidently navigate competition law. One inquiry participant noted that the Commerce Commission “casts a long shadow” on collaborative business arrangements.

Part 2 of the Commerce Act

To promote competition in markets, Part 2 of the Commerce Act contains provisions that prohibit the following types of collective behaviour (behaviour by two or more businesses):⁵⁹

- agreements that contain provisions that substantially lessen competition in the market;
- agreements that exclude competitors by containing provisions that prevent or limit dealings with a rival; and
- agreements that contain provisions to fix prices among competitors.

These provisions do not prohibit collaboration, but may discourage it. The Commerce Act also contains three “partial exemptions” to the price-fixing rules, which are partial in the sense that the Commerce Commission (or any other party) may still challenge an agreement if it believes it will substantially reduce competition. The partial exemptions relate to: recommended prices where there are 50 or more parties to an agreement for a recommended price; joint buying or advertising arrangements; and joint ventures.

Recommended price arrangements are permitted so long as there are 50 or more parties to the agreement and they are genuine recommendations that parties can decide not to follow. More relevant for firms seeking to collaborate are the partial exemptions relating to joint ventures and joint buying or advertising arrangements. Joint ventures typically involve two or more firms pooling resources and supplying goods or services as if they were a single entity. Firms are also able to enter into joint buying or advertising arrangements. For example, firms may collectively purchase goods at a discounted bulk price.

The Commerce (Cartels and Other Matters) Amendment Bill

The Commerce (Cartels and Other Matters) Amendment Bill (the Commerce Amendment Bill) proposes significant changes to the Commerce Act that are likely to affect the balance between competition and collaboration. Box 7.5 sets out its main features.

Box 7.5 Features of the Commerce (Cartels and Other Matters) Amendment Bill

The penalty regime – The Bill introduces criminal sanctions for individuals and companies engaging in hard-core cartel conduct. For an individual, the maximum sanction would be seven years in prison – a significant increase from the penalties that currently apply.

The prohibition – The Bill defines hard-core cartel conduct as price fixing, restricting output, and allocating markets.

The exemptions – The Bill includes a “collaborative activity” exemption, which is intended to apply to all pro-competitive arrangements, not just joint ventures. It also contains exemptions for joint buying and promotion agreements, and for vertical supply contracts.

The clearance regime – The Bill introduces a clearance regime to help businesses manage any residual risk that their proposed collaborative activity might breach the Commerce Act. The clearance regime aims to provide greater certainty for businesses by testing with the Commerce Commission whether

⁵⁹ Part 2 of the Commerce Act also includes provisions relating to unilateral behaviour (behaviour by a single business). These provisions are discussed earlier in this chapter.

planned collaborative arrangements come within the exemption.

Criminalisation of cartel conduct aligns New Zealand's penalty regime with Australia as part of the Single Economic Market agenda. It also aims to facilitate the Commerce Commission cooperating with overseas regulators to enhance the identification of and enforcement against global cartels.

Source: Commerce Commission, 2013a; Power, 2011.

The law firm Russell McVeagh has noted that the Commerce (Cartels and Other Matters) Amendment Bill is "languishing" in Parliament more than two years after its introduction, and resolving the Bill's status would have significant productivity benefits:

We consider that resolving the applicable regulatory framework for pro-competitive collaboration, in circumstances where draft legislation has already been reported on at Select Committee, would be a significant "win" for productivity in the services sector, and other sectors. Having legislation languish in the House... is, in this context, plainly a negative outcome for productivity. (Russell McVeagh, sub. 208, p. 5)

The Commission is not aware of any policy rationale for this delay. Regulatory uncertainty creates costs for businesses and should be avoided as much as possible. Government should use its influence to expedite the Commerce (Cartels and Other Matters) Amendment Bill, or, at minimum, provide businesses with more guidance on the Bill's timetable.

Is an appropriate balance being struck?

Several submitters to the Commerce Select Committee (such as Air New Zealand, Buddle Findlay and BusinessNZ) argued that the Commerce Amendment Bill will have a detrimental effect on commerce in New Zealand. Russell McVeagh (2012) noted "that the claimed deterrent effect of criminalisation does not outweigh or compensate for the chilling effect it will have on pro-competitive behaviour and the increased costs of doing business in New Zealand."

These concerns were considered in the Commerce Amendment Bill's regulatory impact statement (RIS). To mitigate unintended consequences, the RIS proposed clarifying the prohibition and exemptions, and introducing a clearance regime (MED, 2012). The RIS noted that sequencing the criminal regime's introduction (the regime does not come into effect until two years after the Commerce Amendment Act comes into force) will reduce uncertainty about how the Commerce Commission will interpret key terms. The RIS also stated that "activities such as advocacy and developing prosecution guidelines can also help to improve certainty and minimise costs" (MED, 2012, p. 21).

It is difficult to predict how the Commerce Amendment Bill might affect competition and collaboration in the services sector. The proposed regime includes new provisions aimed to help ensure an appropriate balance is struck, including the clearance regime to enable firms to test the legality of collaborative arrangements. Businesses can also have pre-clearance discussions with the Commerce Commission which can help to make the clearance process quicker and more efficient (Commerce Commission, 2013a).

Despite these provisions, perceptions remain that criminalising certain activities will have a dampening effect on pro-competitive business activities. BusinessNZ notes that the way the Act has been drafted will "most likely ... have a chilling effect on legitimate business risk-taking" (sub. 203, p. 3).

If the Bill is enacted, measures such as publicity campaigns to explain the changes and their implications should be used to limit any unintended consequences.

The Commerce Commission has already published draft Competitor Collaboration Guidelines, which were presented for feedback at events in Auckland, Wellington and Christchurch. It also conducts business surveys to monitor awareness of competition policy and conducts targeted awareness campaigns in specific markets, including among smaller businesses.

Even so, the outreach capabilities of the Commerce Commission are limited and, ultimately, the responsibility for adhering to the law sits with business. As noted earlier, any constraining effect of competition law on pro-competitive collaboration is likely to be most acute among smaller businesses. Industry associations may be able to help disseminate information about the Commerce Amendment Bill to their members, including information about the steps required to gain Commerce Commission clearance for collaborative arrangements.

F7.2

It is important that the Commerce (Cartels and Other Matters) Amendment Bill is well understood by business. Industry associations may be able to help disseminate information about the Bill to their members, including information about the steps required to gain Commerce Commission clearance for collaborative arrangements.

It is also important that there is effective monitoring and evaluation to assess the effects of the Commerce Amendment Bill. BusinessNZ (sub. 203) notes the importance of reviewing amendments regarding criminalisation of hard-core cartel behaviour to establish whether the amendments have been successful. Bell Gully (sub. 210, pp. 1–2) expressed a similar view:

We agree ... that it is difficult to ascertain now what effect the [Commerce Amendment Bill] ... will have on competition and collaboration in the services sector. Clearly, any rule which has the effect of restricting competition or innovation in New Zealand's small markets is undesirable. In our view, the proper course may be to revisit this issue once the effect of the Bill ... is known.

The Bill's RIS (MED, 2012, p. 27) includes a short section on monitoring, evaluation and review:

The [Commerce] Commission captures data on cartel investigations, leniency applications, cases filed and other relevant variables through quarterly reporting. On-going monitoring can be undertaken through the normal monitoring processes in place for monitoring the overall performance of the Commission ... Once all stages of the proposal are implemented, a qualitative assessment of the effectiveness of the regime would be undertaken as part of MED's monitoring function.

The Productivity Commission's draft report on *Regulatory institutions and practices* (NZPC, 2014b) sets out some principles for effective evaluation of regulations and regulatory regimes. One principle is that evaluations should be appropriately prioritised depending on:

- the regulation's width of reach (number of entities and/or value of activity affected);
- the regulation's depth of reach (the extent to which entities are affected);
- information that the issue is critical for stakeholders; and
- any other information that a regulation is imposing large costs.

The Commerce Amendment Bill has a wide reach, has potential to affect important firm decisions such as whether to undertake collaboration and innovation, and has elicited concerns that it will raise the costs of doing business in New Zealand. Accordingly, the Productivity Commission supports a thorough review of the Commerce Amendment Bill, which includes consideration of its impacts on the costs of doing business and undertaking innovation, and how well the changes are understood by business. The review should be conducted around two to four years after the changes come into effect.

In order for the evaluation to be effective, there needs to be a base from which to measure change. Accordingly, data collection needs to begin prior to the policy's implementation, not when the evaluation takes place two years later (NZPC, 2014b). Statistics New Zealand's surveys of business innovation (as part of the Business Operations Survey) may be a useful data source to help measure any effects on firms' collaboration and innovation.

R7.4

The Commerce (Cartels and Other Matters) Amendment Bill should be evaluated between two to four years after it comes into effect. The evaluation should consider impacts on the costs of doing business and undertaking innovation, and the extent to which the implications of the Bill are understood by a range of different types of business.

7.4 Is there a case for market studies?

What are market studies?

Competition authorities in many countries can undertake broad-ranging inquiries – commonly known as market studies – into the state of competition in particular markets. There is no single definition of a market study, and it involves a variety of different practices and approaches. The International Competition Network sets out the more common features of market studies.

Market studies are research projects conducted to gain an in-depth understanding of how sectors, markets, or market practices are working.

They are conducted primarily in relation to concerns about the function of markets arising from one or more of the following: (i) firm behaviour; (ii) market structure; (iii) information failure; (iv) consumer conduct; (v) public sector intervention in markets (whether by way of policy or regulation, or direct participation in the supply or demand side of markets); and (vi) other factors which may give rise to consumer detriment.

The output of a market study is a report containing findings based on the research. This may find that the market is working satisfactorily or set out the problems found. Where problems are found the market study report can include: (i) recommendations for action by others ... and/or (ii) commitments by the competition (or competition and consumer) authority itself to take advocacy and/or enforcement action. (ICN Advocacy Working Group, 2010, pp. 4–5)

The primary purposes for conducting market studies include:

- as a lead-in to litigation when anti-competitive behaviour is suspected but competition authorities do not exactly know the nature and source of the competition problem;
- as a foundation for competition advocacy;
- to build technical expertise about markets (particularly useful for markets that are new or fast-moving, or to take account of recent developments);
- to address public interest or concern about markets; for example, to test allegations of anti-competitive conduct or agreements;
- to reduce uncertainties about how the authority will apply competition principles – again this may be particularly useful in new or fast-moving markets, or those where there have been recent changes; and
- to develop thinking about proposals for future regulation so as to advocate to minimise adverse effects on competition (OECD, 2008b; ICN Advocacy Working Group, 2009).

Market studies in other countries

Box 7.6 sets out the approaches to market studies in the United Kingdom, Ireland, Australia and Japan. The approach in the United Kingdom is relatively comprehensive and resource-intensive, while the Japanese approach sits at the other end of the spectrum, being relatively light-handed.

Box 7.6 Market studies in the United Kingdom, Ireland, Australia and Japan

United Kingdom – The United Kingdom takes a two-pronged approach to market studies, with the Office of Fair Trading (OFT) and the Competition Commission (CC) dedicating significant resources to them.⁶⁰ The OFT uses market studies to examine how a market is working, with a view to addressing any competition issues, consumer detriment, or issues stemming from government regulations. OFT selects the topics, but takes account of suggestions from stakeholders, including government departments. The Department for Business, Innovation & Skills is responsible for coordinating a government response when regulatory recommendations are made.

Outcomes of a market study include: a finding that nothing is wrong with the market; consumer-focused action; recommendations to business or the Government; investigation and enforcement action; or referral to the CC for a more detailed market investigation.

In conducting a market investigation, the CC examines whether features of a market prevent, restrict or distort competition. After identifying a competition problem and its causes, the CC can impose legally enforceable remedies or recommend that other public organisations take remedial action. The CC does not choose topics for market investigations – they are referred to the CC by the OFT, sector regulators or Ministers (although Ministers have not used this power to date). The CC has the power to compel others to provide information and data, and the UK Government has committed to responding to any recommendation made to it within 90 days after the CC's final report is published.

Ireland – The Advocacy Division of the Irish Competition Authority has undertaken market studies since 1997. Completed studies include solicitors and barristers, ports, and mobile telecommunications. Their main purpose is to evaluate competition in specific markets, with a view to advocating that the Government removes any unnecessary distortions of competition. Studies may also lead to enforcement action where potential breaches of competition law are identified.

The Competition Authority has the power to compel the provision of information for market studies but uses the power rarely, as participants generally provide information willingly. Topic selection is usually at the discretion of the Competition Authority. Since 2008 the Irish Government has published whole-of-government responses to the recommendations in market studies.

Australia – Under Part VIIA of the Competition and Consumer Act, the Australian Competition and Consumer Commission (ACCC) may “hold an inquiry into a specified matter or specified matters”.

The Australian Minister for Competition Policy and Consumer Affairs must request or approve any inquiry. The Minister may also request that the ACCC monitor prices, costs and profits relating to the supply of goods or services by an industry or specific business. The ACCC must make both inquiry and monitoring reports publicly available after it has delivered them to the Minister.

Japan – The Japan Fair Trade Commission (JFTC) undertakes “fact-finding surveys”, which are a less complex form of market study. Fact-finding surveys are used to gain insight into specific markets, industries, and trade practices when competitive environments notably change and where unreasonable trade practices are apparent.

The JFTC can compel the provision of information, but generally relies on voluntary cooperation from survey participants. Survey results are mainly used for advocacy purposes. If the results raise concerns about competition, the JFTC will point out the concern, encourage the parties to voluntarily improve compliance, and publish the survey findings.

Source: Competition Commission, 2013b; OECD, 2008b; OFT, 2010a.

⁶⁰ The Competition Commission and the competition and certain consumer functions of the Office of Fair Trading were merged together to form the Competition and Markets Authority (CMA). The change came into effect on 1 April 2014. The two agencies' approaches to market studies have been retained, but are now both performed by the CMA.

F7.3

Competition authorities in many other countries use market studies. While they have common elements, practices vary significantly between jurisdictions.

Approaches to studying competition in New Zealand

The following section sets out the existing approaches to studying competition in New Zealand across different agencies. These can be grouped in the following categories:

- Commerce Commission studies;
- studies by other government agencies, including MBIE and the Productivity Commission; and
- studies undertaken by non-government organisations (NGOs).

Commerce Commission studies

The Commerce Commission has several ways it can undertake and publish studies into the state of competition in New Zealand markets.

General provisions

Previously, experts have debated whether the Commerce Act authorises the Commerce Commission to undertake market studies as it chooses. In 1991/92 the Commerce Commission, purporting to act under the Commerce Act, conducted an inquiry into the development of competition in the telecommunications industry in New Zealand and the extent to which the regulatory framework was assisting this. In December 1991 Telecom began a judicial review proceeding against the Commerce Commission, challenging the basis of the inquiry. The court found that the Commerce Commission had acted outside its powers (*Commerce Commission v Telecom Corporation of New Zealand Ltd*, 1994).

The Productivity Commission understands that, as a result of this ruling, the Commerce Commission has taken a conservative approach to any studies not specifically provided for in the Commerce Act.

The Commerce Commission will proactively publish investigation reports where it considers them to be of general interest to the public or in response to requests under the Official Information Act. These reports summarise the results of investigations that the Commerce Commission has already undertaken in enforcing the Commerce Act. They provide explanations of how and why the Commerce Commission reached its conclusions and do not include recommendations.

At the time of writing, four such reports were available on its website. One example is the investigation report on Sky TV contracts which contains the Commerce Commission's assessment of whether provisions of Sky TV contracts with content providers and telecommunications retail services providers breach s 27 or s 36 of the Commerce Act (Commerce Commission, 2013b).

The Commerce Commission also has a Clearances Register on their website which contains a full list of all applications for merger clearance, along with written reasons for the Commerce Commission's decisions. These often provide a general overview of the Commerce Commission's views on competition within the markets affected by the mergers.

Commerce Commission inquiries under specific circumstances

The Commerce Act makes two specific references to market inquiries. Sections 52H to 52K allow *Commission inquiries*, but these are limited to the formal questions of whether and how goods and service markets should be regulated under Part 4 of the Act. One example is the 2003 gas pipeline inquiry (Commerce Commission, 2003).

S 9A (1) (b) of the Telecommunications Act 2001, as amended in December 2006, gives the Commerce Commission the power to proactively conduct inquiries, reviews and studies into any matter relating to the telecommunications industry or the long-term benefits of end-users of telecommunications services within

New Zealand. This power enables the Commerce Commission to conduct market studies – but only on matters that relate to telecommunications.

Two studies completed under s 9A of the Telecommunications Act were published on the Commerce Commission's website (as at April 2014):

- *High-speed broadband services demand side study* – this study sought to raise awareness of issues that might affect the uptake of high-speed broadband in New Zealand (Commerce Commission, 2012c) and
- *Consumer switching survey* – a survey that examined the extent and nature of consumer switches between telecommunications providers (Commerce Commission, 2012b).

In their report on broadband services, the Commerce Commission (2012c, p. 5) noted that inquiries conducted under s 9A do not include policy decisions or regulatory recommendations:

In submissions received on the draft report, some parties commented that the Commission was not explicit about what actions should be taken by which external parties, or that the Commission did not make specific recommendations. Policy decisions and regulatory recommendations fall outside the Commission's jurisdiction under section 9A of the Telecommunications Act.

Advocacy reports

In the past, the Commerce Commission's approach to its responsibilities has focused on investigating and litigating potential breaches of the Commerce Act. More recently, the Commission has taken a complementary approach of encouraging greater awareness of the benefits of competition and education to avoid illegal behaviour (Commerce Commission, 2010). It has also established a Screening and Intelligence Unit, which aims proactively to identify anti-competitive practices.

In the process of gathering information to inform advocacy campaigns, the Commission has previously undertaken and published research into competition and practices in specific markets (eg, see Commerce Commission, 2011).

Studies by other agencies

Alongside the work of the Commerce Commission, there are at least three other avenues for government agencies to conduct studies into the state of competition in New Zealand markets.

Ministry of Business, Innovation and Employment

MBIE provides policy advice on the Commerce Act and applies competition policy to specific sectors. MBIE occasionally undertakes market studies, although it has no formal requirement to do so.

MBIE is (at the time of writing) conducting a market study into the residential construction sector. The study aims to identify barriers to improved housing affordability, with particular reference to the competitiveness and productivity of the sector. The study examines competition issues, including the use of targeted discounts for building materials and strategic practices such as cover pricing (MBIE, 2013b).

Ministerial inquiries

Ministerial inquiries are another option for examining competition issues. These inquiries are conducted on a one-off basis, and occasionally examine competition issues in specific markets (Box 7.7).

Box 7.7 Ministerial inquiries

With agreement from Cabinet, Ministers can establish inquiries into areas for which they are responsible. The inquiries are usually convened to look into matters of policy that are controversial or of strong public interest (DIA, 2001). The Inquiries Act 2013 (s 20 and s 23) provides powers for Ministerial inquiries to compel evidence and summon witnesses.

One example is the Ministerial Inquiry into the Electricity Industry, completed in 2000, which examined whether the regulatory arrangements for the electricity sector were best suited to ensuring that electricity was delivered in an efficient, reliable, and environmentally sustainable manner (OAG, 2005).

The terms of reference specified that the inquiry should make particular comment on whether there are barriers to entry by new retailers that restrict the development of competition (Hodgson, 2000).

Productivity Commission inquiries

Productivity Commission inquiries can also touch on competition issues in specific markets. For example, the inquiry into international freight transport services contained several recommendations geared toward improving competition in the freight and transport industries (NZPC, 2012a). However, to date, Productivity Commission inquiries have examined broad topics – none have focused exclusively on competition issues within a certain market. The Productivity Commission also conducts empirical research into the state of competition in New Zealand markets.

Studies by NGOs

Several organisations work to improve the welfare of New Zealand consumers. Examples include the Home Owners & Buyers Association, the Telecommunications Users Association of New Zealand, the Domestic Energy Users' Network, and Consumer NZ.

Some of these organisations conduct research that provides insights into competition in specific markets from a consumer perspective. For example, Consumer NZ has undertaken "mystery shopper" exercises to monitor how markets perform from a consumer perspective (Box 7.8). Such studies are potentially a rich source of information on how markets are performing, particularly where consumer outcomes are poor.

Box 7.8 Consumer NZ's investigation of financial advisers

In 2009 Consumer NZ conducted a mystery shopping exercise with the aim of producing a snapshot of the quality of advice that financial advisers give to consumers. The project was completed with financial support from the Retirement Commission (now the Commission for Financial Literacy and Retirement Income, CFLRI) and the Ministry of Economic Development, and in-kind support from the Securities Commission (now the Financial Markets Authority).

Consumer NZ collected 17 investment plans from different financial advisers after mystery shoppers had approached them for advice based on their own circumstances. A panel of experts reviewed the plans and classified them as either "good", "disappointing" or "rejected" (rejected plans contained little relevant analysis and advice, lacked essential information, or contained advice not in the shopper's best interests).

Only three plans were rated as "good", six were rated as "disappointing" and the remaining eight were "rejected". Common problems with the plans included:

- a lack of a meaningful rationale for what was being advised – some advisers recommended that shoppers invest with one particular provider group, but gave no reason for selecting that provider;
- some advice was deemed not to be in the consumer's interests – one adviser recommended investing heavily in managed funds when the shopper was likely to have a sizable mortgage; and
- many investment plans failed to include clear information about costs – it was impossible to work out the initial and ongoing costs of their recommended strategies.

Source: Consumer NZ, 2009.

F7.4

Several New Zealand agencies conduct research into competition in New Zealand markets, including the Commerce Commission, MBIE, the Productivity Commission and non-government consumer groups.

Is there a case for formal market studies in New Zealand?

In the 2nd interim report, the Commission asked whether there is a case for some additional form of study or investigation into the state of competition in New Zealand markets. Reflecting the range of options already available, the Commission asked which of the following options would be most beneficial:

1. Granting the Commerce Commission a formal mandate to conduct market studies.
2. More regular use of inquiries that are currently undertaken on an ad hoc basis.
3. Providing more resources to the competition advocacy work of the Commerce Commission.
4. Establishing a small contestable fund available to organisations that research the performance of specific markets, with an emphasis on improving market outcomes for consumers. (NZPC, 2014a, p. 87)

Participants' views

Options 1 and 2 attracted the most comments from inquiry participants, with just two submitters commenting on options 3 and 4. The Commission considered options 3 and 4 further and decided not to make any recommendation relating to them (Box 7.9). Accordingly, the rest of this section focuses on market studies.

Box 7.9 Options that should not proceed at this time

Consumer NZ supported option 4, noting that such a fund might have enabled them to follow up on their 2009 mystery shop of financial advisers:

[The mystery shop] was done to benchmark their activities before new regulations were introduced. The outcome of that research was widely reported and resulted in changes to the code for financial advisors. It had been intended to revisit that work within two years of its completion to see if there had been any improvement... However, that work has not been done, simply because the funding has not been able to be found. (Consumer NZ, sub. 221, p. 4)

Donal Curtin (sub. 201) suggested that providing more resources to the competition advocacy work of the Commerce Commission (option 3) has merit in its own right, irrespective of the market studies issue. The same submitter was less convinced about the idea to establish a contestable fund available to organisations that research competition and consumer outcomes in specific markets (option 4):

Option 4 looks like an unnecessarily complex arrangement (and given the small amount of funding likely to be at stake, likely to be administratively expensive to allocate). (Donal Curtin, sub. 201, p. 4)

The Commission agrees that the administrative costs associated with option 4 are likely to be high relative to the size of the fund and has therefore not pursued this option. Likewise, in the absence of strong support for upgrading the Commerce Commission advocacy role, it appears that sufficient resources are being dedicated to this role

Most submissions focused on whether to introduce market studies, and on where that function might best be located. Views were split between supporters and opponents of introducing market studies (Box 7.10).

Box 7.10 Some participant views on market studies

Several inquiry participants strongly supported the introduction of market studies:

... market studies are now conducted by a large, and growing, number of developed economies. ... it is remarkable that New Zealand, which has a long history of early adoption of progressive social and economic ideas under governments of all persuasions, has not yet reached for a tool designed to improve the operation of markets, for the benefit of consumers (including businesses who are customers of other businesses). (Donal Curtin, sub. 201, p. 1)

2degrees supports the Commerce Commission, as the independent competition regulator, being

provided powers to undertake market studies as to the state of competition in different markets. 2degrees considers similar powers under section 9A of the Telecommunications Act to conduct inquiries in relation to telecommunications markets to be a useful addition to the regulatory toolkit. (2degrees, sub. 217, p. 3)

Consumer NZ would support increased funding to the Commerce Commission to enable it to conduct market studies or to commission other organisations to undertake those studies... The ability of the Commission to undertake independent investigations, without necessarily having to act on a complaint, would enhance its knowledge of business practices generally and of the market place. (Consumer NZ, sub. 221, p. 3)

IAG also supported market studies, but somewhat more cautiously:

The Commission's idea of developing a mechanism to assess the application of competition to particular markets is a useful one. It recognises and responds to the fact that competition is a complex phenomenon that varies from sector to sector, and from market to market. If workable, this type of mechanism could promote more informed and robust discussion of the effectiveness of competition in particular markets. (IAG, sub. 204, p. 7)

Both Russell McVeagh (sub. 208) and ANZ (sub. 216) raised concerns that market studies would significantly increase compliance costs of businesses that were the subject of such studies. Both submissions also suggested that further analysis and wider consultation be undertaken before making any recommendation to introduce market studies.

Bell Gully's submission argued against introducing market studies:

We are not persuaded that it is necessary for New Zealand to make greater use of market studies ... such exercises are likely to be very costly for Government and for business and do not produce outcomes that could not be realised through traditional policy development mechanisms. (Bell Gully, sub. 210, p. 2)

The Productivity Commission's view

One shortfall of the current approach to market studies in New Zealand is that the Commerce Commission may only conduct market studies regarding the telecommunications industry. The Productivity Commission considers that there would be value in granting the Commerce Commission powers to conduct market studies regarding competition in any market in the economy. This would require a provision to be added to the Commerce Act similar to s 9A (1) (b) of the Telecommunications Act.

The following section discusses some of the costs and benefits associated with granting the Commerce Commission powers to conduct market studies in any specific market.

Benefits and costs of a broader power to conduct market studies

An additional tool in the Commerce Commission toolkit

Market studies undertaken in other countries often focus on identifying market failures in a specific market. Studies attempt to reach a thorough understanding of the market conditions and dynamics and the resultant obstacles to competition, in order to recommend appropriate remedies (Indig and Gal, 2013). In some instances the obstacles to competition may stem from breaches of competition law. However, there are also likely to be situations where obstacles stem from other regulatory issues, or issues such as low demand-side competition.

One shortcoming of the current range of tools at the Commerce Commission's disposal is that (outside of the telecommunications industry) the Commission has no clear path to follow when it identifies competition problems that fall outside its role of enforcing the Commerce Act. Market studies, along the lines undertaken in other countries, would provide such a path to enable the Commerce Commission to investigate barriers to competition that cannot be resolved through enforcement actions.

This raises the question of how much involvement the Commerce Commission, whose responsibility is primarily the enforcement of the Commerce Act, should have in policy advice. The Productivity

Commission's draft report on *Regulatory institutions and practices* notes that regulator involvement in strategic policy advice is important for effective regulatory outcomes. This enables policy to be grounded in the practicalities of the daily work of government.

Regulators need to focus on not just the compliance behaviour of regulated parties but also on ... the dynamics of the environment in which regulated parties operate. (NZPC, 2014b, p. 264)

Market studies are a tool that would usefully enable the Commerce Commission to build a deeper understanding of the dynamics of specific markets and to feed into the policy process.

Improve knowledge of competition dynamics

One advantage of market studies is that they can be a useful and effective tool in developing market knowledge. This is particularly useful for markets that are new or fast-moving, or where there are new innovations or developments (ICN Advocacy Working Group, 2009; Indig & Gal, 2013).

LAG (sub. 204, p. 7) noted the potential value of market studies in helping to build a more detailed understanding of markets:

...developing a mechanism to assess the application of competition to particular markets is a useful one. It recognises and responds to the fact that competition is a complex phenomenon that varies from sector to sector, and from market to market. If workable, this type of mechanism could promote more informed and robust discussion of the effectiveness of competition in particular markets.

Market studies can also perform a useful educative or "myth-busting" role. Indig and Gal (2013, p. 9) note that market studies can

... help **refute mistaken public assumptions** that anticompetitive behavior takes place, most notably in cases of price increases. Thus, [market studies]... can prevent mistaken and costly regulatory interventions or public outcries. The UK Agency's power to give an industry a "clear bill of health" serves this end. [Emphasis in original]

In such circumstances, studies can help to avert costly government intervention where markets are working efficiently (OECD, 2008b). Of course, for market studies to achieve this benefit it is important that they do not become cumbersome and overly costly. Two submissions (Russell McVeagh, sub. 208; ANZ, sub. 216) considered that recent inquiries in Australia (into petrol and grocery prices) were a costly and time-consuming way of establishing that there were no major concerns in the markets:

...prominent recent inquiries in Australia resulted in little material change for consumers. The ACCC's inquiry into petrol prices in 2007, for example, ultimately concluded that price changes were the result of international movements and that even if the recommendations of the report were implemented that there would be only marginal changes in pricing... Similarly, the 2008 inquiry into the supermarket industry concluded that the market was workably competitive and that there was nothing demonstrably wrong with the grocery supply chain. (Russell McVeagh, sub. 208, p. 6)

Better international linkages

The limits on the Commerce Commission's ability to undertake market studies appear to make New Zealand something of an outlier. Competition authorities in many developed countries already conduct market studies and in recent years they have been added to the powers of competition authorities in several countries. For example, since 2004 competition regulators in Spain, Poland and Norway have all been granted these powers (OECD, 2008b).

As Donal Curtin notes (sub. 201, p. 1), "widespread adoption of a policy or practice is no guarantee of its worth". However, in not having a power to conduct market studies, the Commerce Commission may be missing opportunities to learn from overseas experience.

Competition authorities in other countries report benefits

Competition authorities in other countries consider that market studies are useful for collecting information and developing thinking that informs their enforcement work (ICN Advocacy Working Group, 2009). Yet agencies also note that quantifying the costs and benefits of market studies work can be difficult. Indeed, the Productivity Commission is unaware of any research that attempts to quantify the overall benefits and costs from having a competition authority that is empowered to conduct market studies.

The United Kingdom's OFT conducts evaluations of their market studies. Box 7.11 summarises three recent evaluations. Each points towards significant benefits accruing as a result of changes implemented in response to the market study.

Box 7.11 Recent evaluations of OFT market studies

Market study into doorstep selling in the United Kingdom – The impact of changes resulting from the OFT's market study into doorstep selling were evaluated in 2012. The results included:

- sales growth of £57 million a year as measured by the value of extra purchases that consumers made that they would not otherwise have made without changes in consumer protection regulations as a result of the OFT's market study;
- £8.5 million a year in reduced/avoided "consumer detriment", as measured by the value of the purchases that consumers cancelled that they would not otherwise have cancelled without changes in consumer protection arrangements as a result of the OFT's market study.

Market study into care homes – This market study identified a range of concerns and concluded that many users were poorly served by the market. The OFT recommended improving how the market operated, including changes to the information that local authorities provided to prospective and existing care home residents, and changes to care home regulators and care homes.

A 2011 evaluation found that study's recommendations led to changes in the care homes market, resulting in the improved welfare of care home residents. The evaluation estimated that "the overall benefit to cost ratio ... associated with the OFT's market study seems unquestionably to be well in excess of the 5:1 target that is part of the current OFT's Spending Review Commitments" (OFT, 2011). The evaluation also identified scope for improving how information is provided and improving access to redress in the care home market.

Control of entry regulations in the retail pharmacies market – The OFT's 2003 market study recommended that the control of entry regulations for community pharmacies be abolished. The Government implemented changes as a result of the study, but these were considerably more modest than the changes recommended in the study.

A 2010 evaluation estimated that the reforms had increased entry rates and competition in the pharmacies market, increasing consumer choice and access, and stimulating investments and improvements in service that would not otherwise have occurred. The reforms delivered quantifiable yearly benefits to consumers of £24.7m to £32.8m, compared with £12.5m of additional costs to businesses and the National Health Service. The evaluation also identified numerous extra non-quantifiable benefits, such as increased availability and extended opening hours.

Source: OFT, 2010b; 2011; 2012.

Compliance costs for business

Alongside the cost of resources dedicated toward undertaking market studies (discussed in the next section), market studies will often result in compliance costs for businesses that operate in affected markets. Little evidence is available about the magnitude of these costs. The Business and Advisory Committee to the OECD notes that preparing proper responses to market studies can involve significant financial costs and time costs for businesses: "A company's external costs in a typical ... Competition Commission investigation can be over £4m and internal costs over £2.5m" (OECD, 2008b, p. 202).

The approach to market studies undertaken by the Competition Commission in the United Kingdom is at the “intensive” end of the spectrum⁶¹. Reflecting this, the compliance costs quoted by the Business and Advisory Committee to the OECD are likely to be higher than those incurred in other countries.

While compliance costs for businesses cannot be eliminated, they should be factored into the overall ex-ante assessment of the merits of undertaking a market study. Indig and Gal (2013) note that compliance costs should be evaluated against the likely outcomes of the market study. They note also that competition authorities should explore alternative options for the collection of information to inform market studies, so as to reduce costs for business.

Two inquiry participants (Russell McVeagh, sub. 208; ANZ, sub. 216) suggested that the Commerce Commission’s investigation into the electricity sector (see Commerce Commission, 2009a) was analogous to a market study. Both submissions noted that this investigation was protracted and very costly for both the Commerce Commission and affected businesses. The submissions note that the investigation found no evidence of breaches of the Act, but issued one warning regarding a risk of a breach.

However, this was an investigation to determine “whether parties in the electricity industry may have breached the Commerce Act by taking advantage of a substantial degree of market power for an anti-competitive purpose, or by entering into arrangements that had the purpose or effect of substantially lessening competition” (Commerce Commission, 2009a). In other words, it was part of the Commerce Commission’s enforcement role.

Market studies may conflict with the Commerce Commission’s enforcement role

Bell Gully (sub. 210, p. 2) raised the concern that granting the Commerce Commission wider powers to conduct market studies could potentially conflict with their primary role of enforcing the Commerce Act:

If it is thought that such market studies should be used more frequently, we consider that they should be conducted as required by MBIE rather than the Commerce Commission. To impose a further research function upon the Commission could distract it from its other roles, and would present obvious difficulties with reference to its separate enforcement roles...

The Commerce Commission would need to be mindful of the potential for findings from a market study to conflict with future enforcement work. Approaches used in other jurisdictions may be instructive in this regard. For example, in Italy and the United States, when a market study reveals an infringement, the competition agency must open a separate investigation into the issue (Indig and Gal, 2013).

There is also some risk that the introduction of market studies will result in fewer resources being dedicated to traditional enforcement tasks, leading to inferior performance. However, Indig and Gal (2013) raise three counter-arguments (Box 7.12).

Box 7.12 The interplay between market studies and enforcement tasks

Indig and Gal (2013) suggest three reasons why introducing market studies or market inquiries (MIs) will not necessarily dilute resources to the other roles of a competition authority:

First, MIs’ broad prism, which does not focus on a specific firm but rather on a sector, a type of agreement, consumer conduct patterns, regulatory frameworks etc., has a higher probability to reach the genuine roots of market or regulatory failures, and allows for more holistic remedial suggestions. Furthermore, MIs can also tailor solutions to market failures that are not dealt with effectively by competition laws. Most importantly, they may deal with the Achilles’ heel of competition law: oligopolistic coordination in highly concentrated markets. Accordingly, the goal of furthering competition may in some cases be better achieved through MIs.

Second, the new powers create synergies between regulatory tasks. Economic insights derived

⁶¹ Indig and Gal (2013, p. 5) note that the United Kingdom has adopted a “Supervisory Model” where the Competition Commission is empowered to take pro-active steps to remedy at least some types of market failures, “much like a direct regulator, intervening and changing market conditions in order to further competition.”

thorough MIs may be applicable to the Authority's other activities. They provide a solid and thorough knowledge base to draw upon in traditional investigations in the studied markets, thereby reducing asymmetric information problems. Furthermore, general insights and lessons from an MI can carry over to traditional inquiries, as well as improve its advocacy activities by incorporating a wider set of examples that correspond with recognized public concerns and perceptions. Thus, even if diluting the resources vested in each task, MIs may still enrich the Authority's expertise and compensate for dividing the resource pie into smaller pieces.

Third, MIs may spare the implementation of costly and lengthy traditional enforcement steps. If firms identify the potential for enforcement steps through an MI that may affect their markets more than traditional enforcement activities, they might even end their anti-competitive conduct to avoid such steps. (p. 10)

Overall assessment

The Commission considers that the benefits of market studies are likely to outweigh their costs. Most importantly, market studies are a useful tool that may enable the Commerce Commission to develop a deeper understanding of the dynamics of specific markets and to identify a wider range of competition issues than those strictly relating to breaches of competition law. Market studies are not costless. However the way that market studies are funded and undertaken (discussed in the following section) may help to reduce costs.

Since the Commerce Commission can currently conduct market studies within the telecommunications industry, the Productivity Commission considers that there would be value in using that model to extend the Commerce Commission's powers to conduct market studies in any market in the economy. This would require a provision to be added to the Commerce Act similar to section 9A (1) (b) of the Telecommunications Act.

R7.5

The Commerce Commission should be able to undertake studies on competition in any specific market in the economy. To enable this, the Commerce Act 1986 should be amended to include a provision similar to s 9A (1) (b) of the Telecommunications Act 2001.

Design of market studies

As noted above, the design of market studies can best be achieved by adding a clause to the Commerce Act similar to that in s 9A of the Telecommunications Act. This would enable the Commerce Commission to draw on the existing processes that are used in conducting market studies in the telecommunications industry. There are four additional design features that should be considered if new market studies powers are introduced.

What resources should be directed toward market studies?

S 9A (1) (b) of the Telecommunications Act is drafted as follows:

[The Commerce Commission] *may* conduct inquiries, reviews, and studies (including international benchmarking) into any matter relating to the telecommunications industry or the long-term benefit of end-users of telecommunications services within New Zealand [emphasis added].

The use of the word "may" is distinct from other parts (of s 9A) that specify that the Commerce Commission *must* carry out certain functions.⁶² The Productivity Commission considers that the extended powers of inquiry should be granted to the Commerce Commission on the same basis – that is, a tool that they choose to use as they deem necessary to fulfil their existing role.

Accordingly, additional funding would not necessarily be needed to support this role. Rather, the Commerce Commission could sometimes opt to use market studies where warranted. Decisions about

⁶² For example, s 9A (1) (a) states that "[the Commerce Commission] *must* monitor competition in telecommunications markets and the performance and development of telecommunications markets" [emphasis added].

when to undertake a market study would need to be based on a judgement that doing so would be a more effective use of the Commerce Commission's resources than other courses of action available to it.

Without additional funding directed towards this task, it would be unreasonable to expect the Commerce Commission to respond to demands from external sources to conduct market studies. As such, the decision to launch a market study should be at the discretion of the Commerce Commission (as with market studies conducted under s 9A of the Telecommunications Act).

Evaluation should be used to assess market studies

Evaluation refers to a systematic and analytical assessment of important aspects of a government activity and its value, with a view to enhancing the future performance of the activity being evaluated (OECD, 2004). Market studies should be evaluated in keeping with the approach to evaluation set out in the Productivity Commission's draft report on *Regulatory institutions and practices* (NZPC, 2014b).

Donal Curtin (sub. 201, pp. 3–4) notes that the Commerce Commission "already has a process in place for retrospective review of some of its merger decisions, and a similar process for evaluating its market studies would fit comfortably with how it operates more generally".

Powers to compel the supply of information should be used with caution

International practice regarding powers to acquire information for market studies are varied (Box 7.6). Different approaches have a range of pros and cons. For example, powers to compel the supply of information might enable important evidence of anti-competitive behaviour to be accessed, but at the same time increase costs for businesses.

Section 98 of the Commerce Act gives the Commerce Commission powers to require a person to supply information or documents or give evidence where the Commerce Commission considers it necessary or desirable for the purposes of carrying out its functions. Although these same powers apply to the Telecommunications Act, these powers do not appear to have been used in any market studies completed to date. Any decision to make use of powers to compel the supply of information would need to be based on a careful assessment of the likely impact that invoking such powers would generate.

The ability to make recommendations

As noted earlier, policy and regulatory recommendations fall outside the Commerce Commission's jurisdiction under s 9A of the Telecommunications Act (Commerce Commission, 2012c). This is likely to severely curtail the impact of market studies and their ability to help inform the policy process.

As well as extending the markets that can be studied, there would be merit in enabling the Commerce Commission to make recommendations in market studies. This ability should be included in relevant legislation. The Commerce Commission already has significant knowledge and expertise regarding competition analysis. Enabling the Commerce Commission to include recommendations in its market studies would make better use of those capabilities.

Where a market study makes recommendations, a requirement for Ministers to respond to studies in a specified timeframe would be beneficial. An alternative approach would be for MBIE to coordinate a response to market studies. This would be consistent with the approach in the United Kingdom, where the Department for Business, Innovation & Skills is responsible for coordinating a government response to OFT market studies.

R7.6

The design of market studies should be based on existing practice under s 9A (1) (b) of the Telecommunications Act 2001. The ability to make recommendations in market studies would be a useful additional feature, and this should be clarified in the Telecommunications Act and the Commerce Act 1986.

8 ICT is revolutionising services

Key points

- Information and communications technology (ICT) underlies a revolution in services. ICT is transforming many existing services and creating new ones similar to the way in which previous general purpose technologies – such as steam and electricity – transformed manufacturing and agriculture.
- The economic characteristics of ICT include strong economies of scale, non-rivalry and network effects. These underlie its strong current and potential future contributions to productivity, economic growth and wellbeing.
- ICT is disruptive. Its effects across the economy are pervasive and have a significant impact on service industries. Firms, industries and countries will be better off if they can adapt nimbly, and at lower cost, to this disruption.
- The application of ICT often devalues existing assets while creating new opportunities for profit. Affected assets include firms, business models, brands, and human and physical capital.
- The reallocation of assets – putting them to more productive uses – is the single largest contributor to productivity growth. It operates across firms, industries and regions.
- Adjustment costs – the costs incurred in redeploying devalued assets – discourage reallocation. Policies aimed at reducing adjustment costs can contribute to productivity growth.
- ICT adoption increases productivity growth. This effect is strong in some countries over some time periods and in some industries, particularly service industries. The effect appears to be weaker in New Zealand, particularly for the distribution industries (retail, wholesale and transport).
- Firms need to invest in ICT to get the benefits. Per-capita ICT investment in New Zealand has been lower than some comparable advanced countries.
- Countries face choices of policies and institutions that influence the way they respond to, and take advantage of, the ICT revolution. These choices are best made in a thoughtful and informed way, to avoid the risks of an uncoordinated set of policies and institutions that work against each other and dissipate potential gains.

ICT is a broad term covering products that fulfil or enable information processing or the communication of information by electronic means (OECD, 2003). ICT is a revolutionary technology, with particularly strong effects on the services sector. ICT is lifting productivity by transforming the way that existing services are delivered, and by creating new services.

This chapter begins by setting out the scale of change in the services sector resulting from greater use of ICT (section 8.1). Section 8.2 identifies the particular economic characteristics of ICT that underlie both its disruptive and its productivity-enhancing effects. Section 8.3 summarises research on the impact of ICT on productivity in service industries, in New Zealand and elsewhere. The chapter ends by discussing what the ICT revolution means for New Zealand and its implications for broad policy choices (sections 8.4 and 8.5).

Following this scene-setting chapter, the next three chapters explore in more depth different aspects of adoption of ICT by New Zealand firms, particularly service firms. This includes the choices of whether and when to adopt particular ICT, how that ICT is applied, and policies that impact on these choices. Box 8.1 provides an overview of the other chapters examining ICT adoption in the services sector and also sets out the ICT issues that are outside the scope of this inquiry.

Box 8.1 An overview of the ICT topic

Chapter 9 covers ICT adoption by firms and the business and policy influences on adoption decisions. It examines the policy levers that can ease the adoption of ICT by New Zealand firms to obtain faster productivity benefits.

Chapter 10 investigates the supply of and demand for ICT skills. Firms need a robust supply of professional and managerial ICT skills to get the benefits of ICT investments. New Zealand firms compete in an international market for these skills. There have been worldwide difficulties in matching the supply of skills to firms' demands.

Chapter 11 covers cloud computing – a specific example of a new ICT. A great many technologies and trends compete for the attention of suppliers, customers and commentators. Cloud computing is a particularly influential trend that could have disproportionate costs and benefits for New Zealand service firms, given the country's geographic isolation.

Many important policy issues concern consumer use of ICT; for example, the availability and uptake of residential broadband. These issues are outside the scope of this inquiry.

Firms that produce ICT – particularly those targeting international markets – have interesting economic characteristics and are the target of much public interest and government policy. Such firms are in scope to the extent that they are service firms or they supply services to other New Zealand firms. They are not the main focus of the topic.

Technology adoption involves processes and products that are new to a firm. Adoption may, but need not, include developing new-to-world processes and products. Government innovation policy promotes new-to-world development in the form of "research and development" (R&D). Policy may foster links between firms and public sector organisations, including universities and Crown Research Institutes. Innovation policy and institutions are important for economic development; however they are not within the scope of this topic.

8.1 ICT – the "steam engine" of services

Steam power, the internal combustion engine, electricity and ICT

ICT is catalysing social and economic changes on a scale comparable to those resulting from previous breakthrough technologies such as steam power, the internal combustion engine, and electricity. In conducive economic environments, these technologies were largely responsible for the huge rises in the material living standards of much of the world's population since the late 1700s. Such breakthrough technologies occur rarely – perhaps less than once in a generation.

Much can be learnt from those earlier eras of rapid, sustained and far-reaching change. Economic historians have noted striking similarities between them – similar patterns in the nature and reach of the changes, the benefits delivered and costs suffered while transitioning from the old era to the new era. Economists call technologies with such revolutionary and far-reaching effects "general purpose technologies".

General purpose technologies

The disruptive and far-reaching impacts of ICT make it an example of a general purpose technology (GPT). GPTs typically have applications in many, if not most, economic activities. Previously important GPTs include steam power, the internal combustion engine and electricity (Crafts, 2011).

GPTs are characterised by:

- *pervasiveness* – GPTs become widely used because of the number and variety of their potential applications;

- *improvement* – GPTs get better over time and so keep lowering costs for their users; and
- *innovation spawning* – GPTs make it easier to invent and produce further new goods, services and processes (Bresnahan & Trajtenberg, 1996).

These three characteristics are evident with ICT (Crafts, 2003). ICT was first applied to tasks requiring rapid and routine calculations such as banking and accounting. Applications have spread to most industries, including health, manufacturing, wholesale trade and agriculture.

The onset of a new GPT is typically slow and uneven. Productivity usually dips in the early stages as the GPT disrupts traditional production and skills, sparks experimentation and learning, and ignites significant new investment that is either not immediately productive or turns out to be non-productive (Jovanovic & Rousseau, 2005). Productivity rises later, as benefits are realised.

General purpose technologies underpin “industrial revolutions”

The ramifications of the most historically influential GPTs were pervasive enough for them to be associated with the periods of change known as *industrial revolutions*. Gordon (2012) classifies US economic history into three industrial revolutions. The first (1750–1830) was powered by steam and railroads. The second (1870–1900) was sparked by electricity, the internal combustion engine, running water, indoor toilets, communications, entertainment, chemicals and petroleum. The third (1960 to the present) is the *ICT revolution* brought on by microprocessors, the internet and mobile phones.

Each revolution continued to spin off technologies over a long period. For example, the second revolution spawned aeroplanes, television and air conditioning.

The first and second industrial revolutions led to vastly improved economies of scale in producing goods. By the middle of the twentieth century, productivity improvements in primary and goods-producing industries were far outstripping those in service industries, and the productivity growth prospects for service industries looked bleak (Baumol, 1967).

A defining feature of the ICT revolution is how it applies to services. While goods production has benefited, the revolution enabled by ICT is having its largest impacts on services⁶³. ICT has unlocked economies of scale in many existing services and created new services similar to the way in which GPTs, such as steam and electricity, transformed manufacturing and agriculture. Extending this analogy, ICT is the “steam engine” of services.

F8.1

ICT is transforming existing services and creating new ones. Its economic and social effects are comparable to those of previous general purpose technologies, such as steam and electricity, which transformed manufacturing and agriculture.

It takes time to learn how best to produce and apply GPTs (Lipsey, Bekar & Carlaw, 1988). The economic effects of previous GPTs have taken many decades to work through an economy (Crafts, 2011; Gordon, 2012). It is hard to predict how long the ICT revolution will continue, though most agree it has a long way to go (Box 8.2).

Box 8.2 How long will the ICT revolution continue?

Gordon (2012) argues that productivity improvements from the ICT revolution had faded in the United States by 2004, and that the revolution has run its course. Others have challenged Gordon’s view with data showing that the productivity improvements from ICT have continued and will likely continue (Byrne, Oliner & Sichel, 2013; Brynjolfsson & McAfee, 2011).

⁶³ For example, Zand, Van Beers and Van Leeuwen (2011) report that “Firms in the services sectors of the economy enjoy higher marginal products of IT (almost two times) than their manufacturing counterparts” (p. 34).

Syverson (2013) acknowledges a slowdown in productivity in the United States between 2004 and 2012, but draws parallels with the uneven productivity growth in the era of electrification. History “shows that productivity growth driven by general purpose technologies can arrive in multiple waves; it need not simply arrive, give what it has, and fade away forever thereafter” (p. 39).

ICT costs continue to fall (section 8.2) and the diffusion rate for new ICTs appears to be accelerating (Box 8.3), suggesting the ICT revolution has a long way to run.

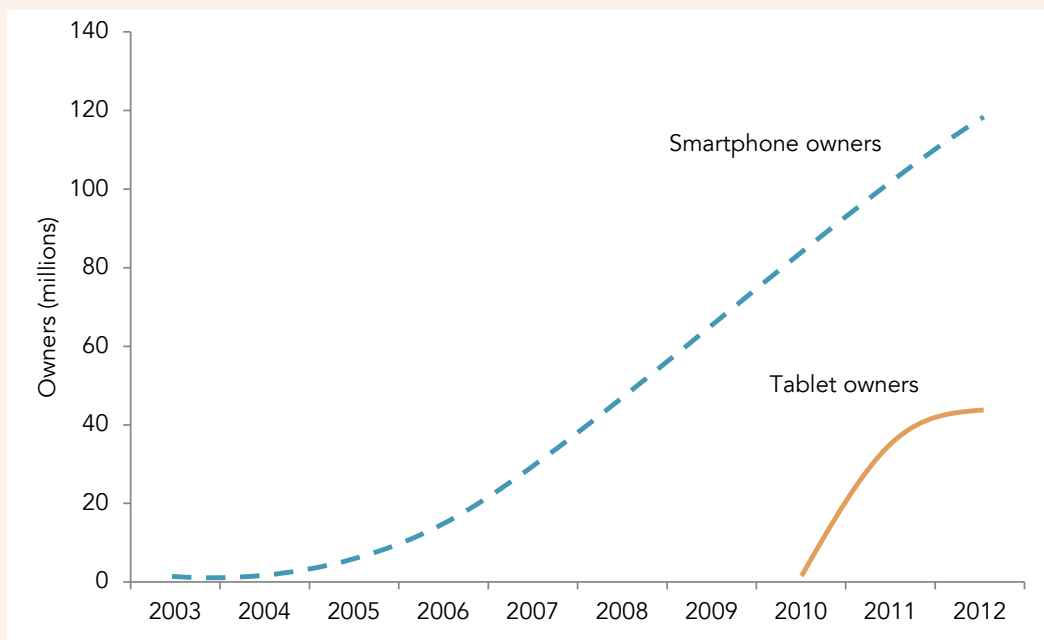
ICT is highly disruptive

ICT is diffusing very quickly, both within and across countries (Box 8.3). These diffusion rates are unprecedented. The average delay between the first country to adopt a major new technology and other countries adopting that technology was 47 years over the past two centuries (Comin & Hobijn, 2008). Diffusion rates have accelerated over this whole period, and adoption delays are now dramatically shorter – especially for new ICT.

Box 8.3 Fast and faster diffusion – the smartphone and the tablet

Less than a decade after the BlackBerry (2003), and only five years after the launch of the original iPhone (2007), by 2012 the majority of mobile consumers in the United States, the United Kingdom, France, Germany, Spain and Italy owned a smartphone (comScore, 2013). And tablets diffused even faster (Figure 8.1).

Figure 8.1 Smartphone and tablet owners in the United States, 2003–2012



Source: comScore, 2013.

Sixty-four percent of New Zealanders aged between 15 and 65 currently own a smartphone. Ownership is expected to grow strongly, reaching 90% penetration by 2018. Twenty-six percent currently own a tablet and 42% of all households have at least one member who owns a tablet. Penetration of tablets is predicted to increase to 78% by 2018 (Frost & Sullivan, 2013a).

The markets for mobile devices are extremely volatile. Company fortunes change very quickly.

In 2005, the US market was dominated by Palm, Nokia and BlackBerry. However, by the following year all three had ceded control to Microsoft as the new market share leader. 2008–2010 saw

BlackBerry stage a comeback to assume the number one position before eventually giving way to the upstart Android platform in 2011. The only key player in the current smartphone market never to have owned the market share lead, interestingly enough, is Apple. (comScore, 2013, p. 29).⁶⁴

These mobile devices are disrupting other industries.

Many US consumers have come to rely on their smartphones to assist with their in-store shopping, arming them with information in the palm of their hands to ensure they are getting the right product at the best available price. This behaviour, known as “showrooming”, is putting significant price pressure on brick-and-mortar retailers as they are forced to compete with e-commerce retailers within the confines of their own stores. With the pricing power so clearly in the hands of the consumer today, the retail industry is rapidly being disrupted as e-commerce grows at 4x the rate of traditional retail while accounting for 1 out of every 10 retail dollars. Brick-and-mortar retailers are being faced with the need to quickly adjust with aggressive defence strategies. (comScore, 2013, p. 8)

Shifts in relative prices strand assets and create opportunities

The rapidly falling quality-adjusted price of ICT makes it cheap relative to other business inputs. In response, businesses use more ICT and find additional ways in which to apply it profitably.

This in turn enables its wider use in the production of goods and services, supporting follow-on reductions in the quality-adjusted prices of those goods and services. For example, airline booking websites have reduced airline costs and airfares.

Such rapid price falls can undermine the value of existing assets, including business models, physical assets and the knowledge and skills of people. A somewhat ironic example is the word *computer*, which dates from 1613 (Oxford University Press, 2008). It described an occupation – those employed to perform mathematical calculations. Commercial availability of mechanical and then electronic computers made human “computers” redundant. The term was appropriated to name the new devices.

Rapid price falls also create business opportunities. The falling costs of personal computers and internet connectivity in the 1990s supported their wide diffusion, creating many opportunities such as those that Google and Facebook successfully exploited.

Firms, industries and countries will be better off if they can adapt quickly – and at lower cost – to the opportunities that ICT creates and the devaluation of existing assets.

Shifts hard to predict

ICT is continuously spawning further innovations. These innovations and their effects are even more challenging to predict than those arising from relative price shifts. For instance, as recently as 2004 it was thought that driving in traffic was a task that could not be automated, meaning that truck, bus and taxi drivers would never be displaced by computers (Murnane & Levy, 2004). Yet since then huge leaps have been made in developing and testing driverless cars (Fagnant & Kockelman, 2013). Their widespread use looks increasingly likely, perhaps within the next decade.

These features of ICT make planning for change difficult and unreliable. For businesses, they favour responses that are experimental and flexible. Trying many approaches, while retaining the flexibility to back out of unsuccessful ones, is likely to offer better results. Policy needs to allow firms the flexibility to adjust to emerging technology possibilities.

F8.2

Firms, industries and countries will be better off if they are flexible and adapt quickly – and at lower cost – to the opportunities that ICT creates and the devaluation of existing assets.

⁶⁴ Minor edits were made to this quoted material to improve its clarity.

“Creative destruction” and reallocating resources

Creative destruction – also called *Schumpeterian growth* – describes the process of innovations replacing older technologies.

Day in, day out, jobs are created and destroyed through businesses’ openings, closings, expansions, contractions and relocations. Entrepreneurs start companies, some of which will meet the test of the marketplace and flourish. Eventually, many of these enterprises will be eclipsed by other companies that offer consumers newer and better products. In this way, an economy continuously re-creates itself through a process of “creative destruction”... This natural process of replacement of business enterprises by new or reformulated companies redefines existing jobs and creates new industries. Eventually – and continually – this process reconstitutes and restructures a nation’s economy. It is this churning of business enterprises and their work forces in a free enterprise economy that spurs income growth and creates wealth. (Cox & Alm, 1992, pp. 4–5)

The photographic industry provides a vivid example of the destruction of a traditional industry by a new ICT. Dominated for decades by a single technology (film) and a few large companies, the digital camera largely destroyed the value of film production and processing companies such as Kodak. And while many film-camera companies successfully transitioned to the digital camera business, mobile phones are now eroding their business. Meanwhile, a plethora of new service businesses have emerged that handle digital photo collections (such as Flickr and Instagram).

GPTs are Schumpeterian in nature. As they spread across the economy, they typically cause older technologies to be abandoned (Aghion, Akcigit & Howitt, 2013). This process rarely proceeds smoothly.

Productivity growth occurs through reallocation

Creative destruction involves three mechanisms that reallocate market share and inputs between existing firms and between existing and new firms:

- firms that increase their productivity expanding at the expense of firms that do not;
- lower-productivity firms exiting the market; and
- new firms entering the market and growing their employment and productivity.

These reallocation mechanisms contribute as much as 70% to 80% of productivity growth in the United States (Acemoglu et al., 2013). One study estimated that entry and exit were responsible for about one third of this productivity growth. Reallocation between existing firms was responsible for the other two-thirds (Lentz & Mortensen, 2010).

The 20% to 30% of productivity growth not due to reallocation came from increases in productivity within firms (Acemoglu et al., 2013). Yet the threat of reallocation – losing market share – drives the innovation and greater efficiency behind this growth too. The reallocation of inputs such as labour between industries will affect aggregate productivity if those inputs have different levels of productivity in different industries. This effect is considered in Chapter 4.

The dynamism of reallocation varies between countries. This variation contributes to differing levels of productivity across countries (Bartelsman, Haltiwanger & Scarpetta, 2012).

F8.3

Productivity growth from new ICT occurs largely through a process of “creative destruction” – the reallocation of resources towards successful existing firms and to new firms, and away from less successful existing firms. Reallocation is the single largest contributor to productivity growth. It operates across firms, industries and regions. Adjustment costs – the costs incurred in redeploying devalued assets – inhibit reallocation. Policies aimed at reducing adjustment costs can contribute to productivity growth.

Advantage goes to those who can “recycle” assets efficiently and grasp opportunities

Change is inherent in productivity growth, and always has been. The changes brought about by ICT are no different in this sense from earlier revolutionary technologies; however the speed of change is faster.

As with earlier periods of disruption, firms that can efficiently recycle assets and grasp opportunities (ie, innovate) will get ahead. This also applies at the national level. The countries that prosper will be those with institutions and policies that support an environment that allows firms to efficiently recycle and innovate (Chapter 9). Such disruption can create severe difficulties for some people, for example if their skills become less valued as a result of new technology. It is important that processes are in place to support these people through change (section 8.5).

Driven by competition

The intensity of competition is an important driver of productivity growth (Chapter 5).

The extent of reallocation depends on intensity of competition. Firms with low productivity may be able to survive – and even prosper – if there is a low competitive intensity in the market for their products. A well-performing competitor provides both direct pressure (through competition for customers) and unintended help (through information about how to improve performance).

Efficient reallocation requires that low-productivity firms either improve their productivity or exit the market. Policies that create high exit costs, such as strict land-use regulations and regulations that overly protect existing employment, can encourage low-productivity firms to stay in business longer than ideal. The effect is lower aggregate productivity caused by tying up assets that could be redeployed to higher-productivity firms (in the same or a different industry).

Firms also compete for investment funds, talented staff and other productive inputs. These input markets are an important discipline on firms (Jensen, 1993). One reason is that a firm faces different and often more varied competitors in its input markets than it does in its product markets.

Competition policy is important in maintaining and promoting competitive intensity. Chapter 7 discusses improvements to some aspects of competition law – an important component of competition policy. Openness to international trade and investment also bolsters competition (Chapter 5).

8.2 Economic characteristics of ICT support productivity growth

ICT and the digital content it enables have some specific economic characteristics that make them somewhat different from typical goods. These characteristics are pervasive in ICT, can interact in complex ways, and make ICT such an important driver of productivity growth.

Falling prices

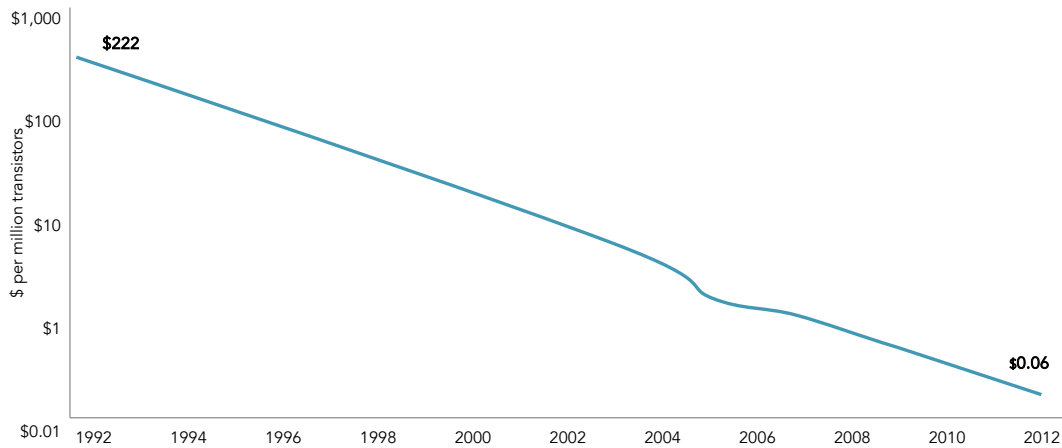
Improvements in transistors (a fundamental building block of ICT) and other components account for the annual 20% to 30% quality-adjusted price decline for computers (Brynjolfsson & Hitt, 2003).

Figure 8.2 shows the falling cost of transistors over the past two decades. The near-linear relationship on the log scale visually hides the dramatic dollar price decline in transistors. Advances in technology have allowed exponentially more transistors to be placed on microchips over time (Moore, 1965), and driven price falls. Similar exponential trends apply to pixels per dollar,⁶⁵ network capacity⁶⁶ and other measures of digital technology.

The rapid declines in the price of microchips have in turn led to similar declines in the prices of products that use microchips, such as computers, televisions and cameras.

⁶⁵ “Pixels per dollar” – a measure of value for digital cameras – also follows a linear trend (on a log scale). Over time the amount of pixels that \$1 can buy has increased dramatically.

⁶⁶ The quantity of data that can be transmitted along an optical fibre is doubling every nine months, with a similar effect on prices.

Figure 8.2 The falling costs of transistors (\$ per million), 1992–2012

Source: Deloitte, 2013.

Note:

1. US prices in US dollars.

High fixed and low marginal costs create economies of scale

The combination of high fixed costs and low marginal costs creates economies of scale. Productivity increases as production increases.

This combination is a feature of much ICT. Software is a typical example – it takes a lot of time and money to develop a program and test it for its first user. Yet the cost involved in making it available to each extra user is much lower, and can approach zero.

The fixed costs of production for an ICT product can be spread across customers with the same requirements. So customers whose requirements are widely shared can purchase the product at the (generally very low) average variable cost⁶⁷. Customers who assemble and adapt standard components to meet their requirements also benefit through lower component prices.

However, customers whose needs differ significantly from the mass of the market may face significant costs for *bespoke* technology (ie, products made to the specific requirements of one customer). Firms with non-standard requirements often face a difficult decision between high-cost bespoke technology that fits their current business processes and changing their processes to take advantage of cheaper, but standardised technology.

High fixed costs are a barrier to entry, as new entrants need to cover these costs before earning any revenue. In stable industries this cost structure can create the conditions for oligopolies or natural monopolies, with depressive effects on innovation. However, when technology is fast-changing, existing firms must continuously innovate in case any market power is short-lived (Christensen, 1993; Box 8.3).

ICT typically encourages and facilitates increased scale in the firms that use it. But in particular situations ICT can support the entry of smaller firms and act to change the scale at which firms operate most efficiently (Chapter 11).

Information is non-rival and only partially excludable

Unlike traditional goods, information is, in general, *non-rival*. Non-rivalry means its consumption by one person does not reduce its value to others. For example, music does not become less valuable to listeners should others hear it.

⁶⁷ Plus a profit margin to the supplier.

Non-rivalry and technology that dramatically lowers the cost of transporting and copying information are a powerful combination. This permits enormous economies of scale when creating and disseminating digital content.

Also unlike traditional goods, it is difficult to exclude access to information. For example, selling one's knowledge inevitably involves copying that information, and the recipient can copy it to others.

One consequence of the limited excludability of information is knowledge spill-overs. These occur when investigations, research and learning spread to other firms and individuals. The recipients gain from that knowledge without having to pay for its creation. These spill-overs are generally positive. However they can discourage firms and individuals from creating new knowledge if creators do not expect to be able to capture sufficient returns to cover their investment.

Network effects

Network effects occur when a product becomes more valuable to customers as more customers choose to use it (Shapiro & Varian, 1999). In the case of new ICT, network effects influence which firms invest and when. For example, video-conferencing equipment is only useful to a firm if its associates possess compatible equipment.

Network effects can also occur when it takes time to learn about new ICT (Shapiro & Varian, 1999). A pool of existing users reduces the cost for later users to obtain advice and to hire people with relevant skills.

The ability of a provider to capture the value from network effects is reduced when customers can multi-home (ie, make use of more than one competing network such as Skype or FaceTime) or when systems become interoperable (eg, text messaging between users on different networks).

Generally speaking, the combination of competing networks and interoperability leads to good outcomes for consumers.

Winner-take-all markets

Economies of scale in production can create "winner-take-all" markets⁶⁸ – in which a single firm can become dominant.

Economies of scale in consumption (network effects) act to strongly reinforce economies of scale in production. When both apply, winner-take-all markets are highly likely.

Such markets offer a *first-mover advantage* – the first firm to bring a successful product to market has a huge advantage over later entrants. Examples of ICT-based firms that have benefited from first-mover advantage include Trade Me and Facebook – both of which remain dominant in their respective markets despite the efforts of rival firms.

Late adoption can be costly in these markets. Risk-taking and experimentation are essential to gain a first-mover advantage. Whether New Zealand has the right settings to encourage risk-taking by businesses is an important question (Chapter 9).

Accelerating the innovation process

Recently the link between traditional investments in the inputs of innovation (such as R&D and hiring scientists) and growth in productivity has declined. Yet the link between investing in ICT and innovation (and so growth in productivity) has increased significantly (Brynjolfsson, 2011; Box 8.4).

⁶⁸ Such markets are also called *natural monopolies*.

Box 8.4 ICT is accelerating the innovation process

ICT is increasing the pace of innovation and changing how innovation occurs. Improved or lower-cost measurement, experimentation, sharing and replication are accelerating innovation.

- Real-time, detailed *measurement* of business activities: Firms can obtain data on consumer behaviour by observing their searches, website traffic and online purchases. Such data supports a shift to decision making based on numbers rather than intuition.
- Faster, cheaper and more frequent business *experimentation*: Historically, experimentation was costly, slow and inconvenient. Yet now some firms can develop and test a hypothesis within a day, for example by randomising the information and offers they present to their online customers.
- Widespread *sharing* of information, observations and ideas: Information is increasingly being stored digitally, enabling cheap replication and transportation. This has improved how the scientific community, firms and employees collaborate.
- Increased ability to *replicate* innovations: Innovations can be quickly and cheaply replicated over the whole firm.

These four ways of accelerating innovation do not occur automatically. A skilled workforce that can adapt to change is needed. Employees with skills in experimental design and analysis will further increase the pace of innovation. Innovation is more likely in environments with flexible institutions, including labour-force and regulatory policies.

Source: Brynjolfsson, 2011.

Importance of complementary investments

Turning investment into higher productivity growth is not a straightforward process (Pilat, 2004). Extracting the highest possible returns from ICT requires complementary investments and business changes:

...a significant component of the value of information technology is its ability to enable complementary organizational investments such as business processes and work practices; ... these investments, in turn, lead to productivity increases by reducing costs and, more importantly, by enabling firms to increase output quality in the form of new products or in improvements in intangible aspects of existing products like convenience, timeliness, quality, and variety. (Brynjolfsson & Hitt, 2000, pp. 24–25)

Complementary factors associated with ICT investment include skills and organisational changes.

- *Skills*: There is a strong link between the level of human capital in firms and the productivity-growth benefits of ICT use (Gretton, Gali & Parham, 2004). Firms with a high proportion of skilled employees also tend to be early adopters and the heaviest users of ICT.
- *Organisational changes*: Firms that combine ICT investment with organisational changes (such as new strategies, new business processes and practices, and new organisational structures) typically achieve higher benefits from ICT. The most successful changes are those that give individual employees more responsibility (Bloom, Sadun & van Reenen, 2012).

The case study in Box 8.5 explores an example of the returns from complementary investments.

Box 8.5 Case study: Walmart and complementary investments

Starting with a single store in Arkansas in 1962, Walmart grew to 4 000 US stores with 1.3 million employees by 2007. An estimated half of US labour productivity growth in the general merchandise retail sub-industry between 1982 and 2002 was attributable directly to Walmart (Basker, 2007). Walmart's prices were about 10% lower than competitors' prices in the 2000s. Entry of a Walmart store led to a fall in competitors' prices in the same location of between 1% and 2%.

As early as the late 1970s all Walmart stores and distribution centres were connected by a computer network. Walmart installed barcode readers throughout its operations by the late 1980s and inventory management software in 1990. In the 2000s it mandated the use of radio-frequency identification (RFID) by its suppliers. General merchandise is characterised by low margins on each item, so improving efficiencies across the supply chain can increase profits substantially (McKinsey, 2002).

Complementary investments in strategically placed stores and cross-docking distribution centres leveraged Walmart's ICT investments.

Walmart's expansion strategy has centred on locating new stores close to existing distribution centres – optimising the trade-off between reducing distribution costs and cannibalising the sales of existing stores. New stores help capture the benefits of the increased scale that ICT facilitates. New cross-docking distribution centres use ICT to identify and sort incoming shipments and reallocate them to outgoing shipments. Reduced costs from the use of ICT have allowed the Walmart chain to expand at about 12% each year, reaping further benefits from economies of scale (Basker, 2007).

Brynjolfsson & Hitt (2000) estimate that the total capital stock associated with computerising the economy may be significantly understated in official measures:

... case studies and econometric work point to organizational complements such as new business processes, new skills and new organizational and industry structures as a major driver of the contribution of information technology. These complementary investments, and the resulting assets, may be as much as an order of magnitude larger than the investments in the computer technology itself. (Brynjolfsson & Hitt, 2000, p. 45)

This suggests that the economic contributions of ICT are likely to be understated in aggregate level analyses. It also draws attention to the importance of non-ICT investments in determining the business case for investing in ICT. This subject is explored further in Chapter 9.

F8.4

Extracting the highest possible returns from ICT requires complementary investments, including changes in business organisation. These complementary investments are typically more expensive than the direct cost of ICT.

ICT contributes to productivity, economic growth and wellbeing

One common attribute of the economic characteristics described above is *increasing returns*; that is, outputs grow more rapidly than inputs. Increasing returns make for sensitivity to initial conditions⁶⁹, path-dependence⁷⁰, and cumulative causation⁷¹. Accordingly, developments can move ahead very fast or hardly at all. Making predictions is difficult and they can be unreliable.

Increasing returns are central to achieving productivity and economic growth.⁷² These effects are so strong in ICT that their contribution (and potential future contribution) to wellbeing are very high.

⁶⁹ "Sensitivity to initial conditions" means that a change in initial conditions may result in a disproportionate change in outcomes.

⁷⁰ "Path dependence" means that the future track of outcomes is dependent on the path followed to date.

⁷¹ "Cumulative causation" is the unfolding of positive outcomes based on a favourable starting point (or the converse).

⁷² Growth in the value of output that does not require a growth in (physical) inputs means that resulting economic growth is consistent with concepts of sustainable development.

F8.5

The economic characteristics of ICT include powerful economies of scale, non-rivalry and network effects. These economic characteristics underpin ICT's strong current and potential future contributions to productivity, economic growth and wellbeing.

8.3 ICT and the productivity of service industries

ICT is important to services; both as the basis of some service industries (eg, software services) and in how it contributes to other service industries.

Linking ICT and productivity

The volume and penetration of ICT in the 1970s and 1980s grew without any corresponding increase in US national-level measures of productivity (Solow, 1987). This lack of any observable effect became known as the ICT "productivity paradox" (Brynjolfsson, 1993).

The productivity paradox proved temporary. Later research showed that the industries that produced ICT and those that used ICT intensively were together responsible for the "revival" of US productivity evident between 1995 and 2000 (Stiroh, 2002; Jorgenson, Ho & Stiroh, 2005). ICT-intensive service industries such as retail, wholesale and finance contributed significantly to the revival (Triplett & Bosworth, 2004).

Interestingly, Europe did not experience such a rapid increase in productivity in the same industries (Box 8.6).

Box 8.6 ICT and productivity – different outcomes in Europe and the United States

Europe did not experience the rapid productivity growth in the same industries as the United States (Strauss & Samkharadze, 2011). This contributed to significantly lower aggregate productivity growth in Europe (Dahl, Kongsted & Sørensen, 2011), but was not the only reason for the difference (Ortega-Argilés, 2012).

Timmer et al. (2011) examined why labour productivity growth in Europe has declined since the 1990s while US labour productivity has grown substantially. They found that:

- faster multi-factor productivity (MFP) growth in the United States was the main difference compared with the European Union;⁷³
- more investment in ICT led to greater ICT capital deepening in the United States; and
- the United States adapted better to the growth in market services than the European Union. Market services contributed 1.2 percentage points to yearly average labour productivity growth in the United States and only 0.6 percentage points for the EU-15⁷⁴ between 1995 and 2007.

Jorgenson, Ho & Stiroh (2008) studied the effect of IT on US growth in labour productivity. They found that IT played a critical role in the United States when that country's productivity surged after 1995:

- from 1973 to 1995 labour productivity grew on average only 0.85% each year; and
- from 1995 to 2000 labour productivity grew on average 2.7% each year, with the deepening of IT capital contributing 1 percentage point each year to that growth; and
- a large part of the US MFP growth (1.0 percentage point each year from 1995 to 2000 and 0.9 percentage points each year from 2000 to 2006) was from industries that produced IT.

⁷³ The 10 European Union countries studied were Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Spain, and the United Kingdom.

⁷⁴ This analysis covered 15 EU countries.

O'Mahony and Vecchi (2005) measured the long-run effect of ICT on real output growth for the United States and the United Kingdom from 1976 to 2000. The authors found:

- a long-run relationship between ICT capital, non-ICT capital, labour and real output;
- a positive and statistically significant relationship between ICT capital and real output growth for the United States; and
- no evidence of a positive relationship between ICT capital and real output growth for the United Kingdom.

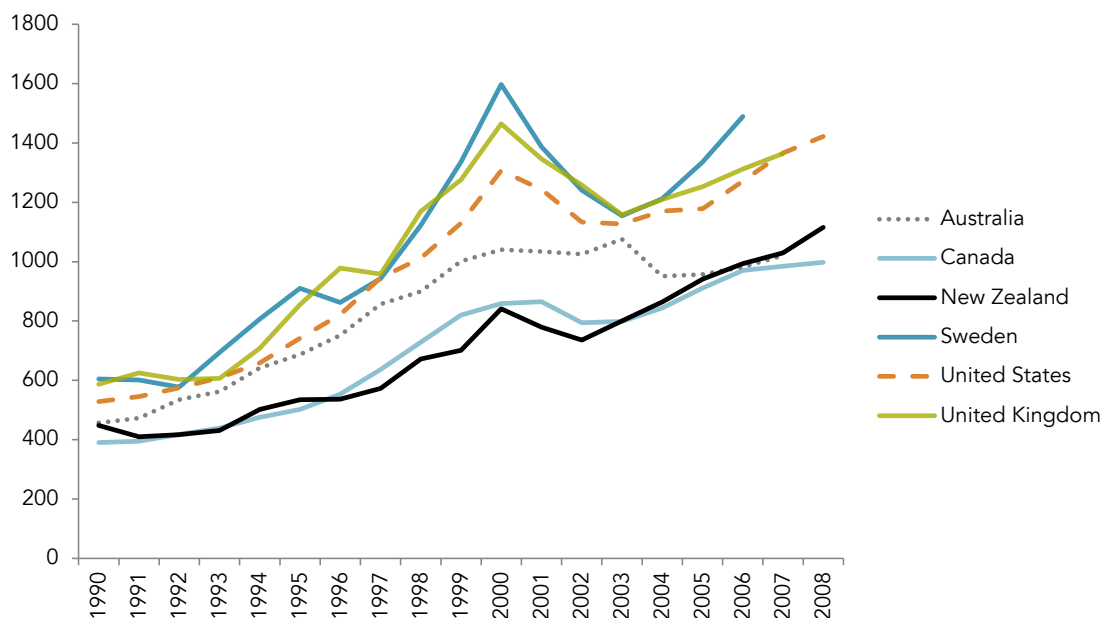
O'Mahony and Vecchi suggest that the United States has seen a greater benefit from ICT due to earlier adoption than other countries. They also argue that a lack of skills needed to reorganise production helps to explain the difference in returns from ICT between the United Kingdom and the United States.

Extensive international research highlights that industries that produce ICT can achieve very high productivity growth, and that countries that do not adjust well to a service-based economy will see productivity growth slow.

ICT capital investment: international comparisons

New Zealand's investment in ICT as a percentage of GDP is about average compared to a selection of OECD countries (NZPC, 2013c). Yet New Zealand's GDP per capita is lower than the other countries in the comparison meaning New Zealand's effective investment in ICT per capita has been relatively low (Figure 8.3). It is about the same as Canada but significantly below the United States, the United Kingdom and Sweden. Yet since the early 2000s New Zealand's investment has increased relative to Australia's investment, and was similar in 2005–2008.

Figure 8.3 Per capita investment in ICT, 1990–2008



Source: OECD National Accounts Statistics.

Notes:

1. Y-axis is 1995/96 US dollars; "Investment in ICT" is ICT gross fixed capital formation; 2008 is the latest year for which data was available (as at April 2014).

F8.6

Per-capita investment in ICT in New Zealand has historically been lower than that in most other comparable advanced countries.

ICT has driven productivity growth in New Zealand

New Zealand industries that produce ICT, or are relatively intensive users of ICT, have tended to show stronger productivity growth than less ICT-intensive industries. This is broadly consistent with the experience of other OECD countries.

Engelbrecht and Xayavong (2006; 2007) examined the link between ICT intensity (an index that measures the percentage of ICT inputs among all the inputs that firms use) and labour productivity growth in 29 New Zealand industries from 1988 to 2003. They found that labour productivity growth for more ICT-intensive industries was similar between the two sub-periods 1988–1992 and 1993–2003, but growth in labour productivity for less ICT-intensive industries declined dramatically between the two periods. They took this as evidence for the benefits of ICT. Statistics New Zealand (2013c) decomposed the contribution of IT⁷⁵ to growth in labour productivity for 20 industries from 1978 to 2011, and from 1996 to 2011 for a further five market-based industries. The study found:

- the amount of IT capital per worker strongly contributed to growth in labour productivity in the information, media and telecommunications, finance and insurance, and professional, scientific, and technical industries;
- a contribution, but to a lesser extent than in the above industries, of IT capital per worker to growth in labour productivity in the wholesale trade; retail trade; printing; transport equipment; machinery; and equipment-manufacturing industries; and
- IT contributed 0.5 percentage points a year to the 1.5% average yearly growth in labour productivity from 1996 to 2012. By incorporating new technology and enabling organisational changes, IT investment is also likely to enhance MFP. MFP growth contributed a further 0.5 percentage points a year to the growth in labour productivity.

Research examining the economic impact of the internet finds that firms making extensive use of internet services are 6% more productive than average firms in their industry (Glass et al., 2014). The Commission's business survey also points toward positive impacts from ICT adoption. 68% of participating service firms that invested in ICT reported increased competitiveness or profitability as a result. Only 1% reported decreased profitability.

F8.7

ICT is making a positive contribution to productivity in New Zealand. Its contribution is stronger in service industries.

8.4 Choices for New Zealand

New Zealand, like other countries, has choices in the face of the ICT revolution. The environment for all countries is one of rapid advances in ICT, and numerous disruptive economic changes. Each country has the opportunity to choose policies and institutions that enable it to respond to the ICT revolution in a way that most enhances the wellbeing of its people. New Zealand should take a deliberate approach to choosing policies and institutions to take advantage of this opportunity.

This chapter, and Chapters 9 to 11, pull together research and analysis that lay out the choices available to New Zealand and how these choices influence the benefits and costs of the ICT revolution. A country's strategy must consider the pace and extent of change, its unpredictability, the process of competition and creative destruction, and the need to promote flexibility, adaptability and experimentation.

Governments will of course be concerned about the impacts of the ICT revolution on individuals as well as businesses in making policy choices. For instance, people whose formerly valued and useful skills are made redundant will face a difficult adjustment. Good policies can make the necessary transitions for affected

⁷⁵ IT covers computers and software, but excludes communications equipment. Statistics New Zealand was unable to measure communications equipment capital for their study, so it will understate the contribution of ICT.

individuals less painful but never straightforward. Countries need to fashion a response to the ICT revolution that extracts high benefits and distributes them widely.

The ICT revolution poses several strategic choices for New Zealand. The following questions illustrate the type of issues that New Zealand people, businesses and the Government should be thinking about.

Incremental vs. revolutionary improvement?

Research suggests that countries with higher reallocation costs specialise in industries where technical change tends to be incremental, and that those with lower reallocation costs specialise in more innovative products (Cuñat & Melitz, 2012; Samaniego, 2006; Andrews & de Serres, 2012). For example, Germany has strengths in high-quality traditional engineering products such as machine tools and cars. Small technical improvements in these products, including those based on ICT, happen fairly continuously. In contrast, different policy settings in the United States have encouraged radical innovation in new products and business models. Companies such as Amazon, Cisco and Apple have thrived in that environment.

Smart follower or a technology pioneer?

The policies and institutions that help a country to copy, adapt and implement new technologies developed elsewhere are different from those that help it to create leading-edge innovations (Aghion, Akcigit & Howitt, 2013). For example, countries with a strong track record in innovation tend to favour more stringent intellectual property protections, while countries that adapt technologies developed elsewhere tend to be less stringent. Another example is that smart-follower countries tend to have policies and institutions that are effective at importing knowledge, such as joint ventures with foreign firms and fostering people exchanges.

Making deliberate choices

Making choices in the ICT revolution is not easy because there are sometimes strong advantages to being first or being radical. The reasons for this lie in the economic characteristics of ICT (see section 8.2).

The best responses to the two questions posed above are not necessarily at one end of the spectrum or the other. More nuanced responses are possible and likely desirable (Box 8.7). But there are trade-offs involved, and decision makers should be cognisant of those trade-offs.

Box 8.7 Can New Zealand be a smart follower *and* a technology pioneer?

Some New Zealand industries are at or near the productivity frontier, while others fall well behind. This might suggest that technology pioneer policies should be applied to the first group of industries, and smart follower policies to the second group. The feasibility of such an approach depends on the type of market affected by those policies.

- Product market policies can generally be tailored by industry, though they are constrained to varying extents by free trade agreements.
- Intellectual property policies are difficult to tailor, and constrained by international agreements with reciprocal rights and obligations.
- Labour market policies usually apply across all industries.
- Capital market policies usually apply across all industries.
- Land-use policies are often tailored by industry.

The best choices for New Zealand will reflect the scope to tailor policies, and the strengths and weaknesses of its industries.

Perhaps the worst outcome would come from failing to make a deliberate choice. Making choices by default or in isolation risks an uncoordinated set of policies and institutions that lack coherence, work

against each other and dissipate potential gains.

New Zealand should carefully choose policies and institutions that match where the country is now – and where it wants to go. Section 8.5 outlines the policy challenges of disruptive change, and Chapter 9 considers the “framework” policies and institutions that will take best advantage of the ICT revolution.

F8.8

Countries face choices of policies and institutions that influence the way they respond to, and take advantage of, the ICT revolution. These choices are best made in a thoughtful and informed way, to avoid the risk of an uncoordinated set of policies and institutions, which work against each other and dissipate potential gains.

8.5 Policy and disruptive change in a “revolutionary” economy

A policy environment to support continuous adaptation

The overall picture that emerges in this chapter is a future of rapid change: technological, societal and economic.

A supportive environment for investment and innovation is ... paramount for a dynamic and productive economy. (Besley, Coelho & van Reenen, 2013, p. R9)

Dynamic firms and dynamic economies are interdependent. The successful countries will be those that continually adapt.

This future is not necessarily comfortable. Institutions that may have worked well in the past must be open to question, and abandoned or redesigned if they prove a costly drag on adaptation and adoption. Firms will be under pressure to change or will go out of business if they fail to change. Their employees will be directly affected. More broadly, the market value of the skills and experience of employees – and those who wish to work – will change in ways that are hard to predict.

The costs of inflexible regulation and high entry barriers are greater in this likely future. In general, firms have better information than others on the specific market conditions they face, and are in a better position to respond quickly. Delayed responses – because of industry protection or regulatory constraints – may lead to the sacrifice of long-term benefits and exclusion from winner-take-all markets.

In a rapidly changing environment, employees risk their skills becoming less valued, or even redundant. This reduces their bargaining power with employers. Employers face disruptions that affect their business models, business location, the skills required and the amount and type of physical capital they require. New competitors often come from other industries, in many cases with different cost structures (section 8.1).

In such an environment, there are rewards to flexibility at the individual, firm and national levels. On the other hand, governments that overreact or chop-and-change – or even just threaten to do so – may find their actions counter-productive in dynamic environments. So a balance must be struck between providing a stable regulatory environment and staying open to change brought about by emerging technologies.

F8.9

The ICT revolution is creating continuous disruption. In a disruptive environment, rewards to flexibility exist at the individual, firm and national levels.

F8.10

In a disruptive environment, governments must strike a balance between providing stable regulatory settings and staying open to change brought about by emerging technologies.

ICT is changing labour markets

ICT has reduced the demand for labour for routine manual and cognitive tasks, while increasing the demand for non-routine cognitive tasks (Autor, Levy & Murnane, 2003).

For example, Akerman, Gaarder and Mogstad (2013) find that broadband adoption⁷⁶ increased the productivity of university graduates in fields such as science, technology, engineering and business. By comparison, it substituted for workers without a high school diploma who perform routine tasks. As a result, broadband adoption made employment outcomes worse for low-educated workers. Workers performing manual tasks were unaffected by broadband adoption.

These two effects of ICT adoption – labour-complementing and labour-replacing – are behind the observed “hollowing out” of the labour market in OECD countries (Michaels, Natraj & van Reenen, 2010). The demand for well-educated workers increased more in industries with faster growth of ICT, while the demand for middle-educated workers fell more in the same industries.

It seems likely that this wave of technological disruption to the job market has only just started (*The Economist*, 2014; Box 8.8). The development of new capabilities in ICT and robotics means that computerisation of non-routine jobs is increasingly possible (Frey & Osborne, 2013). And for workers, the dislocations may arrive before the benefits.

In short, workers will find it more difficult to make educational investment decisions, will face increasing variance in pay, higher incidence of job displacement, and more uncertainty in life-cycle planning. (Bartlesman, 2013)

Box 8.8 Predictions of job losses from computerisation

Frey and Osborne (2013) assessed how susceptible different occupations are to computerisation and so job losses over the next two decades. In the past, computerisation has replaced manual and routine tasks, but it is fast developing the capability to replace non-routine tasks such as legal writing and truck driving. Frey and Osborne looked at the capabilities required in 702 occupations and likely ICT developments. Their model predicts the probability that jobs in each occupation will be lost over the next decade or two (Table 8.1). They did not attempt to estimate the number of jobs that will actually be automated.

Table 8.1 Probability that selected jobs will be computerised over the next two decades, 2013

Job ¹	Probability of job loss from computerisation ²
Dentists	0.004
Athletic trainers	0.007
Chemical engineers	0.02
Firefighters	0.17
Economists	0.43
Commercial pilots	0.55
Real estate sales agents	0.86
Technical writers	0.89
Retail salespersons	0.92
Accountants and auditors	0.94
Telemarketers	0.99

Source: Frey & Osborne, 2013.

Notes:

1. This table shows a small subset of the jobs presented in Frey and Osborne (2013).
2. Probability that jobs will be lost in the next decade or two.

⁷⁶ Productivity benefits come from software applications that rely on broadband or benefit from the increased speed, rather than the broadband itself. Broadband adoption is a frequently-used proxy for firm willingness to invest in new technologies, though its value as a proxy is declining as broadband becomes widespread.

Frey and Osborne conclude:

Our findings ... imply that as technology races ahead, low-skill workers will be reallocated to tasks that are non-susceptible to computerisation – *i.e.*, tasks requiring creative and social intelligence. For workers to win the race, however, they will have to acquire creative and social skills. (2013, p. 45)

The Commission has not further investigated these emerging developments. However, it believes they should be factored into the design of future policies.

Reducing adjustment costs and building human capital

Responding to the ICT revolution presents two particular challenges:

- how to raise the levels of relevant skills and experience; and
- how to reduce adjustment costs for firms and employees.

These two challenges may be best dealt with together. There are direct links between skills, training and adjustment costs. First, employees with higher skills and more experience are more likely to have easy transitions within and between employers. Secondly, firms with higher-skilled and multi-skilled employees are more likely to be able to fill gaps internally, lowering recruitment and redundancy costs.

Increasing skills and training

Retraining is one option for workers whose skills have become redundant because of disruptive technological change.

Governments generally fund a substantial proportion of training and education in general skills for workers. This includes initial education and training up to advanced tertiary qualifications and opportunities for retraining and lifelong learning. It also includes support for credentialing⁷⁷, employment-based training and maintaining a training infrastructure for sub-degree level training.

New Zealand has had comparatively very high rates of adult students participating in tertiary education over the last 20 years. More recently the proportion of older tertiary students has been falling as policy has shifted to encouraging greater participation by young adults in tertiary education.

It is more costly for older workers to take time out from work to retrain. First, if they are in work, the earnings they forgo while retraining are higher than they would have been at a younger age. Second, they have fewer years to recover the costs of their training through higher labour market earnings. Yet the social costs of not retraining in a rapidly and radically changing market for skills can be high (Bartelsman, 2013). This suggests that governments will need to play a more active role than at present in supporting worker retraining as a means to reduce the social costs of dislocation.

Chapter 10 discusses the tertiary education system as a supplier of ICT skills, emphasising the need for the system to be more responsive to demand. Improved responsiveness will be valuable in the education system more generally. In particular, demand is likely to be strong for lifelong learning and periodic retraining. At the same time the tertiary education system is likely to undergo radical changes as a result of fundamental shifts in the skills demanded, changes in the types of technology that are used by educators and increasing expectations that learning will match employer requirements (McKinsey, 2012).

Reducing adjustment costs for employees and firms

Employees can be the beneficiaries from flexible labour markets. Such markets can make it easier for employees to move to higher-paying jobs, or ones with conditions better matched to their situation and

⁷⁷ The assessment of skills and the issuing of a credential to recognise those skills by a party other than the training provider.

ambitions. Conversely, employees with skills or jobs that have become redundant can experience painful financial and status loss and may be deserving of societal support through a safety net and/or retraining.

The New Zealand Council of Trade Unions submitted:

Job loss can lead to long term losses [in] income and employment. ... The income and employment losses represent productivity losses. The cost of job losses therefore has implications not only for those losing their jobs for a considerable length of time, but also for the economy as a whole. (sub. 205, pp. 9–10)

There is an absence of supportive mechanisms (income support and retraining) for worker transition from low productivity firms to high productivity firms. (sub. 113, p. 3)

Bartelsman (2013) argues that labour markets subject to disruptive change because of ICT may need new types of intermediaries who anticipate job losses and initiate retraining and other forms of support to help affected workers move to new jobs. Countries will get a better outcome from facilitating and supporting adjustment than resisting it.

Flexicurity (Box 8.9) is a set of labour market and social security institutions with some of the elements needed to ease the transition of workers into new jobs. The design of such systems is complex and involves trade-offs between worker protections and the employer's ability to adjust their workforce, fiscal affordability, support for workers through the process of change and incentives to retrain and find new employment.

Box 8.9 Danish flexicurity

Flexicurity labour markets are characterised by flexible hiring/firing rules, a generous social safety net, and active labour market policies (Andersen, 2012).

The idea that it is possible to have flexibility for employers and security for employees, without impairing labour market flexibility and social balances, has received substantial attention. For example, the European Commission has proposed that member countries should follow the flexicurity approach (Andersen, 2012).

Denmark is often referred to as an exemplar of flexicurity due to its unique combination of:

- *flexibility* – measured by a high level of job mobility
- *social security* – a generous system of social welfare and unemployment benefits
- *active labour market programmes* – attaching conditions to the claiming of unemployment and social benefits, and also including retraining programmes to enhance the chances of those without jobs finding a job (Madsen, 2002).

Andersen and Svarer (2007) argue that active labour market programmes is the most important feature of flexicurity.

While the Danish model may not be well-suited to New Zealand, policy makers should be open to learning from overseas practice. If the ICT revolution proves to be as disruptive as many commentators are predicting, new labour market institutions will need to be explored.

F8.11

New Zealand and other countries will need to make major modifications to labour market institutions should the labour market changes from the ICT revolution prove to be as disruptive as many commentators are predicting.

8.6 Summing up: preparing for a revolutionary future

ICT is revolutionising how services are being produced and introducing new services around the globe. Commercial relationships are being continually reconfigured as ICT creates new possibilities. How this will play out in the future is highly uncertain. What is certain is that these changes are placing a premium on flexibility for firms to marshal their resources in new ways and to choose a different mix.

Governments need to choose a coordinated set of policies and institutions that respond to and take advantage of the ICT revolution. Chapter 9 examines in more depth the factors, including policy frameworks, that affect the adoption of ICT by firms.

ICT is likely to have disruptive effects on the labour market as computerisation replaces tasks ranging from manual, through routine, to the non-routine. Laboriously acquired skills may quickly become redundant and career prospects disappear. Incremental changes to existing labour market and education and training institutions may not be enough, if these changes occur as fast as some commentators predict. Governments will need to be ready to make deeper and more thoroughgoing policy changes as the full effects of the ICT revolution unfolds.

9 ICT adoption by firms

Key points

- The great majority of productivity benefits from information and communications technology (ICT) for New Zealand will come from adopting and using ICT that is developed and produced overseas. New Zealand creates a very small portion of global ICT products.
- Changes over time in prices, quality, risks, adjustment costs and expected benefits drive the pattern of ICT adoption.
- Individual firms adopt technology when it is available and its anticipated benefits exceed expected costs. The best time to adopt technology will vary by technology and by firm.
- A significant proportion of the costs of adopting ICT are fixed; they vary little with a firm's size or its expected revenues. This favours adoption by larger firms. Larger firms are also favoured because they can access lower-cost capital. New Zealand has few large firms compared to other countries, implying later adoption by New Zealand firms, on average.
- The combination of New Zealand's small market scale and the fall in unit ICT costs with increased scale tends to delay ICT adoption.
- New Zealand firms appear to be adopting ICT in line with what would be expected given the private costs and benefits they face.
- Important factors that influence the optimum adoption time for firms include access to capital, information diffusion, and ICT technical and managerial skills.
- The Government should develop a framework of policies and institutions that facilitate flexible resource reallocation, adaptability and mitigation of the costs of transition to an ICT-enabled economy.

This chapter uses a cost-benefit approach to understand information and communications technology (ICT) adoption by New Zealand firms. There are two levels at which costs and benefits of options are weighed up and decisions taken to maximise net benefits:

- Private costs and benefits as perceived by firms. A firm's decision about whether or not to adopt ICT is made within its overall business operating environment. This environment includes the demands and capabilities of a firm's suppliers, competitive forces (from direct competitors and those offering close substitutes), customer preferences, available technology, as well as the framework of government regulation and policies. Sections 9.1 to 9.4 explore the factors that influence a firm's decisions.
- Social costs and benefits as perceived by policy makers. Governments have the opportunity to set the framework of institutions and policies within which firms operate. Design of this framework should encourage firms to adopt ICT in a way that is most likely to benefit wider society. Sections 9.4 and 9.5 explore the factors that policy makers need to take into account to achieve this.

Firms are best placed to evaluate the private costs and benefits of whether and when to adopt technology. Adoption is largely a market-driven process. In general, the privately optimal decisions of individual firms are also socially optimal if two conditions are met:

- spill-over effects are minor (ie, decisions do not significantly affect third parties); and
- the framework set by government is well designed and does not unduly distort private decisions.

9.1 New Zealand firms and ICT adoption

Why does technology adoption matter?

New technology and new ways of using existing technology drive economic growth. New technology can be used to produce existing goods and services more efficiently, and to produce valuable new goods and services. Chapter 8 describes how successive waves of general purpose technologies (GPTs) have produced huge rises in material living standards since the Industrial Revolution. ICT is a GPT that is now producing rapid, sustained and far-reaching change.

New Zealand firms are relatively slow to adopt ICT

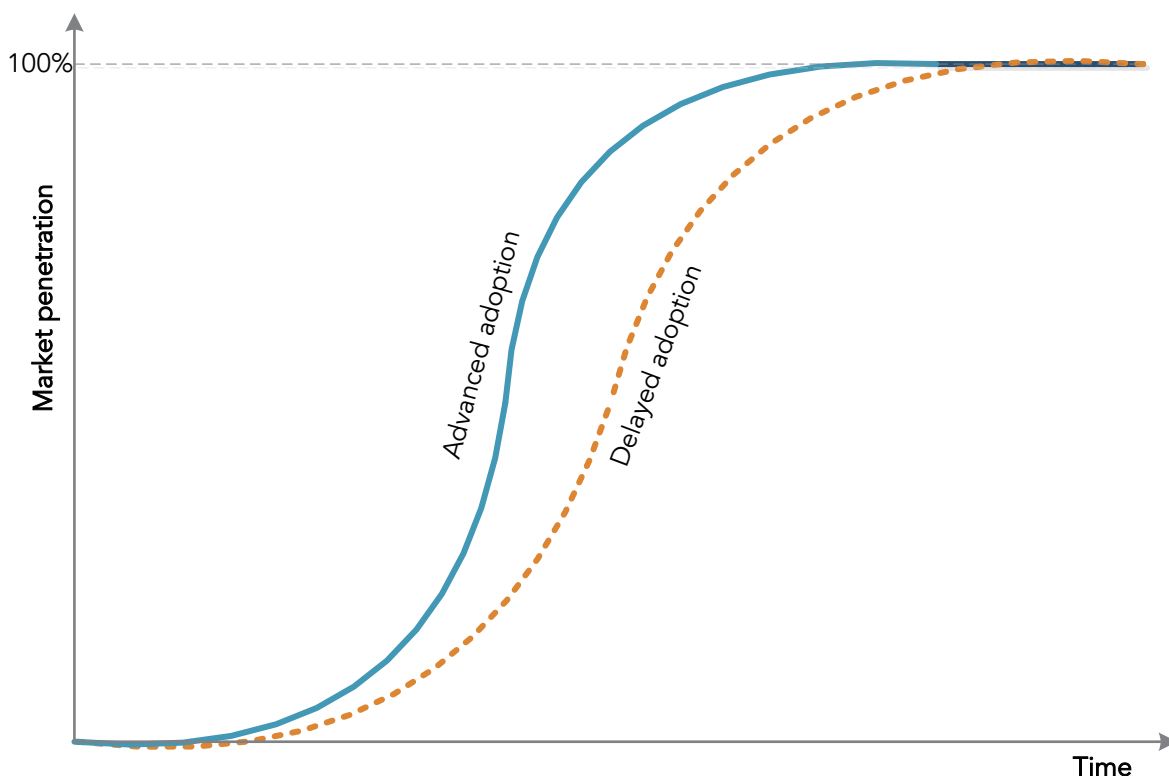
Most productivity benefits from ICT for New Zealand will come from adopting and using ICT developed and produced overseas. New Zealand creates a very small portion of global ICT products.

For New Zealand firms to successfully apply ICT requires at first that firms choose to adopt those technologies. ICT adoption is not an “all or nothing” choice – virtually all firms employ some ICT. It is useful to view adoption as a series of choices about whether and when to adopt (or skip) successive waves of technology.

New Zealand firms are, on average, relatively slow adopters of ICT. This can be inferred from comparative data on ICT investments per capita (Figure 8.3) and industry-by-industry comparisons between Australia and New Zealand in machinery and equipment (including computers) for each hour worked (Mason, 2013).

Figure 9.1 shows the typical diffusion of an innovation according to Rogers (2003). With successive groups of customers adopting the new technology, its market share (solid blue curve) will eventually reach saturation level.

Figure 9.1 The technology diffusion curve



Source: Rogers, 2003.

The curve follows an “S” shape – a low initial rate of adoption is replaced by relatively rapid adoption, which then slows as adoption nears 100%.⁷⁸ The dotted orange curve shows the likely adoption pattern in a country with conditions that encourage relatively later adoption.

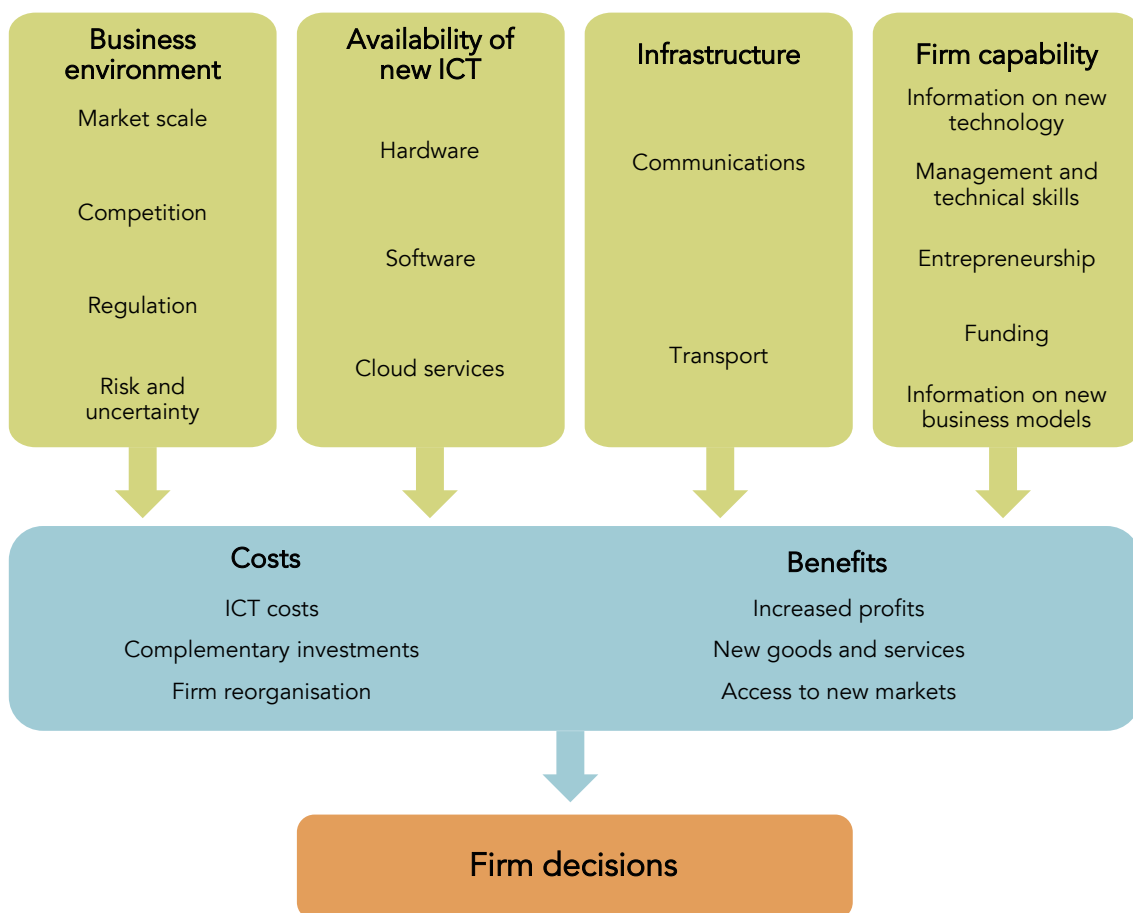
The adoption curve for ICT in New Zealand likely sits to the right of the average adoption curve for advanced economies.

Policy changes that reduce the influence of factors that delay adoption could generate positive net benefits. To be justified, such policy changes would need to incur fewer costs than the benefits they generate.

9.2 What affects a firm’s decisions to adopt ICT?

The factors that affect a firm’s decision to adopt ICT include the availability of ICT, perceived benefits and costs of adoption, the resources and capabilities available to the firm to realise the benefits, the business environment, and risk and uncertainty that influence decisions (Figure 9.2). Section 9.3 reports survey results on ICT adoption by New Zealand firms. Section 9.4 discusses in more detail the effect of selected factors on a firm’s ICT adoption decisions.

Figure 9.2 Influences on firm ICT adoption decisions



Availability of ICT

Before adoption can occur, ICT first needs to be available in New Zealand. The production and marketing of ICT is global. Software is typically released simultaneously worldwide.⁷⁹ ICT hardware is typically available in New Zealand within a few weeks of its initial release. New Zealand firms face no obvious barriers in licensing technology from overseas for use in New Zealand.

⁷⁸ Different theoretical models can each explain the S-curve that is found in empirical studies. Models include the epidemic model of information diffusion; legitimation and competition; information cascades; and the probit model (Geroski, 2000; Jensen, 1982).

⁷⁹ This is true for English language versions. Markets requiring translated versions often experience delays before those versions become available.

Benefits of adopting ICT

The main benefit to a firm that adopts ICT is an increased stream of future profits. ICT might enable the firm to produce the same goods and services at lower cost, produce valued new goods and services, expand into new markets and realise greater economies of scale.

Costs of adopting ICT

Costs of adoption for a firm include the costs of hardware and software, and of complementary investments and business reorganisation. Costs of software and hardware are typically a minority of total costs (Chapter 8). Costs also include the cost of gathering information and of obtaining funds, and of adjusting to changed labour requirements.

Firm capabilities

Firms' capabilities include entrepreneurial, management and technical skills. Entrepreneurs are the networkers who identify and champion business opportunities.

Management and technical skills are complementary inputs to ICT capital. Limits on those inputs will reduce the productivity benefits of investing in ICT. The supply and demand of ICT skills are discussed in detail in Chapter 10. Management skills are discussed in sections 9.4 and 9.5.

The business environment

The business environment, for instance the extent of competition and government regulation, influences the costs and benefits of adopting ICT. Other business environment factors include the quality of digital and physical infrastructure, and institutions that support collaboration among firms.

Increased competitive intensity stimulates innovation and increases economic efficiency in most markets (Chapter 5). Competition encourages firms to look at how to lower their costs and better match their products to their customers' needs. ICT offers the potential to do both.

Competition occurs in input as well as in product markets. For example, firms compete for skilled workers and higher-quality, lower-price materials.

Access to larger markets allows firms to grow to a larger size and intensifies competition, other things equal. Larger firms are able to spread the fixed costs of ICT and complementary investments over a larger revenue base, making it more likely that they will adopt ICT.

Regulation can increase the cost to firms of adjusting their business model to adopt new ICT, or even prevent adjustment. Labour market regulation, for instance, influences choices about adjusting the type and number of staff. Land-use regulation can affect the roll-out and availability of ICT infrastructure, or the siting of buildings to leverage investments in ICT.

Available infrastructure, often provided or funded by government, affects a firm's feasible choice of ICT and complementary investments.

Risks and uncertainty

Risks and uncertainty affect business decisions to adopt ICT. Firms weigh up the likely costs and benefits of adopting based on available information. Costs include the costs of taking any steps necessary to reduce the risk of losses. Technology prices and associated adoption costs typically fall with time, while benefits become more predictable. Firms will wait until expected benefits outweigh expected costs.

When firms are uncertain about the size of costs and benefits or their probability they may choose to wait until they have more information.

Early adopters are a special case. They face the risk of stranded or sub-optimal investment should a competing technology prove to be a better match for their needs or win out in the market. They may also face higher costs if adopting a very new technology. Early adopters trade off these higher risks and costs

against the prospect of early returns. In some markets, such as winner-takes-all markets, early adopters take on higher risks for the possibility of capturing medium-to-long term super profits (ie, rents).

Risk and uncertainty are inherent parts of business. Government actions can, however, amplify risk or increase uncertainty. Regulatory uncertainty arises for firms because it is unclear how governments will respond to future circumstances. Governments may create new (as yet unknown) regulation. Regulators might apply existing regulation in new ways. This uncertainty can have chilling effects on investment.

Government commitments not to change particular policy settings – at least not before a specified date or without a fixed notice period – can help, but only to the extent that the commitment is credible. Governments cannot bind future Parliaments.

Regulatory risks can also occur when it is difficult to predict how decision makers will react to specific proposals. The economics of a mobile network, for instance, will depend on whether and where towers can be sited. Uncertainty about regulatory decisions can undermine the business case for adopting ICT.

Firms may also be uncertain about other areas of government that affect decisions to adopt ICT; for example policies and decision making on infrastructure, taxes, subsidies and information dissemination.

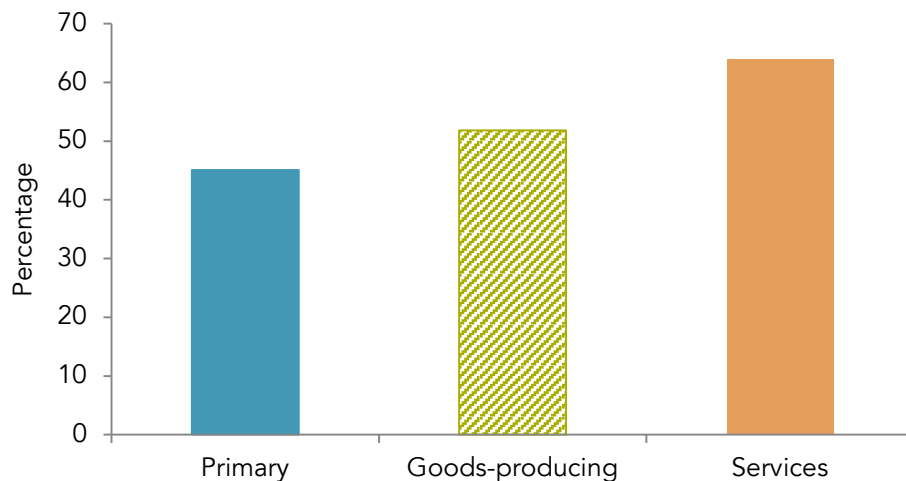
F9.1

A firm's perceptions of risk, cost and returns affect its decisions about adopting ICT. Those perceptions are influenced by government policies, regulation and actions affecting infrastructure, taxes, subsidies and information dissemination.

9.3 Business survey: New Zealand firms' investment in ICT

The Commission's 2013 business survey asked firms whether they had invested significantly in ICT during the past two years. More than 60% of firms in the services sector responded positively (Figure 9.3). This percentage was higher than positive responses from firms in the goods-producing or primary industries.

Figure 9.3 Percentage of firms that invested significantly in ICT during the last two years, 2013



Source: Productivity Commission; Colmar Brunton.

Notes:

1. Chart is based on the responses of 165 primary sector firms, 289 goods-producing sector firms and 1072 services sector firms.

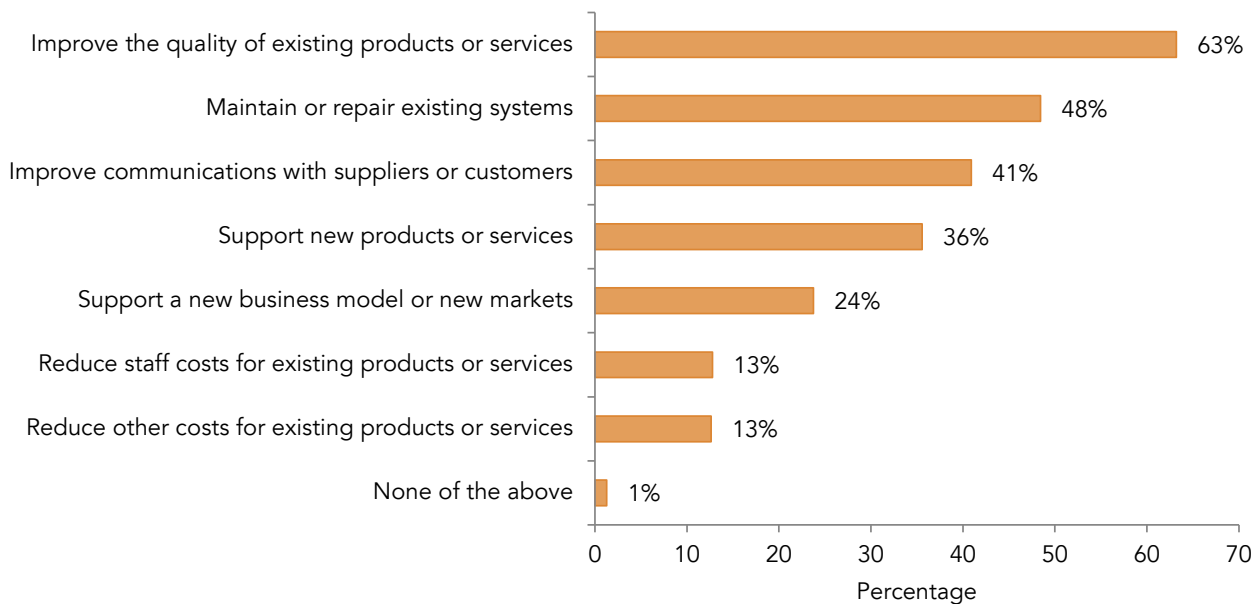
F9.2

Firms in the services sector are more likely to have invested significantly in ICT during the past two years than those in either the goods-producing or primary industries.

Why do service firms choose to invest in ICT?

The Commission's business survey asked service firms (that had invested significantly in ICT during the last two years) their rationale for investing (Figure 9.4).

Figure 9.4 Reasons why service firms invest in ICT, 2013



Source: Productivity Commission; Colmar Brunton.

Notes:

1. Respondents were able to cite multiple reasons for their decision to invest in ICT. The chart is based on 734 responses.

Reasons for investing in ICT most commonly relate to a need to improve the quality of existing products or services (63%) followed by the desire to maintain or repair existing systems (48%), improve communications with suppliers or customers (41%) and support new products or services (36%). Firms in the goods-producing and primary industries were less likely to have invested in ICT to improve the quality of existing products or support new products. The least common rationales focused on reducing cost.

The survey results indicate that New Zealand service businesses are investing in ICT to improve their services or support new activities, rather than to reduce the costs of existing activities.

This association between ICT investment and business improvement is consistent with overseas research on the links between ICT use, business transformation and productivity growth (Chapter 8).

F9.3

Firms in the services sector are investing in ICT to improve their services or support new activities. Reducing the cost of existing activities is the least common rationale for investing, according to survey responses.

Why do service firms choose not to invest?

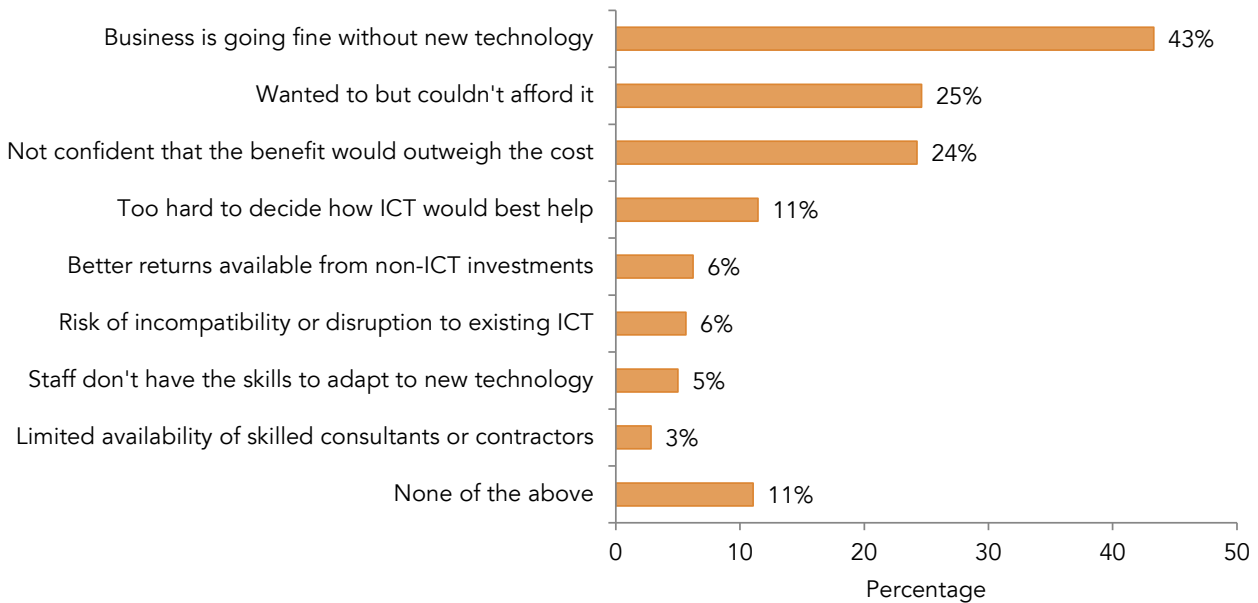
The Commission's business survey asked service firms that had not significantly invested in ICT in the last two years) their rationale for not investing (Figure 9.5).

The "business is going fine without new technology" response dominates (raised by 43% of firms that did not invest in ICT or about 14% of all participating service firms). The response was less common from firms based in Wellington and Christchurch, and more common in firms with five or fewer employees.

It would be cause for concern if this response reflects a large number of firms with no aspirations to expand or that face little competitive pressure. The response is, however, challenging to interpret. It could also cover cases where respondents are simply unaware of the possibilities of using ICT to improve their

business. Equally, it could cover businesses that invested significantly in ICT more than two years ago or where there are small benefits from investing in ICT. Without further information it is hard to read more into this result.

Figure 9.5 Reasons why service firms that did not invest in ICT chose not to do so, 2013



Source: Productivity Commission; Colmar Brunton.

Notes:

1. Respondents were able to cite multiple reasons for their decision not to invest in ICT. The chart is based on 338 responses.

The next most common responses suggest that the two factors most likely to discourage service firms from investing in ICT were the overall financial case (“not confident that the benefit would outweigh the costs”, “better returns available from non-ICT investments”) and limited capital (“wanted to but couldn’t afford it”). Limited information (“too hard to decide how ICT would best help”) and limited access to skills were relatively less common factors.

F9.4

The factors that discourage New Zealand service firms from investing in ICT include the overall financial case and limited capital, and, of lesser importance, limited information, and limited access to skills.

The reasons given by firms for not investing in ICT were similar across the goods-producing, primary and services sectors.

Do service firms make good decisions on ICT adoption?

Productivity differences between New Zealand and other countries might be explained if New Zealand firms made systematically poorer decisions about adopting ICT or had a higher rate of failure in implementation. The Commission is not aware of any cross-country studies that address this question.

The Commission’s 2013 business survey offers some insights on New Zealand business experience with significant ICT investments made in the preceding two years. 69% of ICT investments by service firms cost about the same as anticipated. While a larger number of services firm investments cost more, rather than less, than anticipated (22% vs. 4%), only 3% of services sector respondents reported that they did not expect the financial costs to be recovered over time. 94% reported that they expected their investments to deliver significant benefits to the business over time. These two results point to low levels of implementation failure or decisions that were subsequently regretted.

Some ICT investments are risky, so it would be surprising if every outcome was positive. While some degree of self-reporting bias cannot be ruled out, these high success levels perhaps point to low levels of risk-taking.

F9.5

The vast majority of New Zealand service firms expect their ICT investment decisions to recover their costs. This suggests a conservative approach to decision making.

9.4 Factors that could delay ICT adoption in New Zealand

The Commission's business survey responses indicate that the factors that discourage New Zealand service firms from investing in ICT include the overall financial case, limited capital, and, of lesser importance, limited information, and limited access to skills. This section examines evidence on specific issues that could play a part in delaying ICT adoption in New Zealand.

ICT prices in New Zealand

The markets for many – perhaps most – ICT products and services are global in nature. It is reasonable to expect that prices will be roughly equivalent across countries after accounting for taxes and transport (Chapter 8). Yet the House of Representatives Standing Committee on Infrastructure and Communications (2013) reported that prices of consumer IT products in Australia are 50–100% higher there than in comparable economies and that this cannot be fully explained by known factors that affect prices.

The Commission has not undertaken an independent review of ICT hardware and software prices in New Zealand relative to other countries. It is likely, however, that the Australian experience of higher prices also holds true in New Zealand. Prices for international software and hardware might even be a little higher in New Zealand than Australia. Suppliers could face increased costs because, for example, transport costs were higher, or the fixed costs of legal advice, localisation⁸⁰ or a local presence are spread over a smaller market.

Higher prices for ICT products would contribute to New Zealand firms delaying adopting ICT.

Business reorganisation and adjustment costs

Obtaining the full benefits from ICT requires complementary changes within – and across – businesses (Bloom, Sadun & van Reenen, 2012; Brynjolfsson, Hitt & Yang, 2002; Brynjolfsson & Hitt, 2000). Zand, van Beers and van Leeuwen (2011) found that “the productivity effect of IT significantly increases when technology investments are accompanied by relevant organisational changes. The observed complementarity effects between IT and [organisational change] are stronger for services than for manufacturing firms.” (p. 3)

Different forms of ICT can either reduce a firm's information acquisition costs (eg, enterprise resource planning software⁸¹) or reduce communication costs (eg, networks). Different forms of ICT therefore have different implications for within-firm organisational change. Bloom et al. (2009) find that reduced information costs favour increased decentralisation of decisions, while reduced communication costs favours increased centralisation. Both potentially change where decisions are made in the organisation, the rewards to specific skills in particular positions and labour requirements at different levels.

Some authors advocate “all or nothing” changes when introducing ICT (Box 9.1).

⁸⁰ Localisation costs are the costs incurred by software and digital content publishers in adapting their product to the requirements of a specific country's market and for checking and meeting legal requirements for sale in that country. They can range from very low (eg, a music download) to quite high (eg, Microsoft's support for te reo Māori in Windows 8, Office 2013, Outlook.com and Internet Explorer 10).

⁸¹ Enterprise resource planning is business management software that integrates and uses data from a range of business processes to support decision making. For example, in retail it could include merchandise orders, people and financial management systems, and sales and inventory management.

Box 9.1 All or nothing organisational change

A reason why businesses often earn disappointing results from investing in technology is because those businesses use technology to improve/speed up old practices instead of creating new practices (Hammer, 1990). Investing in IT without changing existing organisational practices can lower productivity (Brynjolfsson & Hitt, 2000). The need for “all or nothing” organisational changes to achieve the potential results from IT led to the phrase “don’t automate, obliterate” (Hammer, 1990).

Many businesses have improved their performance from investing in ICT and significantly overhauling out-of-date business practices; for example:

- Ford Motor Company planned in the 1980s to reduce the number of people in its accounts payable department (500) by 20%. Observing that Mazda employed only five people in this department, Ford decided a 20% reduction was not ambitious enough. Ford completely restructured the accounts payable process and fully automated most of the process. The end result was a 75% reduction in that department’s staff. By using technology to dramatically change their old practices, Ford exceeded their initial goal, reduced financial discrepancies and increased the quality of reporting. (Hammer, 1990)
- Air New Zealand overhauled its business model in the early 2000s. A major change was to improve online sales and total sales. The airline redesigned its website and simplified the process for making online bookings, reducing the number of steps from ten to five. Within 12 months of introducing the new website, the online sales volume had increased from less than 4% of total domestic bookings to 44% (iStart, 2004). Total sales jumped 23% in one year.
 - To manage the increased passenger volumes, Air New Zealand introduced self-check-in kiosks at major domestic airports. This enabled increased numbers of passengers to be processed without additional check-in staff. Check-in times dropped to 90 seconds for passengers with luggage to check-in (Air New Zealand, 2003). International evidence suggests that self-check-in processes cost as little as 14 cents per passenger, compared to more than \$3 for a passenger who checks in using the traditional approach (Kasavana, 2010).
 - In 2010, Air New Zealand set up kiosks at Auckland Airport which allow passengers travelling to Australia to scan their passports at a kiosk, print bag tags, drop their luggage onto a conveyor belt, and get their boarding pass. Air New Zealand reports that more than 70% of passengers travelling to Australia use the kiosks (Auckland Airport, 2010).

These two examples share a significant improvement in firm productivity as a result of investing in ICT and organisational change. The businesses drastically restructured their labour force, work practices and processes. This highlights the need for an environment that encourages this type of change, particularly given the disruptive nature of ICT.

To realise the full benefits of ICT, a firm may need to change its business model rather than simply automate aspects of its existing business model. Adjustment costs can be a significant barrier to changing a firm’s business model.

Lowering the adjustment costs that firms face can be expected to increase the adoption of ICT. A firm’s size and its prior investments in human and physical capital affect its adjustment costs (Tambe & Hitt, 2011). Larger firms can face higher adjustment costs because existing work processes and know-how (for instance those associated with customised software) tend to be tailored to the firm’s specific circumstances (Ito, 1996). Smaller firms are more likely to use common standardised applications that are easier to replace. In the longer run, though, larger firms do invest in organisational change and achieve higher returns than other firms (Tambe & Hitt, 2011).

Responses to the Commission's 2013 business survey reflected the higher adjustment costs faced by larger (and usually longer-established) firms.⁸² Larger firms (with 50+ employees) were more likely than were smaller firms (with less than 50 employees) – 21% vs. 6% – to note the “risk of incompatibility with, or disruption to, existing systems” as a reason for not investing in ICT.

F9.6

Larger and established service firms face higher adjustment costs than start-ups in adopting ICT, partly because of the risk of incompatibility with or disruption to existing systems.

Regulation can discourage ICT adoption by increasing adjustment costs. Regulation can also have an indirect effect on ICT adoption through restricting competition (Conway & Nicoletti, 2006).

Investment capital

Younger businesses tend to be more limited by a lack of capital than mature businesses with established cashflows (APC, 2007). For example, of the respondents to the Commission's 2013 business survey that did not invest significantly in ICT during the last two years, younger businesses were more likely to say they “wanted to, but couldn't afford it” (39% of businesses up to 2 years old vs. 21% of businesses more than 2 years old). This raises a question about whether start-ups and developing businesses face particular difficulties in getting the funds needed to invest in ICT.

The mostly intangible nature of ICT investment provides one possible reason. Software generally costs more than hardware and yet it has little if any value on the secondary market. So ICT capital counts for little in terms of collateral to support a firm's ability to borrow (Andrews & de Serres, 2012). This suggests that for firms significantly dependent on bank debt as a source of funding, and without the financial strength to borrow unsecured, investing in ICT may be harder than investing in more tangible forms of capital. This will be an issue mostly for small and medium enterprises (SMEs). Large corporations generally have a greater ability to borrow unsecured, including in the securities market, while the main form of financing for start-ups and emerging firms is equity.

New Zealand firms may also face particular difficulties in attracting venture capital. Matching investors to investments is hard in small markets as investors cannot afford to specialise. Yet New Zealand firms will find it hard to attract funds from other larger markets because it is difficult for venture capital investors to monitor and supervise investments at a distance (Sorenson & Stuart, 2001; Cumming & Dai, 2010). Section 9.5 discusses an option to increase venture capital in New Zealand.

Information for decision making

Collecting information to make decisions is costly. Firms may delay a decision on investing in technology and wait for more information if they are uncertain about prospective returns (Jensen, 1982). They may even decide that collecting further information is not worth the cost, given the likely returns. As a result, they may not invest in ICT, even if a fuller investigation would have found positive net benefits.

New Zealand firms face a disadvantage in keeping up with world best practice because of their physical distance from technology leaders in Europe, America and Asia. In a rapidly evolving area of technology, information on what works and how to make it work is often held by innovating businesses and not recorded. Such information is best communicated face-to-face and experientially. Distance makes this process more costly (Keller, 2004).

Multi-national firms could be an important route for technology diffusion in New Zealand. It is less costly for multi-national firms to pass tacit “in-house” information on new technology across borders than it is for the same information to pass between potentially competing firms, or from a vendor to a potential customer. Employees in multi-national firms can move easily and quickly (with their associated knowledge) to the location where their knowledge is most valuable.

⁸² Older firms in the Commission's 2013 business survey were also more likely than younger firms to cite “risk of incompatibility with, or disruption to, existing systems” as a reasons for not investing in ICT. However the sample size was too small for the differences to be statistically significant.

The economics literature on technology diffusion through multi-nationals is mixed about whether or not this is a route to raising productivity in host country firms. Effects depend on the industry and the purpose of the investment (Keller, 2004; Keller, 2009). Evidence from firm-level studies suggests that positive spillovers are much stronger in relatively high-technology industries.

The New Zealand evidence is limited. Fabling and Sanderson (2014) use firm-level data to look at the effect of foreign acquisition on the performance of New Zealand firms. They find that acquired firms are on average already better performing when acquired and afterwards grow faster, pay higher wages and produce more output than similar firms that remain in local ownership. Yet their productivity does not increase relative to the locally owned firms.

Service firms with some foreign ownership participating in the Commission's business survey were more likely to have invested in ICT, and more likely to have done so to support new products, a change in business model or entry into new markets.

Double taxation and restrictions on foreign ownership or international labour mobility affecting multi-national firms in New Zealand are likely to slow knowledge diffusion about ICT into New Zealand. The Productivity Commissions' trans-Tasman inquiry explored these issues in the context of New Zealand's relationship with Australia (APC & NZPC, 2012).

F9.7

It is less costly for multi-national enterprises, than for other firms, to pass tacit "in-house" information on new technology across borders. Multi-nationals may be an important route for technology diffusion into New Zealand.

Migration is an important source of knowledge about international best practice. New Zealand has high rates of emigration and immigration of skilled ICT workers (Chapter 10).

Westpac noted that ICT professional bodies have a role in disseminating information about the success and failure of ICT projects (sub. 219).

Entrepreneurship

Entrepreneurs perform an important role in the adoption of ICT. Entrepreneurs assess risks and rewards. One way that governments influence these risks and rewards is through bankruptcy law.

Every new venture carries substantial risk in a volatile business environment driven by fast-changing technology. There will be many failures for a smaller number of successes. Successful entrepreneurship requires a mix of skill, the right timing and good luck. As many entrepreneurial skills are best learnt on the job, one or two business failures are not unusual before the creation of a successful venture.

Well-designed bankruptcy regimes, by improving exit mechanisms for business, can promote the release of resources from inefficient firms, and encourage high-risk business start-ups and innovation (Jia, 2010; Andrews & de Serres, 2012). In contrast, severe legal penalties for bankruptcy make entrepreneurs less willing to leave paid employment to pursue innovative business ideas, and prevent entrepreneurs from re-engaging after a business failure (Armour & Cumming, 2006).

Bankruptcy law does not appear to be a barrier to private ICT adoption in New Zealand. International comparisons rate New Zealand's bankruptcy law as efficient and well-developed (World Bank, 2013). The cost imposed on entrepreneurs by bankruptcy law is very low in New Zealand, and the fear of business failure is not a common barrier to New Zealanders starting a business (de Serres, Yashiro & Boulhol, 2014; Global Entrepreneurship Monitor, 2005).

Aspects of New Zealand's "national culture" may not be conducive to entrepreneurship. Careful international comparative studies suggest that New Zealanders are relatively better at initiating innovative ideas than they are at successfully implementing them (Smale, 2009; Smale, 2013).

Such issues are complex and mostly not directly amenable to government policy. Instead, governments can best focus on creating a policy environment that is favourable to entrepreneurship (section 9.5).

Entrepreneurship and public ownership

Publicly owned enterprises tend to be slower to adopt new technologies (Rose & Joskow, 1990; Geroski, 2000). Possible reasons are that public ownership:

- makes it hard to raise new equity capital;
- discourages entrepreneurial risk-taking; and
- does not provide the strong and ongoing scrutiny and pressure for improvement that capital markets offer.

Partial private ownership can offset some of these reasons (NZPC, 2012a). When considering ownership models for particular enterprises, governments should consider the effects of public ownership on technology adoption.

Quality of firm management

Firms with high-quality management are more likely to adopt ICT effectively. This requires managers with a combination of skills:

- entrepreneurial skills – seeing opportunities to improve business performance and being willing to experiment;
- being “tech-savvy” – keeping current with ICT and its potential business applications;
- creating an environment in which staff can learn how to best use the new technology to improve business performance; and
- business reorganisation skills.

Researchers at the London School of Economics and Stanford University (Bloom & van Reenen, 2007) developed a set of survey instruments to measure the quality of management practices and their effects on firm productivity. Management practices are measured on three dimensions, covering how well firms:

- track what is going on inside their organisations;
- set targets, track outcomes and take action to correct problems; and
- promote and reward employees based on performance, and systematically try to hire and keep the best employees.

The surveys have been conducted across a wide range of countries in successive years from the mid-2000s. Twenty-nine percent of cross-country differences in productivity can be attributed to differences in management practices. Differences in management practices are also associated with wide within-industry productivity distributions in each country (Bloom, Sadun & van Reenen, 2013). The United States consistently rates highest on the measures of management quality.

Of particular relevance to ICT adoption, Bloom, Sadun and van Reenen (2012) show that US multi-nationals in Europe and the United Kingdom make more productive use of ICT than other multi-nationals in the same markets. This was accounted for by the people management practices in the US firms. Those practices involve closer attention to managing poor performance, to hiring and firing decisions, and to incentivising high performance. US multi-nationals are able to transfer some of their management practices across countries despite differences in labour market regulation. These practices complement investment in ICT:

IT-enabled improvements usually require more worker flexibility inside the firm, with workers taking on new roles ... when there is uncertainty over how best to use a new technology, giving more discretion to employees with higher-powered rewards may be a way to efficiently exploit their private knowledge. (Bloom, Sadun & van Reenen, 2012, p. 191)

Fabling and Grimes (2010) found that younger firms, large firms and high-tech firms in New Zealand were most likely to adopt high-performance human resource practices. Firms that adopted these practices

experienced a boost in their profitability, productivity and market share. Two practices were particularly important – performance pay for most or all employees, and firm-specific (innovation-related) employee training. The authors proposed that high-performance people management practices are particularly important in high-technology industries. These findings mirror the international research.

Management quality in New Zealand

Evidence on the quality of New Zealand's management practices is scant (Kidd, 2008). Most evidence is from small-sample, subjective evaluations of management quality.

The available data suggests that management quality in New Zealand is weak. For instance, in a detailed cross-country study of a small sample of manufacturing firms, management practices in New Zealand were ranked 10th out of the 14 OECD countries studied. People management was found to be particularly poor (Green et al., 2011).

If similarly poor people-management practices are prevalent in the services sector, then they would hinder the beneficial adoption of ICT by service firms.

There is also some evidence that New Zealand lacks a good cohort of ICT-savvy managers and directors (Chapter 10). Lack of technical knowledge among senior managers is likely to delay adoption of ICT (Boritz & Lim, 2007).

Section 9.5 discusses international evidence that teaching effective management practices improves firm performance.

The level of competitive pressure

Competition incentivises firms to innovate to escape the competition (Chapter 5).

Chapter 5 found that competition is less intense in services than other parts of the New Zealand economy and that competitive intensity is likely lower in New Zealand than in larger economies. As a result, New Zealand service firms have weaker incentives to use ICT to innovate than firms in other sectors of the New Zealand economy and service firms in larger economies.

Market and firm size

Large markets allow more scope for firms to take advantage of scale economies and grow. Because the New Zealand economy is small, firms here will remain small relative to those in larger economies, unless they move into exporting. Firms in the services sector are less likely to be involved in exporting than firms in other sectors.

Much of the cost of adopting ICT is fixed, with low marginal costs as the volume of business expands. In other words, overall cost does not vary much according to the size of the adopting firm or its anticipated revenues. For some ICT, such as enterprise resource planning systems, this makes adoption by larger firms with large volumes of business more cost-effective and profitable.

Moreover, complementary investments may exhibit economies of scale. For instance modern retail has invested heavily in ICT to streamline distribution chains, facilitate real-time tracking of inventories, and integrate pricing and advertising to improve responsiveness to customer demand (Appendix I). Large complementary investments have been made in new automated distribution centres and stores (McKinsey, 2002).

Larger firms are also favoured to the extent they are able to access lower-cost capital and diversify risk. A lower cost of capital reduces the economic cost of investing in ICT. Larger firms have lower risks as they are less likely to be in the position of "betting the farm" on the success of a single ICT project (Brealey, Myers & Allen, 2008).

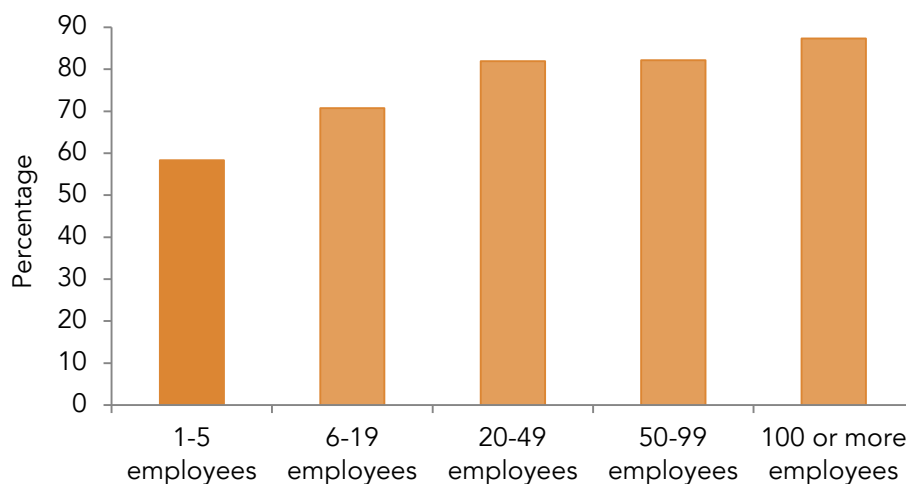
Because of these economies of scale, only larger retail operations in the United States (those with more than 100 employees) got significant productivity benefits from investing in ICT over the period 1992 to

1997 (Doms, Jarmin & Klimek, 2004). Tambe and Hitt (2011) found that “IT returns are substantially lower in small and mid-size firms than in Fortune 500 firms” (p. 1).

While economies of scale advantage large firms, small firms – and more particularly small, young firms – have some offsetting advantages of their own. Small firms can be more agile as they are less constrained by existing customers and relationships. And they typically have fewer assets that might be stranded by business model changes – reducing the costs of business reorganisation. At least in some markets small young firms are at the leading edge of technology development.

The Commission’s 2013 business survey asked New Zealand firms whether they had invested significantly in ICT during the last two years. The percentage of service firms that invested rose significantly with the number of employees (Figure 9.6).

Figure 9.6 Service firms investing significantly in ICT during the last two years (by firm size), 2013



Source: Productivity Commission; Colmar Brunton.

Notes:

1. Based on the responses of 1 072 service firms. The sample size for each bar ranges from 424 (1-5 employees) to 52 (100 or more employees).

New Zealand has proportionately fewer very large firms compared to larger economies, implying that New Zealand firms, on average, will rationally adopt new technology later in that technology’s lifecycle – all else being equal.

Economic integration and effective market size

Economic integration, such as that provided by Closer Economic Relations (CER) with Australia, offers firms the opportunity to operate at larger scale and serve larger markets. This increases the potential returns from investing in ICT. Reducing barriers to trade more broadly, for instance through free trade agreements, has similar effects. Effective market size can also be increased by reducing the segmentation of input and product markets (eg, by adopting prevailing international standards rather than domestic ones).

Infrastructure

Some ICT requires shared infrastructure, for example mobile phone networks and undersea cables. The nature of such infrastructure limits the number of providers to one or, at most, a few. Providers of this infrastructure are typically regulated to constrain market power; for example, restricting the ability of monopolists to prevent competitors from accessing essential pieces of infrastructure.

Competition in infrastructure and technology is a dynamic process, and undue downwards pressure by regulators on the price charged for current infrastructure can reduce the incentives to invest in newer infrastructure and technologies, delaying their introduction.

In these markets the short-run interests of consumers (lower prices) may run counter to their long-run interests (companies investing to upgrade technology). The regulatory task is complex (Chapter 7), and probably best done at arm's length from government due to the need to make credible medium-term commitments.

Cloud computing platforms

The hosting of cloud computing platforms in or near New Zealand is an example of limited availability of infrastructure. Amazon Web Services only recently began providing services from Sydney. Its main competitors – Google App Engine and Microsoft Azure – are still hosted in South East Asia where the latency⁸³ involved in data transfers makes them unsuitable for many New Zealand applications. Cloud computing infrastructure is discussed in Chapter 11.

Domestic data-communications infrastructure

The Government's Ultra-Fast Broadband (UFB) initiative provides infrastructure subsidies to extend the country's fibre-optic network to hospitals, schools, businesses and residences. The Government is contributing \$1.35 billion to extend the network to 75% of New Zealanders by 2020. Ninety percent of businesses will be connected by 2015. UFB will enable download speeds of at least 100 Mbps (megabits per second) and upload speeds of at least 50 Mbps (MBIE, 2013c). The wide extension of UFB to households will enable a greater range of ICT applications to be used by businesses serving households.

Technology and technology preferences are fast evolving. Very-high-bit-rate Digital Subscriber Line (VDSL) – which works over the pre-existing copper network – provides speeds of up to 70/10Mbps (upload/download) (Telecom NZ, 2013).⁸⁴ 4G – otherwise known as Long Term Evolution (LTE) – currently provides up to 150/50Mbps on Vodafone's New Zealand mobile network (Vodafone, 2014). Future versions, termed "LTE Advanced" are designed for speeds up to 1024/500Mbps (Kottkamp, Roessler & Schlien, 2012).

Firms can choose network options that best suit their needs. Fibre-optic networks were present in the major cities before the UFB roll-out began. Cable networks in Wellington and Christchurch support 130/10Mbps. Businesses have the option to relocate to places with fast internet access – in the same way previous generations of businesses have chosen to locate near ports, railways and airports. Other businesses with high valuations on fast connections negotiated with network providers to have fibre-optic networks extended; for example, CityLink's extensions to the Wellington suburbs of Petone and Miramar (Howell, 2010).

These observations indicate that domestic data-communications infrastructure is not constraining New Zealand businesses from adopting ICT.

F9.8

The roll-out of fibre-optic networks, and advances in mobile and copper-based fixed-line technology mean that domestic data-communications infrastructure is not constraining New Zealand businesses from adopting ICT.

International connectivity

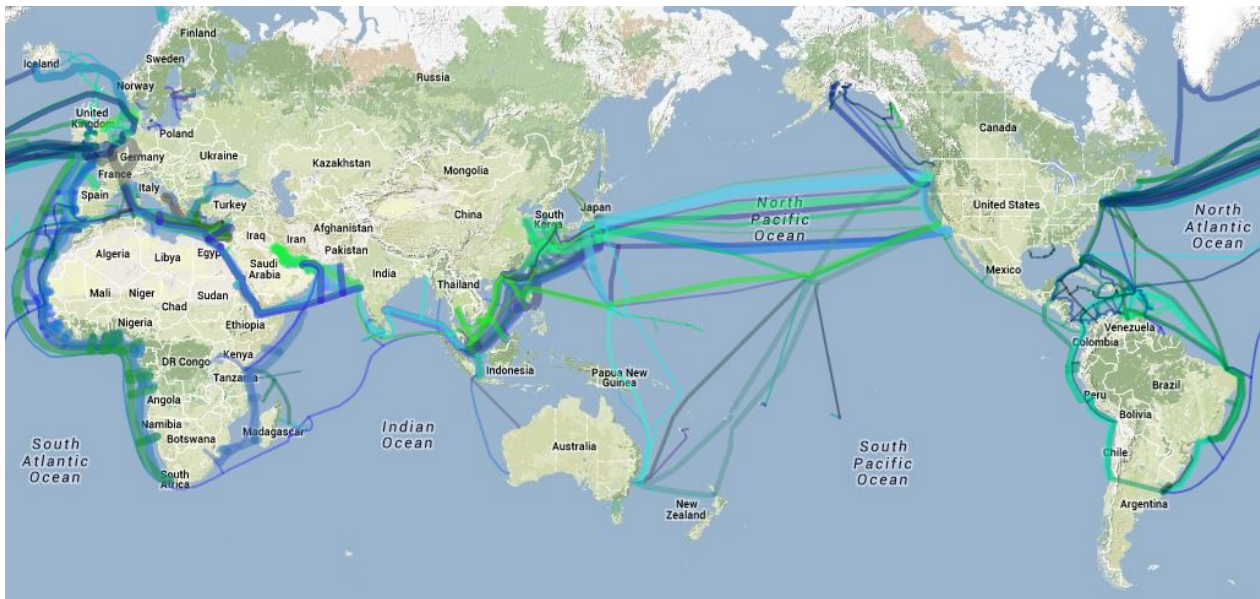
Reliable connectivity with the rest of the world increases the benefits of ICT adoption. New Zealand's location and relatively small population see it stand apart in the global data network (Figure 9.7).

New Zealand's three submarine fibre-optic cables come ashore near Auckland. This small number of cables – and having their landing zones clustered geographically – offers limited redundancy, and increases the risk that a natural disaster, accident, sabotage or equipment failure could seriously compromise New Zealand's data connectivity.

⁸³ Latency is the delay incurred in transporting data over a distance. Long latencies are perceived as slow speeds, yet latency is not directly related to the measures of bandwidth typically used as proxies for internet "speed".

⁸⁴ VDSL can vary widely depending on a property's location, the condition of its copper wiring and how busy the local copper network is at any given time of day and other factors. One benefit of optical fibre is that it reduces variability on some of these dimensions.

Figure 9.7 Undersea data cables



Source: Mahlkecht, 2013.

Notes:

1. Cables in service as at 19 December 2013.
2. The width of the cables reflects their relative design capacities. Cables less than 1Gbps are not shown.
3. Land-based cables are not shown.

The Tasman 2 cable links Auckland and Sydney. Commissioned in 1992, it is owned by Reach, a joint venture between Telstra and Hong Kong-based PCCW. Its data capacity is small by today's standards.

Two Southern Cross cables provide most of New Zealand's international data connectivity. One cable links Auckland to Sydney; the other links Auckland to California via Hawaii. Both cables are operated by Bermuda-based Southern Cross Cables Holdings Limited (SCCHL), which is owned by Telecom New Zealand (50.01%), SingTel (39.99%) and Verizon Business (10%). All three owners have an equal power to veto resolutions, giving Telecom New Zealand less control than indicated by their majority shareholding.

Commissioned in 2000, the two cables cost about US\$1.5 billion. Improved technology has seen their capacity progressively upgraded. Capacity is currently 2.7Tbps⁸⁵ – more than 10 times the original design capacity of 240Gbps. SCCHL expects to increase this capacity to more than 12Tbps, and expects that demand will continue to be lower than capacity for some years:

The chances are very high that the existing cable will continue to perform past 2025 until at least 2030 and the upgrade path for the cable means we will be able to outpace demand for many years (Southern Cross, 2012a).

Some commentators, users and potential users of the Southern Cross cables are concerned about their limited capacity and the market power of SCCHL to inflate prices (see Sunlight on international cables, 2011; Keall, 2013a; 2013b; 2degrees, sub. 217, p. 3).

SCCHL claims that its New Zealand market rates are identical to its Australian market rates:

We charge the same market rate for capacity from NZ to the US and for capacity to AU. We establish NZ market prices in the very competitive Australian and Hawaiian capacity markets and apply those prices to the NZ market. (Southern Cross, 2012a)

Claims about limited capacity and competition should become less relevant if one or more of the cables announced by several consortia goes ahead. For example:⁸⁶

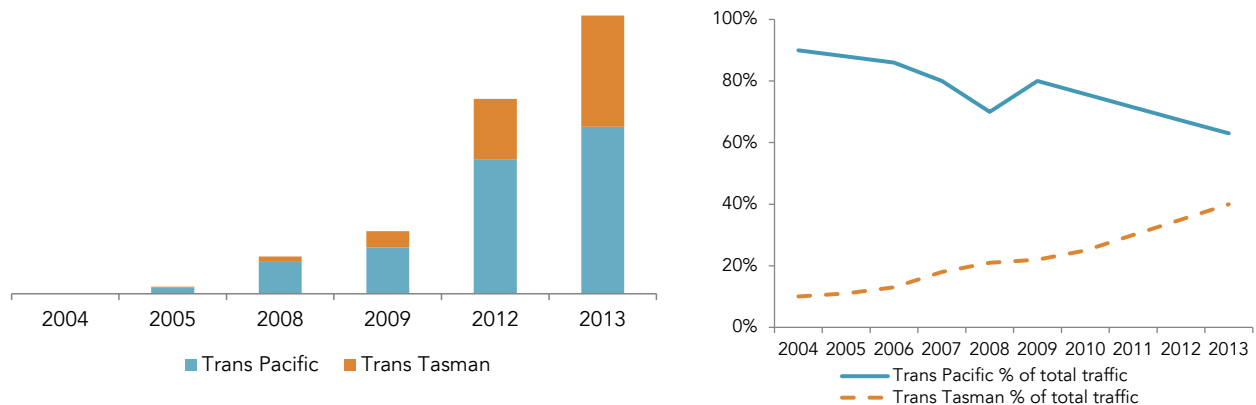
⁸⁵ "Tbps" is terabits per second or 1 024 gigabits per second (Gbps).

⁸⁶ 2degrees notes that "there are also market power concerns in relation to an undersea cable owned by a Telecom/Vodafone/Telstra consortium, with clear vertical and horizontal integration issues" (sub. 217, p. 3).

Telstra, Telecom and Vodafone have issued a tender for their proposed Tasman Global Access cable between Auckland and Sydney... The contract for the 2300km, \$US60 million cable is expected to be awarded by the end of the year... Construction should begin in 2014 and the cable [...] operational by 2015. (Keall, 2013c)

The proportion of New Zealand traffic going to or through Australia (as opposed to the United States) has been steadily increasing over the last decade (Figure 9.8). The trans-Pacific share of traffic has fallen from about 90% of the total in 2004 to about 60%. An extra link between New Zealand and Australia will provide further competition on this leg and into Asia;⁸⁷ and indirect competition for data traffic to the United States.⁸⁸

Figure 9.8 Telecom International cable data New Zealand traffic trends, 2004–2013



Source: Bennett, 2013.

Notes:

1. Left-hand chart estimates total data consumption in Mbps. The axis is not included because actual data use figures are commercially sensitive.

The proposed Tasman Global Access cable will also reduce risk through increased redundancy:

The ... cable will enable New Zealand to better leverage the four additional international cable systems serving Australia (with several more proposed or in development) and providing important redundancy (a second cable pathway) for New Zealand international traffic. (Vodafone, sub. 8, p. 6)

An additional trans-Tasman cable is a good match for New Zealand's medium-term requirements. A trans-Pacific cable dedicated to New Zealand traffic would be far more costly, and its economic case is less clear.

SubPartners recently announced the APX-East cable between Sydney and Los Angeles via Hawaii (SubPartners, 2013a). Construction is planned for 2014–2015. Its design includes a branch connection to New Zealand (SubPartners, 2013b). Hawaiki Cable Limited has a similar project underway and has signed letters of intent with several customers (Hawaiki Cable Limited, 2013). It is unclear whether these two proposals are fully funded.

Undersea cables are very expensive. Internet users or taxpayers will bear the costs of government intervention to increase the number of cables because of competition or redundancy concerns. The economic benefits of extra cables may not justify the costs.

The Commission does not believe that international data connectivity is limiting the adoption of ICT in New Zealand.

F9.9

The Commission has found no evidence that international data connectivity is limiting the adoption of ICT by New Zealand firms.

⁸⁷ Australia has four current cable connections with Asia, with a further two planned (Mahlknecht, 2013).

⁸⁸ It is a partial substitute, as routing New Zealand–US traffic through Australia increases latency and so offers a lower quality of service.

Main reasons that ICT adoption by New Zealand firms is delayed

Delayed adoption of ICT may be privately optimal for New Zealand firms, all other things being equal.

- Because of business and market-scale effects, New Zealand businesses may prefer to wait for a point on the technology diffusion curve where risks and costs are lower – but also where there is a lower expected return and a reduced ability to use the technology to differentiate and innovate.
- Lack of geographic scale and agglomeration in New Zealand reduces opportunities for productivity gains through the use of ICT in some industries (in particular wholesaling) compared, for example, to Australia and the United States.
- Relatively low labour costs make it profitable for New Zealand firms to use less capital-intensive business models, including those with less ICT capital. This should be seen as an effect as well as a cause – lower capital per worker reduces labour productivity and therefore wages. A challenge for New Zealand is to escape from this circle of causality. Policy changes that increase the returns from ICT capital could help.

F9.10

New Zealand firms are, on average, likely to delay adopting ICT compared to firms in larger developed economies, because of factors such as their relatively small domestic markets, distance to larger markets, smaller firm size and low labour costs.

9.5 Framework policies to facilitate ICT adoption by firms

This section takes the perspective of the Government acting as the agent of the people of New Zealand. It asks and attempts to answer the question: taking into account the way that firms make decisions about ICT adoption, what policy settings will create the best framework for firms and employees to work within as they make decisions to adapt to the ICT revolution (Chapter 8) and adopt ICT themselves?

Evidence for spill-overs from ICT adoption is weak

Positive spill-overs from a firm's decisions about adopting ICT could justify policies to increase the rate of ICT adoption (Box 9.2). Yet, while spill-overs are likely significant in specific cases, the economic evidence for general spill-overs from adopting ICT is weak (Draca, Sadun & van Reenen, 2006). Without positive spill-overs, there is little reason for governments to use subsidies to increase the rate of adoption of ICT by firms.

Box 9.2 Spill-over effects and ICT adoption

Some economic decisions create benefits or costs for others – beyond the people or firms who chose to partake. For example, bystanders may be harmed by cigarette smoke as a result of someone else's decision to smoke tobacco.

These effects are called "externalities" or "spill-over effects". Products with positive spill-over effects include education and vaccinations.

Individuals and organisations do not usually consider spill-over effects when deciding how much of a product to produce or purchase. Production and use of that product will be lower (for positive spill-overs) or higher (for negative spill-overs) than it would be had all the costs and benefits been taken into account.

An economy could improve its efficiency if the wider costs and benefits to society of spill-overs were recognised and acted on. Such improvements are conditional on the costs of recognition and action being lower than the benefits gained. If not, then society will be better off accepting the spill-overs and their consequences.

The types of positive spill-over effects that influence ICT adoption include network effects, knowledge

spill-overs and demonstration effects.

- *Network effects* occur when a product becomes more valuable to customers as a greater number of people use it. For example, video messaging applications such as Skype are only useful to a firm if its associates use the same technology.
- *Knowledge spill-overs* occur when investigations, research and learning about the effectiveness of a new ICT spread to other firms and individuals. The recipients gain from that knowledge without having to pay for its creation. This lowers their costs of adoption (Cooper et al., 2006).
- *Demonstration effects* are a subset of knowledge spill-overs. They occur when the visible success or failure from adopting ICT influences the adoption decisions of others.

Spill-over effects on ICT adoption can also be negative. For example, if most firms are using outdated technology, the desire to maintain compatibility may discourage individual organisations from upgrading (Shapiro & Varian, 1999).

The framework of government policy and ICT adoption

Many existing government policies and actions affect a firm's decisions about adopting ICT. Most of these policies are neither ICT nor services-sector specific. They are part of the overall framework set by many individual government decisions. More salient policy areas (identified in section 9.4) are:

- increasing effective market size through trade openness and further economic integration with other countries;
- regulating labour and capital markets and regulating land use, which can hinder the reallocation of economic resources to their most productive uses;
- funding and providing for education and training that builds human capital;
- facilitating the provision of infrastructure;
- increasing the intensity of competition (Chapters 5 to 7);
- supporting business capability development, including improving access to good quality information;
- supporting risk-taking and experimentation.

New Zealand has good policy settings relative to other countries in at least some of these areas (MED, New Zealand Treasury and Statistics New Zealand, 2011; de Serres, Yashiro & Boulhol, 2014). However, New Zealand faces challenges that many other countries do not, such as the economy's small size and remoteness. This means that it needs to have particularly good framework policies that address these challenges.

Reallocating economic resources to their most productive use

Large parts of the differences in aggregate productivity levels across countries, and variations in productivity growth rates, come from the reallocation of economic resources to more productive uses (Bartelsman, Haltiwanger & Scarpetta, 2012). This involves people moving to new positions and new types of work, capital flowing to new investments and, often, land being put to new uses. Regulation for other purposes can have the effect (perhaps unintended) of helping or hampering the movement of economic resources to more productive uses.

Labour market regulation

High-productivity firms tend to pay higher wages, and the resulting wage differentials can lead to efficiency gains through worker mobility:

Microeconomic data on individual firms and employer-employee matches reveal substantial and persistent dispersion in firm size, productivity, and average wage paid and a positive correlation between each pair. To the extent that intrinsic differences in firm productivity explain these facts, there are several important consequences. First, the reallocation of employment from less to more productive firms will yield efficiency gains. Second, workers will find it in their interest to seek out higher-paying employers. (Lentz & Mortenson, 2010, p. 577)

Lower adjustment costs speed the reallocation of employment to more productive uses. The potential loss of employees is a source of pressure on low-productivity firms to improve their productivity to support higher wages.

Labour market regulation is premised on correcting market failures in unregulated labour markets. These market failures include information and bargaining asymmetries, and encouraging employees and employers to make relationship-specific investments.

Labour market regulation that directly increases adjustment costs has been found to have a negative impact on technology adoption (Box 9.3), and specifically in the services sector.

Box 9.3 Research on labour market regulation and adjustment costs

A significant amount of overseas research has considered the effects of labour market regulation and adjustment costs.

Conti and Sulis (2010) found that labour market regulation that directly increases adjustment costs discourages technology adoption, and this impact is relatively stronger in sectors in which technology adoption is more important. These effects have become stronger since the 1990s and in those countries closer to the technological frontier.

Bartelsman, Gautier and de Wind (2010) report that stricter employment protection legislation (EPL) reduces the share of the highly innovative parts of the economy, disproportionately increasing employment in lower-risk industries.

Poschke (2009) found that stricter EPL has stronger negative effects in the IT-using services sector than in the rest of the economy. This is because productivity is more variable among firms in this sector and stricter EPL hinders the growth of the more productive firms and the exit of less productive firms.

EPL has also been found to influence specialisation patterns:

...whereby countries with high EPL specialise in secure goods at the end of their product cycle while countries with low EPL specialise in more innovative goods. (Andrews & de Serres, 2012, p. 27)

Country specialisation based on labour market flexibility is also reported by Cuñat and Melitz (2012) and Samaniego (2006).

The New Zealand Council of Trade Unions (CTU) submitted evidence that more restrictive labour market regulation favours productive R&D within existing firms, particularly in innovation-intensive industries (sub. 205). In particular, Acharya, Baghai & Subramanian (2010) argue that labour market regulation that makes firing employees more difficult means that in-house researchers know they will not be punished for short-run failures. Such regulation then encourages more in-house research with uncertain pay-offs. The evidence shows that this, in turn, results in more patents and citations.

Yet most innovation in ICT does not involve patenting. Importantly, the disruptive environment shaped by the ICT revolution puts a premium on movement of resources across firms and innovation by start-ups.

F9.11

Restrictive employment protection legislation can make it hard for firms to adjust to new technology and thus reduces innovation. These effects are stronger in the more dynamic parts of the economy and in the services sector.

New Zealand labour market regulation is generally rated at the “flexible” end of the spectrum in international comparisons (OECD, 2013d). The ICT revolution is likely to place a premium on such flexibility into the future because flexibility will make it easier for the more innovative and productive firms to grow and the less productive to exit.

Open, flexible capital markets

The efficient movement of capital – so that it gets allocated to the most productive firms – is an essential part of realising productivity growth.

The availability of equity capital to start-ups and emerging firms has been a long-standing issue. In 2002 the Government established the New Zealand Venture Investment Fund (NZVIF), to play a co-financing role, alongside private capital, as a way to increase availability of equity capital for young and potentially high-growth companies. The Capital Markets Development Taskforce in 2009 judged there was a “lack [of] scale and capability at the commercialisation stage [of new ventures]”. It considered that “our angel market is working relatively well, and the model for developing our venture capital market is best practice” and that “the key challenge in private markets is to attract more risk capital and capability to help businesses grow” (Capital Markets Development Taskforce, 2009, p. 12).

Subsequent assessments of the angel investor,⁸⁹ venture capital and private equity segments of New Zealand’s capital markets have been mixed. For example, the New Zealand Private Equity and Venture Capital Association (NZVCA) in 2012 assessed the outlook for the New Zealand private equity and venture capital market as increasingly optimistic over the medium term. Institutional investor support for private equity investment in New Zealand had grown over the previous 10 years, and venture capital preference for investment had swung towards software and ICT companies (NZVCA, 2012a, pp. 12–13).

Yet NZVCA noted in 2012 that the level of institutional investor support for private equity and venture capital was still low compared to other countries (NZVCA, 2012a). Private equity managers have been more successful in raising capital than venture capital managers. NZVCA argued that current KiwiSaver settings caused KiwiSaver fund managers to avoid less liquid assets such as private equity (including venture capital). In particular, NZVCA pointed to the rule that requires KiwiSaver fund managers to give effect within 35 days to a member’s request to switch to another KiwiSaver fund manager.

Inquiry participants have told the Commission that the 35-day rule does not generally hinder KiwiSaver fund managers investing in private equity and venture capital. Large fund managers typically keep sufficient funds in cash to meet transfer requests. The 35-day rule could however prevent smaller fund managers from investing in private equity and venture capital. As KiwiSaver funds grow and funds consolidate, this issue is likely to diminish in significance.

The Commission was also told that, even if liquidity was not an issue, difficulties in valuing private equity investments within a 35-day period (such funds are often valued quarterly or less often) could be a barrier to effecting switches within current rules. Fair valuation is also an issue when KiwiSaver funds accept contributions to purchase units or funds the withdrawal of units.

High fees associated with private equity funds may also deter KiwiSaver fund managers who want to compete by keeping their management fees low (NZVCA, 2012b; Westpac, sub. 219). Westpac submitted that a KiwiSaver fund manager’s desire to hold a balanced portfolio could also be a barrier (Westpac, sub. 219). This would not be a significant issue if, as likely, private equity and venture capital were only a small proportion of portfolios.

Despite the issues identified above, some KiwiSaver funds already invest in illiquid assets. For example, Milford’s Active Growth KiwiSaver Fund aims to invest 6% of its funds directly in unlisted companies. Clearly current KiwiSaver rules do not prevent investments in private equity and venture capital funds, but they may make them less likely.

⁸⁹ Angel investors are high net-worth individuals who provide seed capital for start-up businesses, usually in exchange for equity. They also bring business skills, connections and other forms of assistance (Angel HQ, 2014).

KiwiSaver funds have grown to \$16.6 billion,⁹⁰ so they have the potential to make a significant contribution even with a small proportion devoted to early-stage equity markets. If KiwiSaver fund managers have greater flexibility in their investment strategies, this potential is more likely to be realised.

The main rationale for the members of KiwiSaver and similar funds being able to transfer from one fund to another is to maintain investor discipline over the institutions that manage their savings. (The case for reducing search and switching costs for funds is explored in Chapter 6.) Any changes to the 35-day rule would need to take this rationale into account.

On balance, the Commission believes that KiwiSaver rules should be amended to reduce barriers that might unnecessarily limit the investment options available to fund managers. Providers should give savers very clear up-front information about any restriction on switching or accessing funds. Changes to the 35-day rule should not apply to default funds, which should be conservative.

R9.1

The Ministry of Business, Innovation and Employment, when next reviewing the KiwiSaver Act 2006 or within three years, should consider options to make it easier for KiwiSaver providers to invest in private equity and venture capital.

Land-use regulation

Barriers to efficient reallocation include anything that could stop or delay the use of an asset for its new best purpose. For example, land-use restrictions could delay a firm moving to new, more suitable, premises. Restrictions that make conversion of a firm's current premises to alternative uses slow and expensive could devalue those premises, making it more profitable for the firm to stay.

International cross-country evidence shows that differences in land-use regulation can affect the benefits from ICT investments in the retail industry. This is because restrictive land-use regulation may prevent new stores and distribution centres being located in the right place and scale to get the best from the new technology (Appendix I).

The Resource Management Act 1991 (RMA) and relevant local government plans regulate land use in New Zealand. The RMA has been reviewed and amended almost every year over the last two decades. While anecdote abounds, there has been no systematic evaluation of the effects of the RMA on business investment decisions. Nor has a systematic cross-country comparison (that includes New Zealand) of the economic effects of land-use regulation been conducted.

Coordination of regulation that affects the adoption of ICT by firms

Regulatory barriers (such as those relating to data security and privacy, or affecting the provision and pricing of physical infrastructure) may hinder New Zealand adopting new ICT. Dealing with a broad range of ICT-related issues has become the normal business of government (Table 9.1).

Table 9.1 Some current and recent ICT-related regulatory issues

Issue	Laws and institutions (examples)
Access prices for copper broadband	Commerce Commission
Copyright infringement via digital downloads	Copyright (Infringing File Sharing) Regulations 2011; Copyright Tribunal
Cyber bullying	Harmful Digital Communications Bill
Data interception by intelligence agencies	Telecommunications (Interception Capability and Security) Act 2013; Government Communications Security Bureau (GCSB)
Internet crime	New Zealand National Cyber Security Centre; GCSB; Convention on

⁹⁰ As at 30 June 2013.

Issue	Laws and institutions (examples)
	Cybercrime
Privacy	Privacy Amendment Act 2013; Privacy Commissioner
Software patents	Patents Act 2013
Spam	Unsolicited Electronic Messages Act 2007
Trans-Tasman roaming charges	Joint investigation by MBIE and Australia's Department of Broadband, Communications and the Digital Economy
Ultra-fast broadband roll-out	Crown Fibre Holdings

Source: Productivity Commission.

While the Commission could assess each of these issues – and others that affect the adoption of ICT by firms – it is more valuable to consider whether the correct institutions and incentives are in place for the Government to take a whole-of-economy perspective on each of them.⁹¹ It is important for good policy making that an integrated view of ICT policy is taken when regulatory issues that affect ICT adoption by firms are decided.

A significant amount of ICT-related regulation is designed to minimise harm. A typical government response to these issues is to allocate it to an agency with a harm-minimisation objective. A risk with a narrow “harm-minimisation” approach is that it fails to take a wider economic perspective and recognise harms elsewhere in the community/economy.

Substantial ICT knowledge and expertise sits in silos within government. There are specialist groups spread across government, each with perspectives on particular issues. Agencies with such groups include MBIE, the Treasury, the Department of Internal Affairs, the State Services Commission and the Ministry of Justice. This raises questions about coordination. Are the broader connections being made? Is draft regulation that potentially affects ICT adoption being closely examined for its economic impact?

The Commission has reviewed the official advice on a selection of recent ICT-related regulatory initiatives. Many fail to take into account wider economic impacts of proposed regulation and/or do not investigate interactions with other ICT-related regulation. For example, official advice on the Harmful Digital Communications Bill (Ministry of Justice, 2013a; 2013b) did not:

- quantify new compliance costs for internet service providers or any flow-on effects for ICT adoption;
- recognise that the Government had recently introduced a number of new obligations for telecommunications providers (eg, through the Telecommunications (Interception Capability and Security) Act 2013 or the Copyright (Infringing File Sharing) Amendment Act 2011); and
- consider risks arising from overlapping, cumulative regulation or opportunities for synergy.

Moreover, the Communications and Information Technology Policy Group within MBIE was not consulted as part of the Cabinet Paper or Regulatory Impact Assessment process.

Rapidly evolving ICT is at the centre of productivity growth in services, so it is important to have good capability in policy analysis in this area and to adequately resource it. This will enable full consideration of the impacts of regulation on ICT adoption and economic performance. Providing joined-up, well-informed advice on ICT-related issues is not an easy task, and may require changes to roles and responsibilities within government. The primary responsibility for promoting good policy advice rests with the central agencies – the Treasury, the State Services Commission and the Department of Prime Minister and Cabinet.

⁹¹ Some of these issues are discussed in Chapter 11 in the context of cloud computing.

R9.2

As a matter of promoting good policy advice, the Treasury, the State Services Commission and the Department of Prime Minister and Cabinet should ensure that the design of regulation that significantly affects the adoption of ICT by firms takes comprehensive account of costs and benefits.

Spill-over effects from government ICT purchases

Government agencies are significant users of ICT products and services, a direct employer of ICT-skilled workers and, more generally, a large customer in many local product markets. Government purchasing in New Zealand makes up almost 15% of GDP (Minister of Economic Development, 2013).

The Commission has considered the view that government agents, when procuring ICT products, should take into account knowledge spill-overs. The arguments against accounting for knowledge spill-overs are strong.

First, the available evidence suggests that knowledge spill-overs from ICT adoption are weak (Draca, Sadun & van Reenen, 2006). Second, the value of knowledge spill-overs from ICT is, in any case, hard to quantify. Moreover, while the Government might appear to be a single buyer, its ICT needs are highly diverse. ICT decision making is devolved to agencies because they are better placed to understand their own needs than a central purchasing agent. Dispersed purchasing agents do not have the skills to quantify the value of knowledge spill-overs across the economy.

Third, knowledge spill-overs from Government ICT procurement are only likely to have value if the Government is at the leading edge of ICT adoption. On the contrary, the technologies that government agencies use are often older than those used in the private sector. For example, some agencies continued to use Windows XP long after it has been superseded by more recent versions and right up till security support was withdrawn by Microsoft.

NZRIse advocates making building local capability a factor in addition to knowledge spill-overs in government ICT procurement decisions:

As well as ensuring there is a knowledge transfer between providers and purchasers, the government's procurement decisions can have a wider impact on local capability. By acknowledging as part of the evaluation criteria the benefits of investing in local industries, the public sector can contribute to a vibrant and sustainable IT sector, one that is increasingly able to generate export dollars in the weightless economy...

This criteria [build capability locally] would be a macro-economic assessment of the costs and benefits to the taxpayer of each of the solutions. (NZRIse, 2012, p. 4)

The Commission believes that the Government should be neutral between international and domestic ICT providers in its procurement decisions.

Procurement agents dispersed through government agencies do not have the capacity to make macroeconomic assessments of their decisions any more than they have the capacity to evaluate knowledge spill-overs (MED, 2005).

New Zealand's international reciprocal free trade obligations in general do not allow discrimination in favour of local suppliers in government procurement. Nor do these obligations allow our trading partners to discriminate against New Zealand suppliers in their government procurement decisions. These reciprocal agreements provide opportunities for New Zealand firms in international markets that are likely to more than offset those that New Zealand firms may lose to international competition at home.

The Government is not yet an effective and informed purchaser of ICT (Ministerial Inquiry into the Novopay Project, 2013; Dunleavy et al., 2005; Small, 2013). The main focus of ICT procurement should be getting the best value for money over the lifecycle of the project. Failure to get the best value for money by not making good use of taxpayer funds has real economic costs. Improving the general quality of procurement should have more economic benefits than deliberate attempts to incorporate spill-over effects into individual procurement decisions.

Government can affect innovation in the service sector by not giving preferment, but by being a sophisticated, knowledgeable and demanding customer, as such demanding customers are a significant source of national economic advantage. (APC, 2007, p. 72)

The principles of treating all suppliers equally (whether international or local) and obtaining best value for money are contained in the updated government procurement rules issued in April 2013 (MBIE, 2013d).

Policies to raise firm capability

A firm's adoption of ICT is influenced by that firm's capabilities, the information available and its willingness to innovate. Capability includes entrepreneurial, management and other skills. Information includes information about technology, business practices and market conditions. Innovation includes developing new products and services, changing business processes and organisation and finding new markets. In well-functioning markets the best performing firms have the incentives to develop their capabilities and obtain the information needed for business decisions. Poor performers will drop out.

Because there is little evidence of spill-overs from ICT adoption, the rationale for government support in developing capabilities and providing information is weak. More generally, the evidence for spill-overs from innovation in services – learning from the experiments of other firms – is weak (APC, 2007).⁹²

New Zealand, like most countries, provides support for business development. Most of this support is delivered through New Zealand Trade and Enterprise (NZTE) and is targeted at exporting firms, particularly those judged to have the potential to grow (Box 9.4). The rationale for this support revolves around the challenges that firms face because of New Zealand's small domestic market and distance from major markets. Few businesses are of the scale to engage internationally. NZTE aims to replicate the benefits of a large firm, by developing connections and networks to overcome these disadvantages, providing market intelligence and helping exporting businesses build their capability. (NZTE, 2013a).

Box 9.4 New Zealand Trade and Enterprise's support for business

New Zealand Trade and Enterprise (NZTE) is the principal government agency administering support for business capability development. It works with a portfolio of about 4 000 New Zealand businesses that are committed to significant international growth.

NZTE engages more intensely with about 500 high-growth companies. These companies are selected according to their scale, attitude and ambition to succeed internationally, their potential impact on the wider economy and NZTE's ability to add value. They include a diverse mix of fast-growing SMEs and more established larger exporters. Export revenue for these companies grew by an average of 15.2% in 2012–2013. NZTE spent over \$130 million in 2013 providing internationalisation services.

NZTE spends around \$15 million a year on developing business capability (NZTE, 2013b). NZTE, alongside Callaghan Innovation, funds business capability building services to a wider range of New Zealand businesses through their Regional Partner Network. The network offers "capability vouchers" for eligible SMEs (with fewer than 50 full-time employees) that generally have a significant export orientation. About 2 500 businesses participated in the Regional Partner Business Programme in 2012–2013.

Capability vouchers are available to use as part payment (up to a maximum of \$5 000 for each business) towards the cost of capability development in business planning, business systems, business sustainability, capital raising, export, finance, governance, lean manufacturing/business operations, managing resources and marketing.

The programme is demand driven, but expenditure is controlled by eligibility targeting and a requirement for firms to engage with regional development agencies. Firms can select their own

⁹² Hausman and Rodrik (2003) use a stylised model and country case studies to argue for government encouragement of business investment in modernising industries in developing countries. In their model there are spill-overs from learning about what a country is good at producing and agglomeration economies from specialising in these areas.

training or capability development providers, which advertise through an online marketplace.

Source: NZTE, 2013b; 2014.

Improving firm management performance

In assessing the management practices of various countries, Bloom et al. (2007) find that countries with poor management scores have long tails of poorly performing firms. Even though their best firms perform well in international comparisons, the long tail of poor performers pulls their average scores down. For example, the best performing firms in India are better than average performing firms in the United States, but on average domestic firms in India perform well below domestic firms in the United States.

Better firm management performance is associated with more competitive product markets and a lack of regulatory distortions (Bloom, Sadun & van Reenen, 2013; Bartelsman, 2013). Competition causes managers to revise their perceptions of their performance, and winnows out companies with poor management practices (Coelho, Kao & Roland, 2013). Regulatory distortions reduce the benefits available from good management practices.

Bloom et al. (2013) show that effective management practices can be taught. They report an experiment in India, where randomly selected firms were provided with management practice consultants. After one year, these firms had expanded their operations and were 17% more productive than comparator firms without management consultants. The productivity gains were from improved quality and efficiency and reduced inventory.

Effective people management practices, in particular, enable firms to make more productive use of ICT (Bloom, Sadun & van Reenen, 2012; section 9.4).

F9.12

Training and advice in effective management practices make a significant difference to firm performance. Effective people management practices, in particular, enable firms to make more productive use of ICT.

Improving information flows

Government should share rather than own intellectual property

Ownership of intellectual property (IP) is an area where there is a particularly strong case to clarify procurement policy. Government agencies acquire rights to digital products such as software through many ICT procurement projects. Government procurement processes should purchase non-exclusive use rights in preference to IP ownership.

This stance offers direct benefits to government, as suppliers are likely to charge less for, and be willing to invest more resources in, a resalable product.

It is efficient to allow others to re-use IP as they do not then have to bear the cost of developing it for themselves. The supplier, rather than the purchasing agency, has stronger incentives to pursue the re-use of IP, as the supplier knows how it was developed and likely has a better understanding of how it can be applied.⁹³

In most cases, the cost to a government agency from not holding exclusive rights to IP is very low. There are very few circumstances where government agencies are mandated, resourced or motivated to make commercial use of IP. There are some rare situations, such as for national security agencies, where government ownership of IP might be desirable.

⁹³ An alternative approach would be for the Government to require that software IP be placed into the public domain or open-sourced. This approach has advantages and disadvantages, and these will vary according to the type of software and the presence of other products in the market. The Commission has not examined this further; however it notes that the recommended approach does not restrict the supplier from choosing to open-source the IP.

The stated purpose of the State Services Commission guidelines (SSC, 2008) is consistent with this perspective:

...only in limited circumstances should the government own and exploit the IP created under a contract. The default position is that the Supplier should own the new IP, with licences being granted to the Customer Agency and all other State Services agencies. (p. 3)

In contrast to this purpose, the SSC guidelines recommend that government procurement managers let suppliers own new IP only in a narrowly defined set of circumstances. Procurement managers are directed to consider security, the importance of the system, enforcement ability, private-sector applicability, open-source use and third-party commercialisation before pursuing supplier ownership. If any one of seven questions of procurement risk elicits a positive response, SSC guidance directs agencies to maintain IP ownership.

While the Commission does not have information on how these guidelines are applied in practice, they are confusing and could undermine the policy intention to make supplier ownership of IP the default position.

R9.3

The Government Chief Information Officer and the Department of Internal Affairs should review and update guidelines for treatment of intellectual property rights (IP) in government ICT procurement contracts. The default position, in practice as well as in principle, should be that the supplier owns the new IP, with licenses being granted to the customer agency and all other state sector agencies. This would encourage lower prices and productive re-use of that IP by suppliers.

Sharing Government's experiences of ICT

Demonstration effects occur when the visible success or failure of adopting ICT influences the adoption decisions of others. Demonstration effects are most relevant when other decision makers are considering adopting the specific technologies involved. Only if government agencies are relatively early adopters of new technologies will their projects have a valuable demonstration effect.

Demonstration effects potentially arise from government ICT procurement projects. The demonstration effects resulting from government policy on cloud computing are discussed in Chapter 11.

Public decision makers face strong incentives to suppress information about project failures. Yet success stories will not be credible unless Government is willing to communicate its failures.

Information about the technical success and failure of ICT projects will inevitably leak between agencies and firms as people move jobs. An alert news media, the Official Information Act, an active Parliamentary opposition and lobby groups are also factors that will likely expose failures of government ICT projects.

Central government agencies have a role in identifying the lessons from successes and failures and providing guidance to other agencies. Evaluation and review of ICT projects and publication of the results of the review, both within the government sector and more widely, would help. While MED (2011b) recommends review as a core part of procurement projects, publication for a wider audience is not mentioned.

The State Services Commission, as part of the Gateway process, directs agencies to review large, high-risk projects but rarely disseminates findings. Only two "lessons learned" reports have been published since 2008, and neither explored ICT-related issues in detail (SSC, 2014). Other major government ICT projects have been subject to one-off reviews as a result of failures (eg, the Novopay education payroll project). The *Government ICT strategy* sets out processes for re-organising capability; enhancing governance and decision making; and collaborating, communicating and engaging. The last process includes "reporting benefits and learnings". Yet this process does not specifically cover reviewing and evaluating ICT projects and disseminating information on their outcomes (DIA, 2013).

R9.4

The Treasury, the State Services Commission and the Department of Prime Minister and Cabinet, working together with the Government Chief Information Officer, should agree on and mandate a means to ensure that significant government ICT projects are evaluated and reviewed and the results disseminated both within government and more widely.

Sharing firms' experience of ICT

ICT-providing businesses have an interest in promoting ICT adoption among potential customers. A common approach is to give examples of how ICT has been used successfully in firms similar to the target audience. Likewise, because of the large sunk costs in its UFB infrastructure development the Government has an interest in promoting its use by firms (Minister of Communications and Information Technology, 2013). Firms are in the best position to judge what to make of this promotional material, and to gather more information to make those judgements.

Information about the success and failure of firms' ICT projects is likely to be spread through industry contacts and movement of personnel among firms. It is in the interest of the suppliers of ICT services to make the success of their ICT projects more widely known.⁹⁴

9.6 Summing up: taking advantage of the ICT revolution

New Zealand firms are slow adopters of ICT compared to other developed countries. This happens because of a combination of factors – particularly the small scale of the New Zealand economy, the lack of large firms and the distance to major markets. These are mostly factors that cannot be changed. What can be changed is the framework of policies that shape the environment in which New Zealand firms operate.

The speed and scope of the ICT revolution demands constant adjustment both by firms seeking a competitive advantage through using ICT and by declining firms that fail to compete successfully. This process involves major changes in business, employment, and skills; and extensive reallocation of resources from declining businesses to new and expanding businesses. Framework policies and institutions need to support and encourage flexibility, adaptability and experimentation.

Many of New Zealand's framework policies are rated as good or even superior in international comparisons. As new technology and new business models emerge, New Zealand will need to keep examining its framework policies to ensure that they are not posing unnecessary barriers to adjustment. No one change to policy is likely to make a big difference to the speed of ICT adoption but ongoing fine-tuning can make a cumulative and significant difference.

⁹⁴ For instance, there are case studies on the iStart and Crown Fibre Holdings websites (iStart, 2014; Crown Fibre Holdings, 2014).

10 Supply and demand of IT skills

Key points

- Firms in IT-producing industries and industries that make intensive use of IT need skilled professionals and IT-savvy managers to realise the benefits of IT investments.
- There has been a worldwide long-term increase in the demand for IT professionals. As the cost of IT continues to fall and its use becomes more widespread, this demand is likely to continue.
- New Zealand firms compete in an international market for IT skills. Local firms rely heavily on immigrants to fill vacancies for IT skills. IT graduate salaries are high relative to most other fields of study.
- Closer links between IT departments in tertiary institutions and firms would help students to be more work-ready on graduation. Establishing stable collaborative arrangements takes time and other resources. Intermediaries can play a useful role in bridging the gap between education providers and businesses.
- Funding for tertiary education providers largely follows students' study choices. Better information for intending students on the employment and earnings outcomes of IT graduates from each tertiary education provider would therefore sharpen incentives for providers to collaborate with firms in designing and implementing programmes of learning.
- Small IT-producing and IT-using firms individually lack the resources to provide graduates with an induction programme to build business and entrepreneurial skills. They also find it difficult to collaborate among themselves and with universities and polytechnics to help students gain the technical skills and other skills needed to be ready for work when they graduate.
- Larger IT-producing and IT-using firms offer better salaries to graduates and often provide cadetships and induction programmes that help bridge the gap between study and work. Their support for collaborative arrangements with tertiary education providers helps provide a platform that smaller firms can use to offer placements for students.
- Government should work with industry groups and education providers to encourage the growth of intermediaries that can bridge the education-to-business gap and expand opportunities for IT students to gain workplace experience.

This chapter discusses the supply and demand of “professional IT skills” – the ability to develop, repair, create and use advanced IT tools (López-Bassols, 2002). These skills are generally acquired through degree-level or equivalent study.

The chapter looks at evidence of a chronic international shortage of IT skills and the effects this has on delaying IT investments in New Zealand. It then considers approaches to improving the supply of skills.

The Commission is aware of initiatives to encourage a wider range of secondary school students into information science before going on to tertiary study. These initiatives aim to make information science less “geeky” and more attractive as a career choice while, at the same time, increasing the academic rigor of how information science is taught at secondary school. While such initiatives are important, the Commission has chosen to focus on the interface between tertiary education and the labour market. Here policy adjustments have the potential to provide faster results in matching supply and demand.

Box 10.1 IT or ICT skills?

This chapter generally uses the term IT (information technology) skills rather than ICT skills unless the context or specific sources require otherwise. This is because the academic qualifications needed for both are taught in computer science, information science and information management courses. Official statistics on enrolments and graduations in these fields are captured under IT. In addition, research on IT skills often focuses on IT rather than ICT as a profession.

ICT refers to a group of rapidly evolving information and communication technologies based on the increasing capability and falling costs of ICT hardware (Chapter 8). IT and communications technology have converged to share information sciences as a common base for skills. Factors affecting demand for and supply of skills in the IT profession are likely to apply equally to similarly scarce and specialised skills required by the communications industries.

10.1 Skills shortages reduce investments in technology

Chapter 8 discusses the emergence of ICT as a revolutionary general purpose technology that is transforming the production of services. Rapid development of new forms of ICT makes the economic life of existing ICT short – meaning firms need to make frequent new investments to keep current.

Professor Stephen G. MacDonell of the University of Otago argues that the key challenge for using ICT in New Zealand “relates to the development and retention of human capital *with the appropriate skills, knowledge and experience*”. He submits that the organisational value in the information industries “resides extensively in the people who create and manage knowledge as much as in the knowledge itself” (sub. 106, p. 1).

Skills shortages can result in low investment in new IT and less productive use of existing IT. Acemoglu (1997) looked at how workers’ and firms’ expectations intersect. Firms will not invest in new technology if they expect workers with the required skills will not be available; workers will not train if they expect firms will not invest in the technology. As a result, a persistent shortage of skills can reduce how much a firm invests in technology. Nickell and Nicolitsas (2000) looked at the effects of skill shortages on firms’ fixed capital investments, in a sample of UK manufacturing firms. Consistent with the Acemoglu model, they found that a 10 percentage point increase in the number of firms reporting a lack of skilled labour in their industry led to a permanent 10% reduction in the investments made by firms in that industry. Forth and Mason (2006) investigated the effect of self-reported ICT skills shortages on firm performance. They found that ICT skills shortages reduced the adoption and intensity of use of ICT, which reduced sales.

With rapidly evolving technology, it will be harder for firms to find workers with the right skills (López-Bassols, 2002). Firms prefer qualified IT professionals with successful work experience because they have already shown that they can adapt their academic learning to business processes, learn proprietary systems and keep their skills current. For example, experienced software testers use more effective strategies than the standard approach taught to graduates, partly because they have learnt how the software will be used in business (Itkonen, Mantyla & Lassenius, 2013).

IT-savvy managers are at least as important as skilled technicians in using IT effectively. Managers need to recognise the potential for IT to re-engineer their business, and also identify the required complementary investments (eg, the costs of training and making changes in business organisation and processes). They have to map and implement a path for how change will occur, and manage the relationship between IT specialists and senior managers during that process.

US firms with senior managers with IT qualifications and experience are more likely to use well-developed IT governance mechanisms that lead to better financial performance (Boritz & Lim, 2007). So a current shortage in IT skills, by reducing the future pool of IT-savvy managers, could have longer-term effects on the financial performance of firms.

Workers will be less willing to specialise in particular skills if few firms use those skills. Firms will want to locate in markets where there is a good pool of the specialised workers they need. This is partly why firms that need specialised IT skills tend to co-locate. Co-locating creates a thicker market for skills, reducing the risk to workers and firms from employment and business shocks. The international market for more specialised IT skills also reduces the risks involved in New Zealanders investing in those skills, and in New Zealand-based firms finding those skills. Migrant flows thus play an important part in meeting New Zealand's demand for IT skills.

F10.1

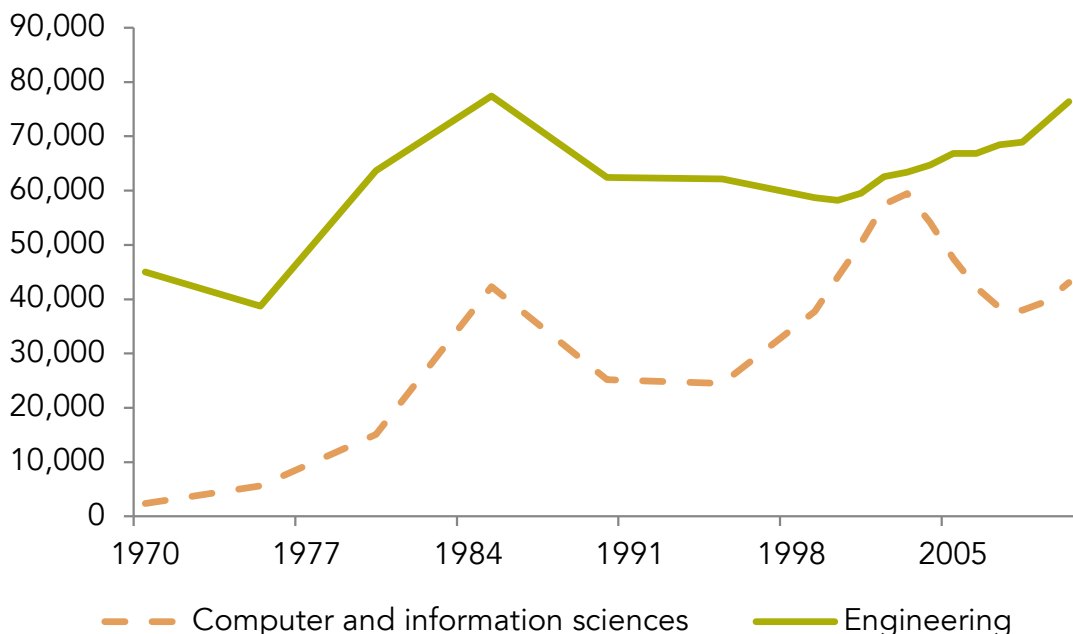
Firms will likely respond to chronic information technology (IT) skills shortages by reducing technology investments.

10.2 The long-term global rise in demand for IT skills

Persistent skills shortages have a stronger effect on investment decisions than cyclical fluctuations. The last 40 years has seen a sustained increase in underlying demand for IT skills. The falling price of IT hardware and the increasing use of IT in business and society have driven this demand (Chapter 8). IT and IT skills will continue to grow in importance for the economy (Bartelsman, 2013; Panko, 2008; Byrne, Oliner & Sichel, 2013). Examples are the recent rapid growth of online shopping (Appendix I), the development and uptake of new mobile applications, the adoption by governments of more sophisticated IT, the development of robotics and driverless vehicles and the exponential growth in data gathering, storage and analysis capabilities (Chapters 8 and 11).

US data on computer science degree completions since the early 1970s reflects the long-term rising demand for IT skills (Figure 10.1). Growth for the new discipline of computer science has been much faster than for the mature discipline of engineering. The supply of IT graduates has risen to match increasing demand.

Figure 10.1 Computer science and engineering degree completions in the United States, 1970–2010



Source: US Department of Education, National Center for Education Statistics.

Notes:

1. The data is for Bachelor degrees.
2. Engineering graduations are shown for a comparison of trends.

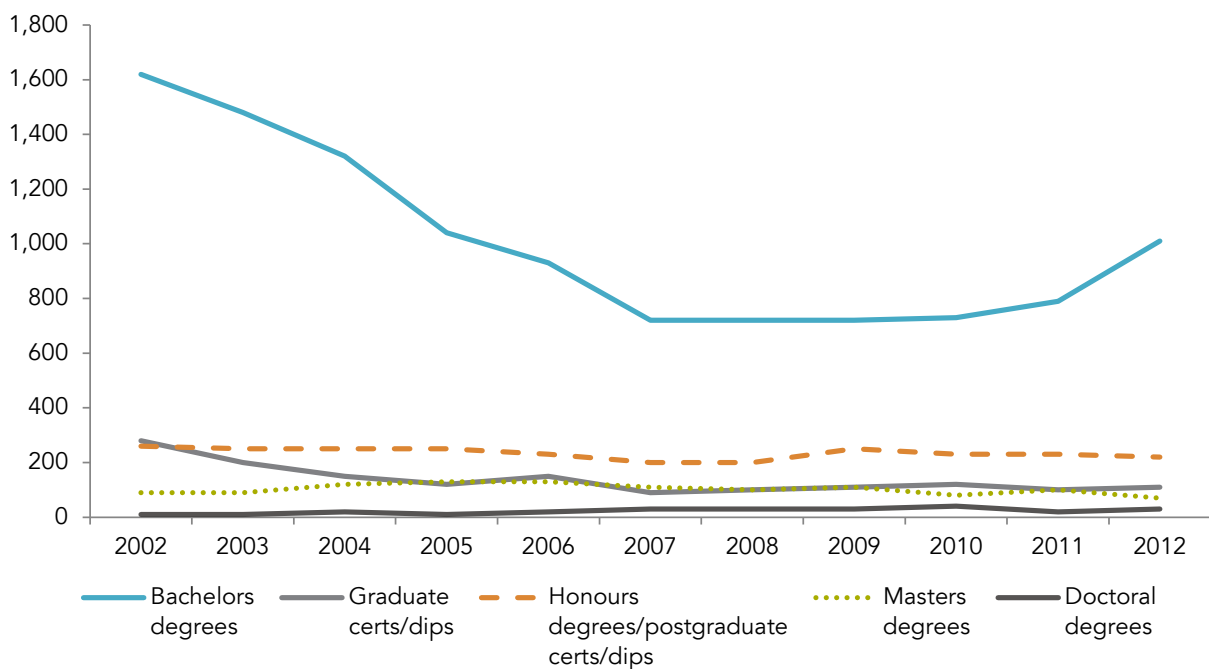
F10.2

The demand for IT professionals globally has been rising for four decades. Given the falling cost of ICT and its increasing use, this trend is likely to continue.

The dotcom bust and collapse in IT graduations

Like many new technologies with great potential for wealth, ICT production has experienced economic bubbles. In the mid-1980s and particularly the late 1990s, enthusiasm for careers in IT saw ever more students study IT and graduate with IT qualifications. A sudden loss of confidence in both periods caused a sharp decline in graduations. The most recent decline lasted from three years after the peak of the dotcom boom in 2000 until about 2008 in the United States and a little later in New Zealand.⁹⁵ Some countries saw enrolments and subsequent graduations fall steeply by between a third and a half from their peak (see Panko (2008) for the United States, HECSU (2007) for the United Kingdom, Nordicity & Ticoll (2012) for Canada, and Figure 10.2 for New Zealand).

Figure 10.2 Trends in IT degree completions by New Zealand domestic students, 2002–2012



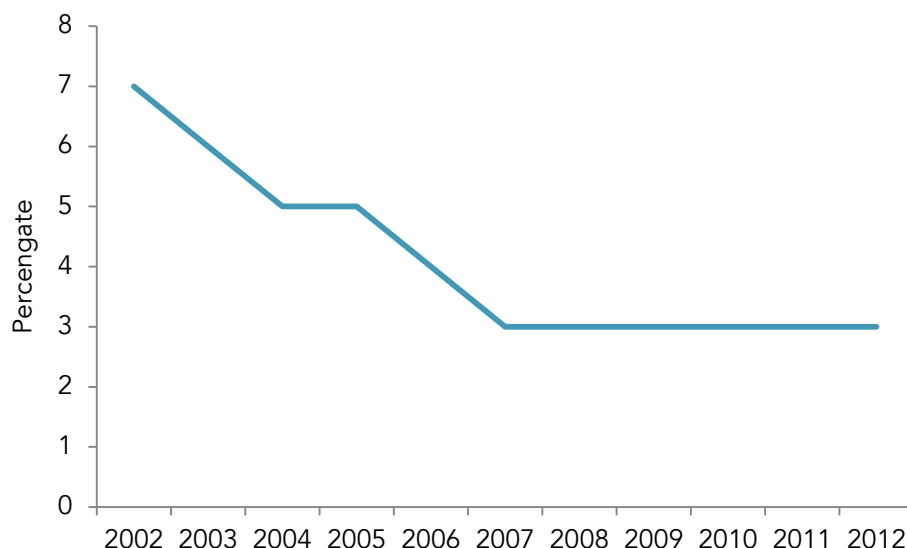
Source: Ministry of Education; Productivity Commission.

Notes:

1. Ministry of Education analysis of IT majors. Auckland University has supplied the Commission with data on qualification completions that show a considerably higher number of students taking majors and minors in computer science, systems and software engineering and related disciplines. At the peak, in 2002, over 1 200 students graduated from Auckland University alone with a major or minor in one of these disciplines. Numbers dropped to a low of 809 in 2010. Many other students would have included a substantial number of courses in computer science and related disciplines in their qualifications.

While falling sharply in absolute terms, the number of domestic students graduating with an IT degree also fell sharply as a proportion of all degrees (Figure 10.3). IT departments in universities faced difficult choices to adjust staffing levels.

⁹⁵ A speculative rise in stock prices of internet-based companies drove the dotcom boom. Business models were based on rapid expansion to gain market share while not “turning a profit”. Changing economic conditions led to a rapid drop in stock prices from a peak in March 2000, with many companies going bust and others finding it very difficult to raise capital.

Figure 10.3 IT degrees completed by domestic students as a proportion of all degrees, 2002–2012

Source: Ministry of Education; Productivity Commission.

During the 2000s the number of IT jobs rose while the number of IT graduates fell

Sharply falling and then stagnant degree completions were accompanied by only a short pause in the long-term rise in IT jobs. Rising employment in IT-using industries absorbed many who lost work in the dotcom bust. This led to a boost in productivity growth in those industries (Tambe, 2012). Employment in IT jobs in New Zealand rose much faster than overall employment in the 10 years to 2013 (Table 10.1).

Table 10.1 Annual average growth in demand for ICT occupations in New Zealand, 2004–2013

Occupation	Qualification level	Average number of workers, 2013	Growth rate
ICT managers	Degree or higher	6 309	5.9%
ICT trainers	Degree or higher	1 305	5.4%
ICT sales professionals	Degree or higher	996	-7.8%
Web designers	Degree or higher	756	4.4%
Electronic engineers	Degree or higher	928	-2.2%
ICT business & systems analysts	Degree or higher	9 659	4.9%
Multimedia specialists & web developers	Degree or higher	1 425	6.8%
Software & applications programmers	Degree or higher	17 432	5.7%
Database & systems admin & ICT security	Degree or higher	6 254	3.8%
Computer network professionals	Degree or higher	3 135	5.0%
ICT support & test engineers	Degree or higher	1 596	8.3%
Telecommunications engineers	Degree or higher	1 482	7.0%
Electronic engineering draftspersons & technicians	Diploma	2 367	-1.0%
ICT support technicians	Diploma	9 864	2.6%
Telecommunications technical specialists	Diploma	108	0.5%
Electronics trades workers	Level 4	1 862	0.0%

Occupation	Qualification level	Average number of workers, 2013	Growth rate
Telecommunications trades workers	Level 4	2 558	-0.5%
ICT sales assistants	Level 1	157	2.5%
Total ICT workers	-	68 193	3.7%
<i>Total workers – all industries</i>	-	<i>2 218 350</i>	<i>1.3%</i>

Source: Papadopolous, 2013.

Despite ongoing fast increases in employment, new enrolments stagnated during the mid-2000s because students lacked confidence in IT as a career (Panko, 2008). Tertiary education enrolments also tend to fall in a buoyant economy, as many countries experienced between 2000 and 2005. The start of the global financial crisis in 2008 saw a rise in tertiary enrolments. The follow-on effect was that the number of New Zealand IT graduates began to rise from 2011 (Figure 10.2). The growth in the number getting jobs in IT was filled partly by a continuing (though reduced) stream of new graduates and partly by inward migration of IT professionals. Victoria University of Wellington reports that enrolments in computer science now appear to have rebounded to levels prevailing during the dotcom boom.

F10.3

The dotcom bust in 2000 saw a rapid fall globally in the number of students graduating with IT qualifications. In the United States, the United Kingdom and New Zealand the number fell by between a third and a half over a 5-year period, reflecting a loss of confidence in IT as a career. Enrolments in IT began to rise only after a lag of seven years, despite continuing rapid growth in IT jobs.

New Zealand competes in an international market for IT skills

New Zealand employers compete in an international market for skills. Net migration of IT graduates is an important contributor to balancing supply and demand. Five years after graduation just over 30% of New Zealand IT graduates with a bachelor's degree have moved overseas (compared to around 28% for all graduates with bachelor degrees) (Smyth, 2013). In 2012, seven years after graduation, 36% of computer science graduates had been overseas for at least three years, compared to 23% of all graduates (Papadopolous, 2012). The buoyant international labour market for IT graduates is one reason they are less likely than other graduates to return to New Zealand.

The total number of work visas and skilled migrant visas approved each year for ICT jobs was equivalent to 8% of employment in these occupations overall and up to 84% in some very specialised occupations (Table 10.2).

Table 10.2 Work and residence visas approved in ICT occupations, 2008–2012

Occupation	On long-term essential skills list?	Ave. annual number of work visas approved	Ave. annual number of skilled migrant visas approved	Work visas approved as share of total workers	Skilled migrant visas approved as share of total workers
ICT managers	Yes	264	133	4.2%	2.1%
ICT trainers	No	28	7	2.1%	0.6%
ICT sales professionals	No	114	47	11.5%	4.7%
Web designers	Yes	36	13	4.8%	1.8%

Occupation	On long-term essential skills list?	Ave. annual number of work visas approved	Ave. annual number of skilled migrant visas approved	Work visas approved as share of total workers	Skilled migrant visas approved as share of total workers
Electronic engineers	No	48	34	5.1%	3.6%
ICT business & systems analysts	Yes	365	137	3.8%	1.4%
Multimedia specialists & web developers	Yes	317	46	22.2%	3.3%
Software & applications programmers	Yes	1 073	356	6.2%	2.0%
Database & systems admin & ICT security	Yes	163	80	2.6%	1.3%
Computer network professionals	Yes	207	91	6.6%	2.9%
ICT support & test engineers	Yes	290	104	18.2%	6.5%
Telecoms engineers	Yes	94	43	6.3%	2.9%
Electronic engineering draftspersons & technicians	No	57	40	2.4%	1.7%
ICT support technicians	Yes	586	390	5.9%	4.0%
Telecoms technical specialists	No	66	25	61.3%	23.4%
Electronics trades workers	No	67	43	3.6%	2.3%
Telecoms trades workers	No	147	99	5.7%	3.9%
ICT sales assistants	No	13	0	8.4%	0.1%
Total ICT workers	-	3 934	1 689	5.8%	2.5%
<i>Total workers – all industries</i>	-	<i>50 977</i>	<i>10 345</i>	<i>2.3%</i>	<i>0.5%</i>

Source: Papadopoulos, 2013.

Notes:

1. Skilled migrant visas are issued to people with the requisite skills and background who intend to become permanent residents. Work visas permit the holder to work in New Zealand and may also be a route to obtaining permanent residence.
2. These figures are derived by comparing work visas and skilled migrant visas issued for people in these occupations with average employment numbers employed in those occupations over four years. This is only a rough indication of how important migrants are to these occupations. Not all migrants issued with visas will enter jobs in their occupations. Migrants who take jobs stay in them for varying lengths of time. In addition, differences in how occupations are defined in visa and worker data may affect the accuracy of these figures.

In a 2009 survey of its members the NZICT Group⁹⁶ found that almost 30% of experienced staff recruited in the previous six months had been recruited from overseas, and more than 40% of firms had employed new or recent migrants (NZICT Group, 2009). In 2012, Xero hired 70 of its 200 new hires from overseas (Doesburg, 2013).

⁹⁶ Now the New Zealand Technology Industry Association.

F10.4

Flows of IT professionals in and out of New Zealand are strong. New Zealand is highly reliant on immigration to fill IT professional vacancies – especially in some specialist areas. Migration flows cushion the impact of domestic supply fluctuations in the market for IT skills.

The immigration system, while meeting other objectives, needs to facilitate the rapid and smooth transfer of IT professionals to fill New Zealand vacancies to mitigate the effects of skills shortages. New Zealand's immigration policy and practice makes it easy for skilled migrant IT workers to fill IT vacancies (Table 10.2). Immigration policy provides several routes by which skilled IT migrants can gain work visas and eventually residence visas. Most professional ICT occupations appear on Immigration New Zealand's Long-Term Skills Shortages List (INZ, 2013). In addition, Immigration New Zealand identifies ICT as one of three recognised future growth areas for the purpose of prioritising applications for skilled migrant visas (INZ, 2014). Processing times for most work visas are less than 30 days (MBIE, 2013e). The Commission is not aware of any substantial complaint from employers about immigration policy and practice making it hard to recruit IT workers from overseas.

F10.5

New Zealand's immigration policies and practice present few barriers to professional ICT workers moving to New Zealand to take up relevant job offers. Once here, it is relatively easy for migrant professional workers to qualify for residence.

Taxation policy affects the temporary transfer of employees from overseas

Trans-Tasman flows of IT professionals are particularly important for matching supply and demand in the New Zealand market because visas are not required. Though the Commission does not have data on these flows, many firms transfer staff between Australia and New Zealand to deal with fluctuations in demand or to provide services to third parties. The Commission, in its trans-Tasman joint study with the Australian Productivity Commission, found that trans-Tasman double taxation arrangements posed a barrier to the efficient transfer of temporary staff between Australia and New Zealand. It recommended that "[t]axation of non-resident employees should be considered when the double taxation arrangements between Australia and New Zealand are next reviewed" (APC & NZPC, 2012, p. 142). The same barriers may apply to temporary staff being transferred to New Zealand from other countries as well as Australia.

The issue arises because, under domestic taxation laws, income derived by a non-resident from performing personal or professional services for or on behalf of a non-resident employer within New Zealand is exempt, provided the non-resident is present in New Zealand for less than 92 days in a tax year. If the non-resident is present for more than 92 days in a tax year (and there is no provision otherwise in a relevant double taxation agreement between his or her country of residence and New Zealand), then the non-resident becomes liable for tax on the entire amount earned while present in New Zealand. In addition, their employer must be registered as an employer with Inland Revenue and must deduct PAYE (pay as you earn) and file PAYE returns with Inland Revenue. A non-resident employer thus incurs substantial compliance costs as a result of the 92 day threshold being crossed. Employers then have a purely tax-driven incentive to move staff in and out of New Zealand to try to ensure they remain within the exemption period.

As the deductions are backdated the employer may also be liable for penalties for late payment if they have not lodged a bond with Inland Revenue. Moreover, the non-resident employer may have been withholding and paying PAYE tax in its country of residence over this period. Even though payments in both countries will be eventually reconciled and any double tax refunded, the requirement to withhold tax for the same period in both countries may pose cash flow problems for small businesses.

When New Zealand negotiates double tax agreements with other jurisdictions it typically negotiates an extension of the exemption period from 92 days to 183 days in a tax year. Yet double tax agreements are usually only renegotiated at intervals of 15 to 20 years or even longer. A unilateral change to New Zealand's domestic taxation law would achieve the same effect much more rapidly and much more comprehensively.

The Corporate Taxpayers Group (sub. 206) and the New Zealand Institute of Chartered Accountants (sub. 207) submitted that, among other changes, the threshold under which income derived by a non-resident from performing personal or professional services within New Zealand is exempt from New Zealand tax liability should be increased from 92 to 183 days. The Commission considers that extending the threshold in this way will reduce barriers to the temporary transfer of employees into New Zealand. There would be a fiscal cost that would need to be taken into account.

The Inland Revenue Department advised the Commission that the 183-day exemption under double taxation agreements only applies where the cost of the remuneration is not taken against New Zealand's tax base. The Commission considers that the same condition should apply to a unilateral extension of the non-resident employee income exemption from 92 days to 183 days.

R10.1

The Government should seek to amend the Income Tax Act 2007 to increase the threshold from 92 to 183 days in any 12 month period under which income derived by a non-resident from performing personal or professional services within New Zealand is exempt from New Zealand tax liability.

New Zealand firms pay close to international wages for starting IT workers

New Zealand firms have to pay close to international wages for entry-level workers in selected IT occupations. This may be due to a reliance on migration to fill positions. Yet the best-paid IT professionals in New Zealand are paid substantially less than their Australian counterparts (Table 10.3). This may partly reflect differences between New Zealand and Australia in the scope and responsibilities of high-end IT workers. These differences at the higher end of the market are also likely to apply between New Zealand and the United States, and New Zealand and Europe.

Table 10.3 IT wages in New Zealand and Australia, 2013

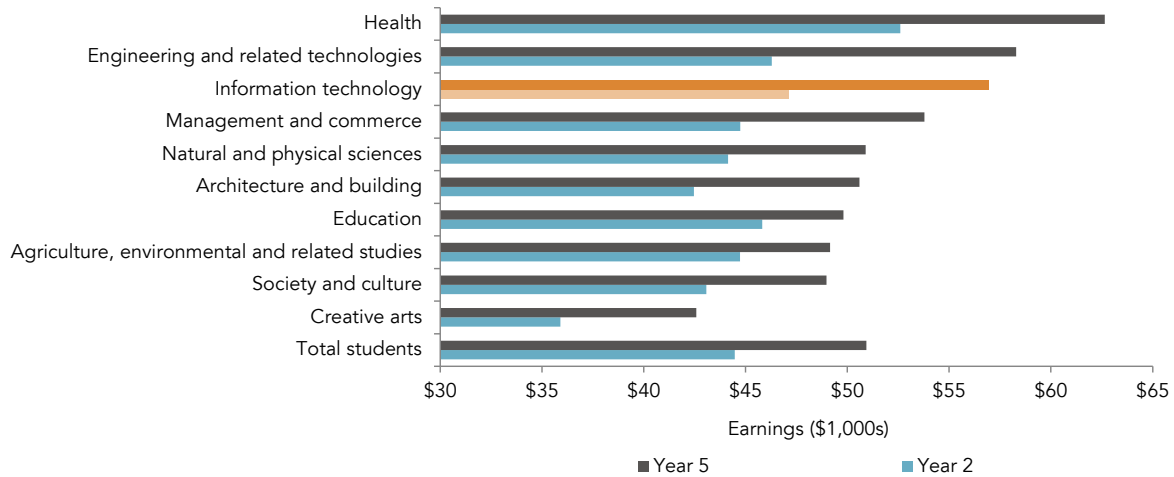
	New Zealand		Australia		% difference	
	\$NZ,000		\$NZ,000			
	Lower	Upper	Lower	Upper	Lower	Upper
Data warehouse developer	80	110	90	140	13%	27%
Senior analyst programmer	80	105	85	120	6%	14%
Chief information officer	150	200	150	365	0%	83%
Technical writer	55	80	65	100	18%	25%
Development manager	95	130	100	175	5%	35%

Source: Productivity Commission; Hudson, 2013.

Notes:

1. Australian salaries converted to New Zealand dollars using OECD purchasing power parity (PPP) exchange rates http://stats.oecd.org/Index.aspx?datasetcode=SNA_TABLE4
2. New Zealand data refers to wages in Auckland, Wellington and Christchurch. Australian data refers to wages in Sydney, Melbourne and Canberra.
3. % difference is Australia relative to New Zealand.

IT graduates earn good salaries in New Zealand relative to other graduates (Figure 10.4).

Figure 10.4 Median earnings of domestic bachelor's degree graduates 2 and 5 years after graduation

Source: Mahoney, Park & Smyth, 2013.

Notes:

1. The data is for earnings in the 2009/10 tax year.
2. The data is for *young* graduates only – those who graduated before age 24.

F10.6

New Zealand firms pay close to international wages for entry-level workers in some IT occupations. They pay much less than Australian firms in the upper ranges of remuneration, perhaps because the scope and responsibilities of these high-end jobs are greater in Australia. IT graduate earnings in New Zealand are high relative to graduates in most other fields of study.

10.3 Global shortages in IT skills have emerged over the last decade – New Zealand is no exception

The dotcom bust, economic conditions over the following decade and uninterrupted growth in the use of ICT combined to produce a sharp decline in IT graduations at the same time as IT jobs continued to rise in the IT-using industries. The result has been an emerging global shortage of IT professionals. Predictions of an impending shortage appeared as early as 2007 (HECSU, 2007). The issue has attracted the attention of many governments and quasi-governmental agencies.⁹⁷ Globally, IT jobs rank seventh in a list of the top ten jobs that employers find hard to fill (ManpowerGroup, 2013).

It is not surprising that New Zealand has been facing similar concerns. New Zealand shares an international market for IT graduates and has experienced strong growth in IT jobs at the same time as a decline in graduates with IT qualifications (section 10.2). In 2012, around half of employers in the computer system design sector (which employs more than a third of all IT workers) reported that they found it hard or very hard to recruit IT professionals and managers. More than half stated that it was hard or very hard to recruit IT technicians and associated professionals (MBIE, 2013f). ICT-using and producing firms have been reporting recruitment difficulties for some years (NZICT Group, 2009; Shearer & Trewinnard, 2012; Robertson, 2013). In 2012, the ANZ Business Barometer found that 33% of businesses in the IT/technology industry reported concerns about the lack of skills, which ranked 6th out of 19 industries surveyed (ANZ, 2012).

Fast-growing companies such as Xero place a premium on “hiring the best” and consequently find “[i]t is a challenge to find suitably qualified, experienced and savvy people who also fit our culture” (Natasha Hubbard, General Manager Human Resources at Xero, quoted in Doesburg, 2013). This finding is

⁹⁷ See Didero, Hüsing & Korte (2009) for Europe, Nordicity & Ticoll (2012) for Canada, and the Australian Workforce Productivity Agency (2013) for Australia.

consistent with evidence that companies that pay higher wages are more likely to report hiring difficulties, and that these difficulties persist over the business cycle and are independent of local labour market conditions (Fabling & Maré, 2013). Trade Me told the Commission that “[h]iring IT professionals is difficult all over the world, and it doesn’t seem especially harder here in Wellington” (direct communication). Trade Me confirmed that “hiring the right people, great people with the right attitude, reasonable skills and the ability to learn quickly, is often what makes it hard, rather than necessarily finding people with the right skills”.

As graduate numbers rebound, perceived skills shortages may be more a matter of quality rather than quantity.

More broadly, there is some evidence that New Zealand lacks a good cohort of ICT-savvy managers and directors. About 10% of members of the New Zealand Institute of Directors have a technical background, though younger directors have a better technical knowledge. CIOs and IT managers are still seen as too detail-oriented, tactical and narrow in outlook to make effective board members (Putt, 2012). Yet the evidence shows that firms are much more likely to make productive use of ICT investments if their senior managers and directors are trained in and have experience with ICT (Boritz & Lim, 2007).

Consequences of IT skills shortages

IT skills shortages can cause firms to delay investing in IT (section 10.1). New Zealand has little evidence to show whether and how much a shortage of IT skills impacts on investing in IT. The Commission’s business survey (Chapter 1) found that only 7% of service firms *not* investing in ICT in the previous two years gave skills shortages as a reason (Chapter 9). Yet this reason was more commonly given by non-investing service businesses with 20–49 employees (52% of such firms). Very large service firms with over 100 employees did not cite this reason (0% of such firms).

Anecdotal evidence suggests that IT skills shortages are having an effect on business development in New Zealand. Orion Health says that they could develop more of their software in New Zealand if they could find suitable people. Two of its four software development centres are located overseas (Doesburg, 2013). This is consistent with the evidence that skills shortages reduce investments in technology (section 10.1).

F10.7

New Zealand firms, like firms in most other developed countries, report significant difficulty in recruiting IT professionals and managers. Some New Zealand firms are limiting their IT investments or sending work overseas because they cannot recruit enough skilled IT professionals in New Zealand.

10.4 Improving the response to the demand for IT skills

Improving the speed of response to demand

Markets for skills exhibit lags and cycles of oversupply and undersupply. Wages respond slowly to emerging shortages and time is required for potential students to recognise the increase in demand and acquire the necessary skills (Forth & Mason, 2006). Education providers may also be slow in expanding training places and adjusting programmes to reflect emerging technologies and business practices. Adjustment may require new capital investment and employing more or different staff. By the time students graduate, demand for their skills may have changed. Policies that speed responses to market changes may reduce the amplitude of cycles.

Some universities, such as Victoria University, offer one-year graduate diplomas in computer science. In principle, this allows graduates in other disciplines to quickly complete a degree-level qualification in computer science. In practice, more time is needed to do pre-requisites for the advanced technical papers required for the qualification. Staff in the School of Engineering and Computer Science at Victoria University told the Commission that it would be more realistic to complete a graduate diploma over two years of part-time study. This would suit somebody already in employment. An intensive one-year programme would

require dedicated staff and facilities that could only be justified if demand was high. Currently Victoria University has no students undertaking a graduate diploma in computer science.

Based on current enrolments, IT graduate numbers are set to rise rapidly over the next several years, so the number of graduates may not be an issue for employers. If a shortage were to re-emerge, then active promotion of a one-year graduate diploma in computer science might be a means to speed the supply response.⁹⁸

Matching the supply of skills to business demand

Businesses often complain that computer science graduates do not have the range of skills that they require (see, for instance, Norman & Oakden, forthcoming). Missing capabilities include business skills, the ability to understand how IT contributes to a business strategy, specific technical skills (such as a programming language) or even attitudes and the ability to work in a team. Yet it is unrealistic to expect tertiary education providers to gear their programmes to meet every conceivable skill demand for all the different kinds of jobs that their students will end up in.

Professor Stephen G. MacDonell of Otago University told the Commission that computer science departments in universities do not necessarily see their role as producing graduates to work in business. They may see themselves more as developing technical expertise within a scientific paradigm. On this view, the role of tertiary education is to give students a foundation on which they can build further learning in a variety of employment. Dr Peter Andreae of the School of Engineering and Computer Science at Victoria University told the Commission that “an investment from companies into the targeted training and mentoring that addresses their particular needs” is required (direct communication). The New Zealand Council of Trade Unions submitted that “[i]t is inescapable that most specific skills must be taught by the employers themselves ... What does appear to be different to 20-30 years ago is that employers seem to be reluctant to take on this responsibility” (sub. 205, p. 17).

Yet questions remain about whether the match between tertiary education and business demand can be improved, and by what means.

This is a much wider issue than for computer science graduates alone. Tertiary education around the world is being challenged for its lack of fit with employers’ requirements (McKinsey, 2012). The disconnect is pervasive across countries, fields of study and at all levels of tertiary study. Education providers’ assessments of graduates’ capabilities is systematically higher than employers’ assessments. Education providers tend to rate technical skills and subject knowledge as more important than do employers. Providers also have a poor knowledge of and tend to overestimate job placement rates for their graduates. Only 50% of young people think their studies helped their chances of finding a job, and a majority are unconvinced that they made the right decision to attend their particular institution.⁹⁹

At the same time, tertiary education is facing other fundamental challenges to its established ways of operating. Many of the skills and capabilities currently taught in tertiary education are likely to become redundant in the next 20 years as a result of computerisation (Frey & Osborne, 2013; Elliott, 2014; Chapter 8). If so, tertiary education will experience a rapid shift in demand for the types of knowledge and skills they teach, as students shift into fields less amenable to computerisation. Yet, as currently designed, public education institutions (in particular) are ill-suited to respond quickly to large market shifts.

The typical tertiary education provider also faces challenges from other directions. The development of massive open online courses (MOOCs) raises the possibility that local offerings will be increasingly tailored to supplement those of world-leading academics and institutions. The local provider may specialise in helping less able or less motivated students to keep abreast of current learning. Learning for the workplace may increasingly shift to other venues. Accelerators, for instance, are rapidly becoming venues for learning how to innovate technologically – “in essence, schools for startups” (*The Economist*, 2014). More emphasis

⁹⁸ Ireland has adopted a similar approach as part of its ICT action plan, though with more emphasis on 1-year post-graduate programmes (Department of Education and Skills, Ireland, 2012).

⁹⁹ McKinsey (2012) is based on surveys of students, employers and education providers in 9 countries (Brazil, Germany, India, Mexico, Morocco, Saudi Arabia, Turkey, the United Kingdom and the United States) supplemented by a study of 100 education-to-employment initiatives in 25 countries.

on workplace-based learning or simulating workplace experience, third-party accreditation of the skills required by employers, and the role of intermediaries in bridging the gap between classroom and work are all developments that are likely to require tertiary education providers to re-engineer their programmes (McKinsey, 2012).

“Business as usual” is not likely to be an option for tertiary education providers. Successive versions of the Government’s Tertiary Education Strategy have made this point ever more strongly. The first priority in the current strategy is “delivering skills for industry”. The strategy states:

We need ... more explicit co-operation between industry and TEOs [Tertiary Education Organisations] about the types of skills that are most needed, and how best to develop them. TEOs need to create opportunities for industry involvement in planning and delivering education ... while industry will need to clearly identify its medium and long term needs, and attract and retain the talent it requires. (Ministry of Education, 2014, p. 10)

Against this background, computer science and information science offer particular challenges. IT is developing extremely rapidly (Chapter 8) and, as noted above, firms instead of academic institutions are driving a large proportion of IT innovation. Unless these institutions have close links with business, IT academics will find it hard to keep up with the pace of innovation (Norman & Oakden, forthcoming). This makes it harder for tertiary education providers to prepare students for IT careers than in more established disciplines such as engineering, law or medicine. Unlike these disciplines, IT does not have well-established industry institutions and practices to help students bridge the gap between academic learning and work.¹⁰⁰

The future design of tertiary education policies and institutions is fluid and uncertain, and beyond the scope of this inquiry. The rest of this chapter looks at initiatives that should help address more immediate concerns while likely being consistent with longer-term developments.

Improving incentives to better match supply with demand

Tertiary education funding largely follows student numbers agreed in broad terms between the Tertiary Education Commission (TEC) and tertiary education providers through their investment plans. Student choices about their courses and tertiary education providers are the main drivers of funding. In turn, students’ knowledge of earnings differences across fields of study has an influence on the study choices of a small but significant group of students (Arcidiacono, Hotz & Kang, 2012; Arcidiacono et al., 2013; Long, Goldhaber & Huntington-Klein, 2014).

Recently the Ministry of Education has started to publish regular information on graduate employment and earnings outcomes by field of study, but not by education provider (Mahoney, Park & Smyth, 2013). Better information for intending students about the employment and earnings outcomes of graduates with qualifications gained from *particular providers* will sharpen incentives for tertiary education providers to tailor their programmes to industry needs.

The Ministry and the TEC are currently exploring with tertiary providers a means to improve information available to providers on their student outcomes by qualification. Providers will be able to compare their students’ outcomes with national benchmarks. Extending this to include outcomes by field of study is technically feasible (subject to numbers at particular institutions being large enough to provide stable results over time and protect confidentiality). Ultimately there should be no technical barrier to this information being made available to intending students.

R10.2

The Ministry of Education and the Tertiary Education Commission should continue to work with tertiary education providers to make information available on student employment outcomes by tertiary education provider, qualification and, where numbers are sufficient, by field of study. Once a robust information system is in place, the Ministry should regularly publish information on student outcomes by tertiary provider to help intending students with their choices.

¹⁰⁰ See McKinsey (2012) for a discussion of the broader issues in managing the interface between education and employment.

Equipping computer science graduates with business skills

To get the best from IT investments, firms need effective business and entrepreneurial skills to complement technical IT skills (section 10.1). Under current arrangements many IT graduates do not meet these employer requirements. They might acquire business skills either by combining computer science and business studies and/or through relevant work experience while studying. This subsection looks at opportunities to combine computer science with business studies. The next section looks at collaboration between education providers and businesses to provide students with relevant work experience.

Combining business studies with computer science

New Zealand universities regularly offer the opportunity for students to undertake double majors or joint degrees in computer science and business studies.¹⁰¹ Students are only able to enrol in a joint degree if they establish and maintain a good study record. Formally, a joint degree takes 4 years (compared to 3 years for a single degree). In practice, timetabling issues and the need to complete pre-requisites mean that a joint degree is likely to take a minimum of 4.5 years. Timetabling issues are likely to be more acute in smaller universities, where the number of streams for each course is limited. Auckland University told the Commission that it uses sophisticated algorithms to timetable lectures to best match the combinations that students demand. Auckland University typically has multiple streams for each course.

Staff in the School of Engineering and Computer Science at Victoria University told the Commission that the more flexible arrangements for joint degrees in computer science and commerce it once offered were popular. However, Victoria University has since made its requirements more restrictive to fit with those of other New Zealand universities. There is now little demand from students for joint degrees of this sort.

Business students need to be IT-literate to succeed in a world where IT is increasingly used to shape business strategy. IT studies provide the foundation to become IT-conversant managers and CEOs (Professor Stephen G. MacDonell, Otago University, sub. 106). Information science, information systems and information management are offered in the business schools of tertiary institutions. In 2013, 118 business studies students at Auckland University (around 10% of all business studies students completing a qualification) completed a qualification with a major or minor in computer science or a related field.

Professor MacDonell notes that it is easy for business students to skip technical IT courses (sub. 106). Yet university business study courses typically combine compulsory papers in seven separate disciplines (including IT) together with advanced studies in a limited selection of these. It would be difficult to make additional IT courses compulsory, but it is clearly important to make sure that students get the most out of the information science paper that is compulsory.

New Zealand universities provide for computer science (and other) graduates to complete a one-year graduate diploma in business studies or commerce. There appears to be little current demand for this combination of studies, perhaps because the job market is very buoyant for computer science graduates. Yet the combination would better prepare students for work in firms where IT is closely integrated into business strategy. Promotion of this path could be targeted at students who have already been successful in their studies and have developed a clearer idea of their future career paths. Students would benefit from having a wider range of skills and more flexible career options.

R10.3

The Tertiary Education Commission and the Ministry of Business, Innovation and Employment should encourage tertiary education providers and IT industry and professional associations to promote one-year graduate diplomas in business studies for computer science graduates. This will better prepare IT graduates for work in firms whose business strategy is based on IT.

¹⁰¹ A double major refers to a student completing a single degree, while taking two fields to an advanced level. A joint degree refers to a student completing two degrees concurrently. At least at Victoria University, a second major can be completed in a discipline from outside the faculty to which a student belongs.

Collaboration between tertiary education providers and business

Work experience related to their studies is an effective way for computer science students to learn how to apply their skills in a business environment. Yet only a minority of IT students have the opportunity to gain significant experience of a business environment during their study.

Some computer science faculty are actively working with students and businesses to find suitable work placements. Victoria University, for instance, has a close relationship with the Summer of Tech programme (Box 10.2). Current tertiary education funding arrangements do not provide strong incentives for providers to take on the cost of establishing and maintaining links with firms. So the work of an intermediary organisation, Summer of Tech, largely funded by participating firms and by voluntary effort, appears to have been a significant factor in maintaining a stable programme of collaboration. Yet even this programme places only a minority of eligible students. Attracting more businesses into the programme would help.

Auckland University told the Commission that 35% of its students (in all faculties) at second year and above find study-related work engagements. Almost all students who engage in a work placement are very positive about the experience and the impact of it on their studies.

Box 10.2 Summer of Tech – a successful programme for finding internships for IT students

Summer of Tech is a successful Wellington-based programme that places computer science students in summer internships. Small hi-tech firms involved with Creative HQ initiated it in 2006.¹⁰² The programme relies on a combination of voluntary hours, services in kind, sponsorship income and fees paid by participating businesses. Sponsors include Xero, Trade Me and Kiwibank. Tertiary education providers, especially Victoria University, make in-kind contributions.

Businesses pay \$500 to register and a \$1 000 fee for each student they employ. During the year, Summer of Tech holds “bootcamp” workshops to help students learn about obtaining employment and about technical matters. Over summer, additional seminars are held on technical subjects – usually presented by businesses.

Around September, businesses are invited to introduce themselves to students, and this is followed shortly after by a “speed dating” event. This may result in a student receiving a job offer, which must be transacted online. Businesses are required to pay students at least \$18 an hour, but competition for the better students is high and average rates are close to \$30 an hour.

Summer of Tech placed 71 IT students in internships with 33 mostly Wellington-based companies in 2013/14. About 700 students register each year, so only a small proportion find employment. About a third of registering students are sufficiently advanced in their studies to be “ready to be hired”. Eighty percent of registered students are from Victoria University.

Summer of Tech measures success in terms of continuing engagement between the student and their employer (in one form or another, including employment). About two-thirds of students who get internships are “retained”. Norman and Oakden (forthcoming) refer to one Wellington ICT company that recruits most of its staff through Summer of Tech.

Summer of Tech is cautiously looking at expanding its operations into Auckland (in discussion with Auckland Tourism Events and Economic Development) and Palmerston North. The Dunedin City Council used Summer of Tech as a model for its Sexy Summer Jobs programme. The Canterbury Development Corporation looked at running a pilot programme. Trade Me recommends that initiatives like Summer of Tech be set up in other centres (sub. 214).

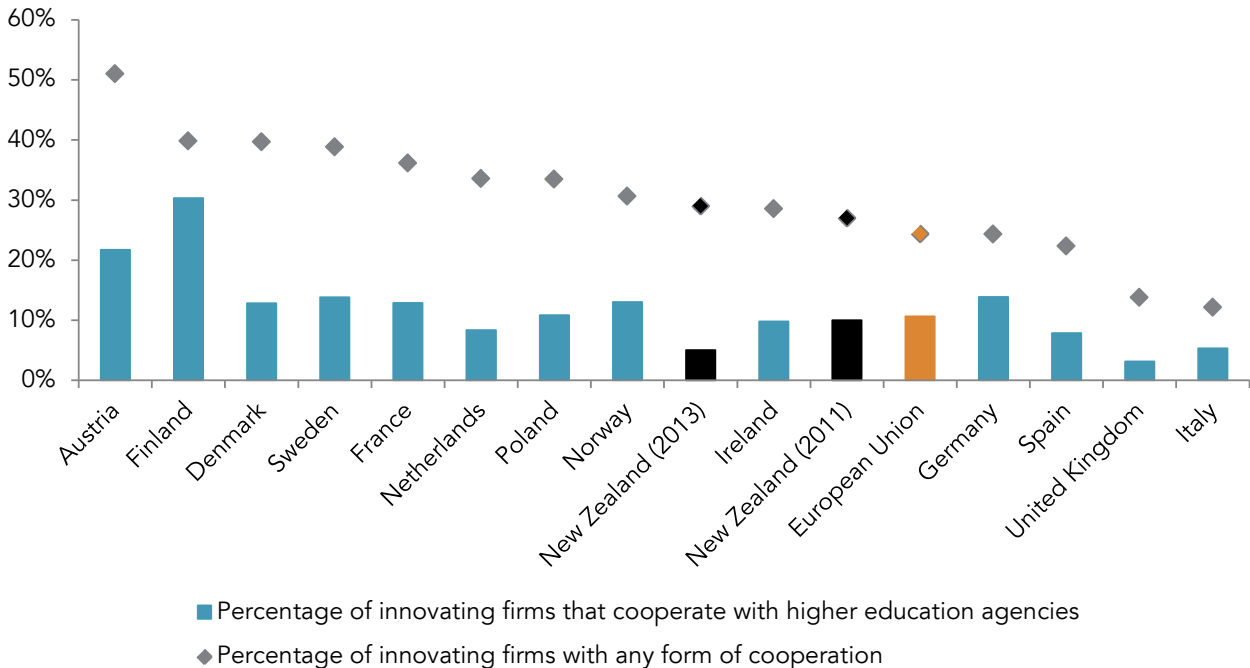
Source: Ruth McDavitt, Coordinator, Summer of Tech; Summer of Tech, 2013.

¹⁰² Creative HQ is a start-up incubator supported by the Wellington Regional Council (through Grow Wellington) and the Wellington City Council.

Collaboration between innovative New Zealand businesses and universities is limited

New Zealand firms are much less likely than firms in most European countries to innovate in a product or process (Figure 10.5, note 1). Of innovating firms, a moderate proportion cooperate with other firms or institutions. Only a moderate to low proportion of innovating firms in New Zealand cooperates with universities or other higher education institutions (Figure 10.5). A smaller proportion (4%) of R&D carried out by universities in New Zealand is funded by businesses than in most OECD countries (6% on average) (OECD, 2014).

Figure 10.5 Innovating firms and cooperation, 2010–2013



Source: 2011 and 2013 Statistics New Zealand business operations survey; 2010 Eurostat community innovation survey.

Notes:

1. Innovating firms are those that undertook a product or process innovation in the previous two years. New Zealand has one of the lowest proportions (28% in 2011) of all firms that undertook a product or process innovation. The proportion of such firms in Germany was 64% and in Sweden 49%.
2. European firms were asked about collaboration with universities and other higher education providers. New Zealand firms were asked about collaboration with universities, institutes of technology and polytechnics.
3. The EU average is a weighted average over 15 countries.

Reasons why New Zealand firms may have low levels of cooperation with universities include:

- New Zealand firms have low rates of R&D: innovation involving R&D is more likely to stimulate links with researchers in universities than other forms of innovation; and
- New Zealand universities may be relatively weakly oriented to working with business: by contrast, Finland has formal institutions that link universities with business, which likely explains that country's high rates of cooperation between innovative businesses and higher education institutions (Figure 10.5).

Evidence suggests that the presence of industry intermediaries assists collaboration both among businesses and between businesses and education providers. Industry-based intermediaries that could fulfil this role for ICT skills in New Zealand are weak. In their recent survey of "knowledge sector" firms in the Wellington region, Norman and Oakden found that "the ICT sector appeared to be struggling to create networks of potential benefit to the industry as a whole" (forthcoming, p. 54). Organisations competing for influence represent different parts of the ICT-producing and ICT-using industries, and ICT professionals.

Larger firms have the resources to bridge the academic-to-work gap

Larger established ICT-producing firms (such as Datacom, Xero, Vodafone and Telecom) and ICT-using firms (eg, Trade Me, banks and finance companies) often have induction programmes for graduates, and offer higher starting salaries. Many IT graduates see these firms as their preferred choice and the firms put a high priority on employing graduates who best fit their business strategy. An IT graduate who joins one of these firms can learn about current industry best practice, the proprietary systems that are in use, and how IT fits with the firm's business. Their employer bears the costs of their on-the-job training and aims to keep them in the firm by offering a competitive salary and an attractive work culture. Such IT firms have the scale to provide the training that bridges the gap between academic learning and work.

Large firms are also active participants in programmes such as Summer of Tech (Trade Me, sub. 214), and maintain direct links with the computer science faculties of universities. These links give firms the opportunity to assess the quality of students over time. Their participation in collaborative programmes helps make the latter viable, thus also benefiting smaller firms.

F10.8

Larger ICT-using and ICT-producing firms use their resources to employ top IT graduates. These firms provide induction programmes that help graduates learn quickly about the business environment and proprietary systems. The firms also offer internships to IT students. This arrangement helps them identify the best talent.

Small firms find it particularly hard to recruit "business-ready" IT graduates

Small ICT-producing and ICT-using firms have fewer resources than large firms to confidently take on the risks of employing untried new graduates. They are unable to offer graduates the broad work experience available in large firms. Unlike more established professions, IT professionals do not have a widely-accepted, well-developed training and development infrastructure that small firms can rely on when employing graduates. Without this infrastructure, smaller ICT firms find it hard to keep links with tertiary education providers and to meet and work with students before graduation, such as through in-study employment and work-based education projects. Small ICT-using firms are spread throughout the economy. This makes it even harder for industry initiatives to fill this gap.

F10.9

Small ICT-producing and ICT-using firms find it hard to recruit IT graduates who have the range of skills needed to operate successfully in their business environment. Such firms find it hard to collaborate with other similar firms and with tertiary education providers to help students gain a broader range of skills before graduation.

Small ICT-producing firms have clustered in Auckland, Christchurch and Wellington. Local authorities and central government have encouraged the development of clusters as places where firms can collaborate to exchange knowledge, where personnel can flow easily between firms, and where firms and personnel can interact with academics. One benefit is that the firms reduce their risks in finding suitable IT professionals by locating in places where such professionals are concentrated. A second benefit is that IT professionals reduce their employment risks by locating in an area with a number of potential employers. Yet co-location may lead to job-hopping and poaching. Fear of this may make firms reluctant to invest resources in developing new graduates more than is necessary for immediate business purposes.

One inquiry participant told the Commission that these small ICT firms currently do not readily collaborate with each other or with tertiary education providers to improve the supply of "work-ready" IT graduates. This is partly because of a "cultural disconnect" and poorly aligned incentives, and partly because links rely on individuals and so are not necessarily sustainable. Similar concerns were expressed in a recent survey of Wellington hi-tech firms (Norman & Oakden, forthcoming). Internships would be one valuable way to establish links between universities and firms. Yet establishing and managing them is time-consuming to the host firms and to the tertiary education providers.

The Summer of Tech programme shows that successful self-sustaining collaboration between tertiary education providers and businesses is possible up to a point (Box 10.2). Yet the programme relies on the active support and participation of medium-sized and larger firms and leaves many eligible students without summer placements.

Collaboration between small firms and education providers could be made more sustainable by adjusting current tertiary education funding policies. Some of the funding attached to IT students could be tied to contracted internships and other collaborative arrangements. Education providers could economise on resources by working with firms that were clustered in particular locations. Teaching staff would benefit by having closer links with firms where IT innovation is taking place. Firms in these clusters would find it easier to collaborate with each other to work with the education providers. Collaboration would also reduce the cost to each firm of setting up internships and let them better replicate the learning opportunities that larger firms offer graduates. The benefits to these firms would be an improved flow of “work-ready” IT graduates, and better matching of graduates to work opportunities. These arrangements would likely involve the development of new intermediaries to carry collaboration forward.

If a collaborative initiative focused on small ICT-producing firms in clusters proves successful, it may be possible to use that initiative as a model to extend to other small ICT-producing and ICT-using firms.

R10.4

The Tertiary Education Commission and the Ministry of Business, Innovation and Employment should work with industry associations, IT firms and education providers to develop initiatives that enable greater engagement and collaboration between education providers and ICT firms, especially small firms. This collaboration should aim to increase the supply of “work-ready” graduates.

10.5 Summing up: finding skills for the ICT revolution

New Zealand’s experience of IT skills shortages over the last seven years has been similar to that of many other countries. Demand has been driven by the increasing importance of IT in the global economy, while supply of graduates slumped after the dotcom bust around 2000. Supply has started to accelerate and New Zealand fills many IT positions through migration. This skills shortage reflects a massive shift in the demand for ICT skills globally. The return to balance between supply and demand in New Zealand will come about through a mix of public policy, immigration and market forces over time.

A more pressing problem expressed by firms is finding IT professionals with the range of skills required by their business. Although not unique to IT, the fact that IT is rapidly evolving makes the problem more acute. What IT students learn is not always current.

Successful adoption and use of IT among firms in the services sector requires a mix of skills. Business qualifications should be designed so that future managers are knowledgeable about IT, the benefits it can bring, and how it can be integrated into business practices. Equally, service firms often seek IT graduates with good business skills, pointing to the need for flexible, short courses covering such skills.

Addressing all these problems is not easy, and requires action from the IT industry, firms that rely on IT graduates, professional bodies, and education providers. Improved collaboration between firms and tertiary education providers would help students gain a fuller range of skills before graduation. Intermediaries, particularly those arising from industry initiatives, can play a valuable role in bridging the gap between the classroom and the workplace.

11 Cloud computing

Key points

- Cloud computing encapsulates many ideas, including that the ownership of data can be separated from its physical location and direct control; data should be stored and processed wherever cheapest; services are best rented on an as-needed basis; and access to services across devices and locations should be seamless.
- Cloud computing is changing how information and communications technology (ICT) services are delivered around the world. Cloud computing is driven by huge economies of scale and scope in the centralised storage and processing of data, falling data transport costs, near global internet connectivity and consumer preference for flexibility and mobility.
- Firms that are small users of ICT should benefit disproportionately from the improved scalability offered by cloud computing. Yet surveys suggest that small firms in New Zealand are slow adopters of cloud computing. Factors such as the costs of complementary investments or obtaining relevant knowledge may be discouraging adoption.
- Cloud computing assists New Zealand digital service exporters through access to foreign ICT infrastructure at the same price as their foreign competitors.
- One barrier to cloud computing is the psychological shift from physical control of data to control via contract. Overcoming this barrier typically involves designing contracts and institutions to minimise risk and to allocate it to those best able to bear it, and building trust in those contracts and institutions.
- Restrictions on data flows will have a disproportionately negative effect on small countries, which lack the scale to support a wide range of sophisticated, home-grown, digital services. The Ministry of Foreign Affairs and Trade and other government agencies should prioritise negotiations on the free flow of data and other internet issues.
- Global-scale cloud computing infrastructure has only just arrived in Australia, and it will take even longer to get to New Zealand. New Zealand policy should support efficient use of Australian infrastructure.
- The government cloud computing programme – based on published rules and guidance – is highly risk averse, and may send a poor signal to private firms. The Government should assess how it can support and facilitate a balanced approach to adoption. Legal or privacy issues associated with cloud computing should be dealt with through international negotiations. Resolving such issues will help New Zealand firms make more productive use of cloud computing services.

Cloud computing is changing the way that information and communication technology (ICT) services are delivered around the world. This chapter looks at the drivers of cloud computing, its potential benefits, and barriers to its adoption in New Zealand.

The Commission chose to devote a chapter to cloud computing as a specific technology with likely widespread and ongoing effects (Box 11.1).

Box 11.1 Why did the Commission choose to examine cloud computing?

ICT is a general purpose technology with effects that play out over decades. Each wave of new technology and applications creates – in an unpredictable way – further waves of “spin-off” technology and applications (Chapter 8).

A great many potential technologies and trends compete for the attention of suppliers, customers and commentators at any point in time. Only history will tell which of these will play a major role, a minor role or prove irrelevant.

Technologies and trends capturing media and academic attention at the moment include mobile devices, social media, machine-to-machine connectivity,¹⁰³ big data, crypto-currencies, 3D printing and the semantic web. NZRise submitted that the Commission should have covered open source software:

One of the most egregious omissions [from] the [2nd interim] report is any discussion on a phenomenon that has revolutionised technology based opportunity: open source software. In the last 20 years there is hardly a single major success story in the technical and services revolution that is **not** based on open source software and the opportunity that software provides organisations to make giant steps forward. Google, Facebook, Rackspace, Amazon and indeed the Internet itself, owe their success to open source and open protocols. (sub. 209, p. 2)

Open source software has had some dramatic effects, reflecting its interesting economic characteristics (Lerner & Tirole, 2002). The costs, benefits and risks for its producers and consumers differ substantially from those of proprietary software. Open source started in the 1980s, and its popularity increased dramatically during the 1990s. Few firms today make a hard decision between open source and proprietary software; instead most firms produce and/or use a combination that matches their capabilities, opportunities and strategies (Hawkins, 2004; Fosfuri, Giarratana & Luzzi, 2008; Caulkins et al., 2013). The Commission is not aware of any specific barriers to New Zealand firms choosing the combination that best suits them.

The Commission decided to provide a more in-depth examination of one technology trend rather than a briefer discussion of many. It chose cloud computing as a particularly influential global trend that could have disproportionate costs and benefits for New Zealand service firms, given the country’s geographic isolation.

11.1 What is cloud computing?

“Cloud computing” is a loosely defined term. It encapsulates the ideas that:

- ownership of data can be separated from its physical location and direct control;
- data should be stored and processed wherever cheapest;
- services are best rented on an as-needed basis; and
- access to services across devices and locations should be seamless.

Box 11.2 explores some definitions of cloud computing. From the – predominantly economic – perspective of this report, the important characteristics are widespread network access (reducing geographic constraints), resource pooling (lowering costs), on-demand service (to adjust to peaks and troughs in use), and metered service (users pay only for what they use).

¹⁰³ Also known as the “internet of things”.

Box 11.2 Defining cloud computing

There is no single agreed definition of cloud computing. The New Zealand Institute of IT Professionals defines it as:

On-demand scalable resources such as networks, servers and applications which are provided as a service, are accessible by the end user and can be rapidly provisioned [ie, configured and started] and released [ie, stopped] with minimal effort or service provider interaction. (IITP, 2013, p. 3)

The US National Institute of Standards and Technology lists five essential characteristics of cloud computing:

- *On-demand self-service.* Customers can purchase, configure and use computing capabilities, such as server time and network storage, without human interaction with each service provider.
- *Broad network access.* Services are available over the network and can be accessed from a variety of devices such as a mobile phone, tablet, laptop or desktop.
- *Resource pooling.* Providers pool computing resources to serve multiple consumers, with resources dynamically assigned and reassigned. Customers generally have no control or knowledge over the exact location of the provided resources, but may be able to specify location at a higher level of abstraction (such as country or region).
- *Rapid elasticity.* Resources are allocated and released to scale to match real-time demand.
- *Measured service.* Cloud resources are typically metered in units appropriate to the type of service (eg, storage, processing and bandwidth). (Mell & Grance, 2011)

These definitions relate cloud computing to technology that provides services to firms on which they may build further services – for their own or their customers' use. The end consumer of a service cannot necessarily determine whether or not – or the degree to which – cloud computing technologies are being used to provide that service.

The shift from in-house to cloud computing – from the immediate physical control of data to control via contract – is as much psychological as technological. People are generally comfortable with the idea that crucial information about one's business or life can be stored digitally on physical media such as disk drives, that locks on the door can prevent unwanted access and that multiple physical copies can protect against disaster.

Cloud computing requires people to trust other people and entities with their data and its security. The risks will vary, depending on the type of service and the data it handles.

Similar issues were no doubt faced when the electricity grid became available for firms reliant on their own power sources such as water or steam. New contracts, institutions and laws were required to resolve information and bargaining asymmetries, and to encourage efficient use of a grid that connects diverse producers to diverse consumers.

F11.1

One barrier to cloud computing is the psychological shift from physical control of data to control via contract. Overcoming this barrier typically involves designing contracts and institutions to minimise risk and to allocate it to those best able to bear it, and building trust in those contracts and institutions.

Types of cloud computing

Cloud computing products are usefully separated into three types (Mell & Grance, 2011):

- *software-as-a-service* (SaaS) – includes the use of consumer-oriented cloud applications (eg, Dropbox, Gmail, iCloud, Google Maps) and business-oriented applications (eg, Salesforce, Xero, and Office 365);¹⁰⁴
- *platform-as-a-service* (PaaS) – cloud computing platforms (such as Amazon Web Services, Microsoft Windows Azure, and Google App Engine);¹⁰⁵ and
- *infrastructure-as-a-service* (IaaS) – rental of computing and storage infrastructure (such as Rackspace, IBM SmartCloud, and Revera Homeland).¹⁰⁶

Businesses are potential customers for each of these three types of products. Some businesses further use these products to offer online services to their own customers. Shopify, for example, is a SaaS product that lets firms create their own online stores.

The supply of cloud computing has huge economies of scale

The trend towards cloud computing is driven by huge economies of scale and scope in the centralised storage and processing of data (Hamilton, 2008). The price advantage of very large data centres over medium-sized data centres has been estimated at between three and seven times (Armbrust et al., 2009).¹⁰⁷

Other important trends include falling data transport costs (Chapter 9), near worldwide internet connectivity and a significant consumer premium on mobility. These trends have reshaped the ICT world over the past decade and show no signs of abating in the near term.

High fixed costs and low variable costs are typical in ICT products (Chapter 8). The cloud computing model is subject to high fixed costs. Cloud service providers usually bear these costs and recover them through their (variable) charges. Their customers mainly face variable costs. The consolidation of fixed costs with service providers also lets providers spread demand risk¹⁰⁸ across their customer base, and benefit from economies of scale in purchasing, financing and staffing.

The effect of scale shows in the prices of US, Australian and New Zealand cloud providers. The Commission performed a comparison of publicly-quoted IaaS prices, and found that providers in larger markets offered more options and significantly lower prices (Box 11.3).

Box 11.3 IaaS is cheaper in the United States and Australia

The Commission compared the online price of renting a virtual server with at least 10GB disk space, 60GB data traffic and 1GB RAM hosted in New Zealand, the United States and Australia.¹⁰⁹ The three cheapest prices for each location were approximately:

¹⁰⁴ Dropbox provides cloud file storage and synchronisation across multiple devices. Gmail is a cloud-based email client. iCloud provides email, calendar, contacts, reminders, web-based spreadsheets, word processing and presentations, device backups and synchronisation. Salesforce is a customer relationship manager. Xero provides small-business accounting. Office 365 is a cloud-enabled version of Microsoft Office.

¹⁰⁵ Amazon Web Services, Microsoft Windows Azure and Google App Engine provide (on a rental basis) physical and software infrastructure that firms and government agencies use to develop and host complex websites and applications in the cloud. Amazon and Microsoft also offer IaaS services under these brands.

¹⁰⁶ Rackspace, IBM SmartCloud and Revera Homeland rent physical and virtual servers in their own data centres.

¹⁰⁷ In this comparison, very large data centres had tens of thousands of computers versus medium-sized data centres with hundreds or thousands.

¹⁰⁸ Demand risk, in this context, is the risk that a firm purchases too little, or too much, infrastructure to efficiently meet customer demand.

¹⁰⁹ The Commission examined the price of several server configurations to ensure a balanced comparison. The data was collected in early April 2014 and included 14 New Zealand providers, 17 Australian providers and over 100 US providers.

- New Zealand – NZ\$60/month.¹¹⁰
- Australia – NZ\$20/month.¹¹¹
- United States – NZ\$10/month.¹¹²

New Zealand-hosted services were consistently more expensive, particularly where high volumes of disk space and bandwidth were required. US-hosted services were about one-sixth of the New Zealand price. Australian-hosted services were significantly cheaper than those hosted in New Zealand, but more expensive than US-hosted services. There were significantly more providers in these larger markets, and the differences between local prices were smaller.

US-hosted services offered much greater data traffic as part of their packages. Mid-range New Zealand-hosted packages typically include a specific limit of 40-60GB on international traffic, whereas the US-hosted packages examined above included at least 900GB of traffic (including international traffic).

NZRise submitted that:

With open source technologies, such as OpenStack and Ceph, causing massive and rapid disruption, it is the smaller data centres that are able to roll out new services, applying new techniques and technologies at a far faster speed than those that have been built at very large scale. Local NZ cloud providers are now able to offer cloud computing infrastructure at prices that are lower than both Rackspace and Amazon. (sub. 209, p. 4)

The Commission has found no evidence of New Zealand prices below international ones for advertised cloud infrastructure products. This does not rule out a competitive market for local provision. Technological disruption generally favours smaller, nimbler providers – as noted by NZRise. Local providers are generally favoured by regulation (section 11.4), latency (Box 11.6) and easier opportunities for face-to-face negotiation of customised contracts. Economies of scale will likely drive international provision of mass-market services and local provision of more specialised or niche services.

F11.2

Cloud computing infrastructure providers in the United States and Australia offer more options and significantly lower prices than equivalent New Zealand providers.

Providing PaaS and IaaS on a global scale is sufficiently capital intensive that only a few companies compete in these markets (Box 11.4).

Box 11.4 Global competition to provide cloud services

Some of the most influential global technology companies – Google, Microsoft, IBM and Amazon – are using clouds to compete for the corporate and government computing markets.

Businesses are moving from owning their computers to renting data-crunching power and software over the internet. Providers are making big promises about computing clouds. For example, supercomputing-based research need not be limited to organisations that can afford supercomputers. And technology companies with a hot idea will be able to expand rapidly, without the need to build and maintain their own computer networks.

The Snapchat photo-swapping service processes 4 000 pictures a second on Google's servers. It is just

¹¹⁰ The three providers with lowest prices were Affinity, OpenHost and CompleteHost.

¹¹¹ The three providers with lowest prices were Network Presence, Echoman and ServerMule.

¹¹² CompareVPS identified many competing providers with similarly low prices. The three providers with the lowest prices were Azza VPS, Cloud Shards and Atlantic.Net

two years old and has fewer than 30 employees. The company was chosen by Google to be an early customer of its cloud. Snapchat has never owned a computer server. This is a big shift from the days when knowing how to build a complex data centre was as important as creating a popular service.

Amazon's cloud, Amazon Web Services, was arguably the pioneer of the public cloud and for now is the largest player. Amazon's cloud has hundreds of thousands of customers, including big names like Netflix, which stopped building its own data centres in 2008 and had completely moved to Amazon's cloud by 2012. All of Amazon's own retail services also run inside that cloud. According to one analysis, Amazon's cloud has five times the computing capacity of its next 14 competitors combined (Asay, 2013).

3M – a more traditional consumer goods company – is using Microsoft's Azure public cloud to process images for 20 000 individuals and companies in 50 countries to analyse various product designs. Microsoft says Azure handles 100 petabytes¹¹³ of data a day, which equates to about 700 years of high-definition movies.

Each big cloud provider has built a global network of over a million computer servers in the past few years. The companies have re-thought almost every step to maximise efficiency and reduce power use.

Only a few other companies are likely to manage either the capital or the expertise to build such systems. Facebook owns a giant global computing network, but has shown no interest in providing cloud services to other customers.

IBM paid US\$2 billion to buy cloud storage provider SoftLayer Technologies in July 2013. It plans to add 12 new facilities to its existing 25 facilities during 2014.

The biggest promise of these clouds is to make it easy to do computing activities that would have cost millions of dollars in hardware just a few years ago.

Source: Hardy, 2013.

11.2 What does cloud computing offer?

Cost reductions and enhanced functionality from cloud computing potentially benefit all ICT producers and their users. This section explores who might benefit in particular, and how that might affect New Zealand.

Cloud computing is particularly beneficial for small ICT users

Many products and services are "scalable", in the sense that purchasers can buy exactly (or very nearly) the quantity they need. For example, petrol is sold by the fraction of a litre and hotel rooms are sold by the night. Others are imperfectly scalable or "lumpy"; for example it makes little sense to buy half a server or a part-time enterprise resource planning system.

Such lumpy – or imperfectly scalable – technologies disadvantage small users, as they face buying more capacity than they expect to use.

Cloud computing can improve the scalability of ICT products.

- The rent-rather-than-buy nature of cloud products reduces the costs and risks of innovation and experimentation. This is particularly beneficial to start-ups and smaller firms with limited access to capital.
- The shared-use nature of cloud products typically leads to lower overall costs, particularly for firms with regular or irregular peaks and troughs in their computing requirements. For example, an event management firm may need to process tens of thousands of transactions on only a few days each year.

¹¹³ A petabyte is 1024 terabytes, or equivalently, about 1 million gigabytes.

Shared infrastructure means such firms do not need to own IT systems equipped to service peak loads, which sit mostly idle between peaks.

- SaaS products typically have finer-grained pricing than their non-cloud equivalents. Many products are offered that have payment for each transaction (called per-transaction pricing). This can be an advantage for small firms that would otherwise face lumpy pricing schedules.
- IaaS products are available with fine-grained pricing. A firm can rent exactly what it needs; for example, one-third of the capacity of a single server with a spare as and when needed.¹¹⁴ This is a much better use of resources – and likely much more cost-effective – than purchasing two full servers (primary and spare), neither of which is completely used. IaaS is likely to be particularly advantageous for firms with relatively small ICT needs.

Cloud computing helps smaller firms, in particular, manage financial and business risk. Firms can easily and cheaply adjust the quantity of computing, storage, bandwidth or other resources they rent; and do not run the risk of investing in infrastructure or equipment in excess of their requirements or that quickly becomes obsolete.

Software vendors traditionally served smaller customers using feature-based discrimination – offering them cheaper “lite” versions with reduced functionality (Shapiro & Varian, 1999). Cloud-based rental models, such as per-transaction pricing, do not limit the features available to smaller customers (Sapere Research Group and Covec, sub. 105).

F11.3

Cloud computing improves the scalability of ICT products, allowing purchasers to buy the exact quantity and quality they prefer. This is particularly beneficial to firms that are small users of ICT, as they can serve their existing market at lower cost.

Cloud computing benefits digital service exporters

Renting cloud services in other countries lets New Zealand firms that export digital services have similar IT costs to competitors based in those countries. This “levelled playing field” will offer an overall cost advantage to New Zealand firms if other costs (such as labour) are lower than those of their competitors.

IaaS and PaaS services hosted elsewhere help New Zealand-based firms create and export SaaS products. For example, New Zealand service exporter Xero rents servers (IaaS) from Rackspace in the United States to provide its accounting software (SaaS) to customers in North America.

Other examples of New Zealand digital service exporters that use cloud services include the Mi5/iDefigo video surveillance services (Vodafone, sub. 8) and the Vend point-of-sale products.

F11.4

Cloud computing can level the playing field for data-intensive New Zealand service firms competing in foreign markets. This “levelled playing field” will offer an overall cost advantage to New Zealand firms if other costs (such as labour) are lower than those of their competitors.

How cloud computing affects ICT adoption

Cloud computing offers firms:

- lower overall ICT costs than if they had provided the services themselves (McAfee, 2011);
- freedom from having to make large capital outlays on computing hardware; and
- an increased number of product choices.

¹¹⁴ The spare in this example means a secondary server ready to take over the functions of the primary should it fail or require maintenance.

In terms of the adoption model presented in Chapter 9, these factors make ICT adoption more likely, all else being equal. It is a separate question as to whether they will narrow the gap between New Zealand and global ICT adoption. To narrow (or increase) the gap, New Zealand would have to be affected differently by cloud computing. Section 11.3 explores the adoption of cloud computing in New Zealand.

ICT costs are only part of the overall cost-benefit calculation in deciding what ICT to adopt.¹¹⁵ Cheaper ICT costs by themselves may be insufficient to turn an unprofitable investment into a profitable one. In many cases, other factors (such as the lack of relevant skills, limited market size or regulatory barriers) will be more significant than ICT costs.

Cloud computing should be relatively more beneficial for firms with capital constraints, reflecting its effect on fixed costs.

Adjustment costs may be a significant factor in adoption decisions that involve disruptive technologies (Chapter 9). Should cloud computing options be more disruptive to a firm's operations than alternatives, then adjustment costs may negate any cost advantages.

Cloud computing allows digital service providers to service larger geographic markets. This should increase competition and support increased specialisation in those markets. Consumers, including firms, benefit through increased efficiency, sharper pricing and improved chances of finding a product more closely matched to their specific needs.

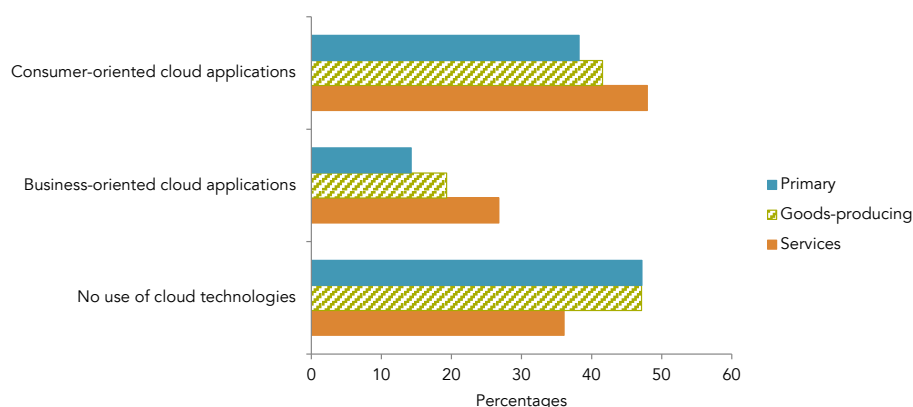
11.3 Adoption of cloud computing in New Zealand

Three surveys provide useful information on the use of cloud computing by New Zealand businesses.

The Commission's 2013 business survey

Sixty-four percent of service businesses that responded to the Commission's business survey reported that they use, or intend to use in the near future, at least one type of cloud computing technology. Consumer-oriented cloud applications are most commonly reported (48%), followed by business-oriented cloud applications (27%). Figure 11.1 breaks this down across sectors. The use of cloud technologies in services-sector firms is higher than for those in the primary and goods-producing sectors. Cloud computing use was more common in service firms based in cities, service firms with an office in more than one location and service firms that recently invested in ICT.

Figure 11.1 Business-reported current or near-future use of cloud computing technologies, 2013



Source: Productivity Commission; Colmar Brunton.

Notes:

1. Respondents were able to report the use of multiple types of cloud technology. Chart based on the responses of 165 primary sector firms, 289 goods-producing sector firms and 1072 services sector firms.
2. Most (62%) users of business-oriented cloud also make use of consumer-oriented cloud.

¹¹⁵ The cost of complementary investments can be as much as 10 times the direct costs of ICT (Chapter 8).

Higher adoption of consumer-oriented cloud applications than business-oriented applications is consistent with the emerging phenomenon of consumer-led technology diffusion. Another example is the “bring your own device” effect, which has seen the use of technology in the workplace increase as employees bring their own devices such as phones and tablets to work, expecting that those devices will inter-operate with workplace ICT systems.

The MYOB Business Monitor September 2013

The MYOB *Business Monitor* (MYOB, 2013) reports a much lower level of cloud computing use (18%) than the Commission’s survey (60%). This could be due to one or both of two factors.

First, MYOB asked about current use, while the Commission’s survey asked about current *and near-future* use. Low current use but high intended near-future use could explain all or part of the difference. Yet the reported slow growth in use (from 14% in May 2012 to 18% in September 2013) is not consistent with high rates of intended near-future use.

Second, the Business Monitor is more strongly weighted towards smaller businesses than the Commission’s survey. In particular, the Business Monitor included sole traders and firms with no employees, while the Commission excluded them.

MYOB reported that most businesses surveyed that used cloud computing benefited by being able to work remotely (55%). Other reported benefits were reduced time spent on IT issues (30%) and reduced IT costs (29%), increased access to new technology (29%), increased security of business data (28%) and improved customer service (28%).

Frost & Sullivan’s State of Cloud Computing New Zealand 2013

Market research firm Frost & Sullivan (2013b) reported on New Zealand organisations’ use of cloud computing:

...of organisations in New Zealand currently using cloud computing services, 47% spend more than 10% of their total IT budget and 32% spend more than 20% of their total IT budget on cloud solutions or services.

...There is a marked increase from 2012’s figures, indicating a growing shift to the cloud.

Organisational understanding of cloud computing is maturing, and interest is observed across all sectors in the New Zealand market, with no one vertical [industry] dominating demand. Software-as-a-Service (SaaS) still accounts for the largest portion of cloud revenues, although the adoption of Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS) has been very strong over the past two to three years.

These trends appear consistent with overseas experiences.

Larger businesses spend more on cloud computing

Frost & Sullivan (2013b) found that in New Zealand:

...larger organisations generally spend more on cloud computing services

SaaS application adoption rates are positively correlated with the size of the organisation...

This finding is consistent with the adoption rates in the Commission and MYOB surveys since the MYOB survey – weighted towards smaller businesses – reported a much lower adoption rate.

The three surveys, taken together, support a conclusion that smaller firms in New Zealand are slower adopters of cloud computing than larger firms. This is inconsistent with the more theoretical proposition earlier in this chapter that smaller firms stand to benefit disproportionately from adopting cloud computing. Other factors, such as the costs of complementary investments or obtaining relevant knowledge, may be discouraging adoption.

F11.5

Small firms in New Zealand appear to be slow adopters of cloud computing, despite its apparent benefits. Other factors, such as the costs of complementary investments or obtaining relevant knowledge, may be discouraging adoption.

Limited knowledge may limit adoption

Porirua City Council (sub. 114) suggests that knowledge may be a barrier to New Zealand firms adopting cloud computing:

The risks and benefits associated with adopting this new technology ... may not be well understood, nor well communicated to individuals and organisations. (p. 3)

Limited information about the risks and benefits of new technology tends to slow its adoption. Such information can be costly to obtain and difficult to communicate (Chapter 9). The visible policies and experiences of organisations have demonstration effects – both positive and negative – that may affect adoption by others.

Government is the largest single consumer of ICT in New Zealand. It is a likely source of demonstration effects, and – to the extent that demonstration effects are important – government ICT adoption is relevant to wider ICT adoption. For this reason the Commission has chosen to examine the Government’s approach to cloud computing.

Government use of cloud computing

Some government agencies such as the Ministry for Primary Industries are strong adopters of New Zealand-hosted IaaS services. Others such as the Department of Conservation have integrated cloud-based services into their operations. Over 400 cloud services such as SurveyMonkey, Boardbooks and Dropbox are in use across government agencies, with more than half of those services hosted offshore (Office of the Minister of Internal Affairs, 2013).

Central government policy on cloud computing has undergone a number of significant revisions over the last five years and guidance for agencies is not fully developed. Policy was interpreted by many to prohibit the storage of data offshore, thus precluding the use of offshore infrastructure. This “prohibition” has been criticised for two reasons:

- the Government was paying too much for cloud services, and the differential will likely increase over time (Bisley, 2013); and
- the Government was sending a poor signal to private firms about how suitable cloud computing is for the ICT needs of private firms (Sapere Research Group and Covec, sub. 105).

Government policy is now clearer following a Cabinet decision in October 2013 and the release of supporting documents in April 2014 (Box 11.5). Agency decisions on cloud computing require case-by-case approval, central government oversight, the completion of a robust risk-assessment process and sign-off by the Department of Internal Affairs (DIA).

Box 11.5 Government policy on cloud computing

The Government established a new cross-agency programme to coordinate and control cloud computing across departments in October 2013. Offshore-hosted cloud became permitted under specific circumstances and agencies were no longer limited to particular types or brands of cloud service.

The new programme directed the Government Chief Information Officer (GCIO) to regulate cloud computing through increased oversight and new assurance processes. This more directive role for the GCIO arose partially in response to public perception of the security and privacy risks of existing (non-cloud) government ICT systems.

The [government ICT] environment has changed significantly since Cabinet made its original cloud decisions in August 2012. This is partly due to well-publicised security and privacy incidents... It is important to note that none of the security or privacy incidents involved cloud computing.

... As a result of these changes, the GCIO is now much better placed to provide guidance, direction and oversight on government cloud computing decisions. The extended mandates and powers provided for the GCIO allow greater visibility and a better understanding of the state of agency information management (including security and privacy) processes (Office of the Minister of Internal Affairs, 2013, p. 5).

Requirements for government cloud computing now include a uniform and robust risk-assessment process, a prohibition on storing high-security data¹¹⁶ on public cloud services, compliance with GCIO assurance processes explicitly targeted at offshore cloud providers, and the retrospective application of all security and risk procedures to cloud services currently in use (Cabinet Minute, 2013).

The cloud computing guidance available to government agencies through the ICT.govt.nz website is almost exclusively about risk management. Agencies must consider 104 privacy- and security-related questions before deploying cloud services (DIA, 2014). No equivalent guidance is available to help agencies assess the benefits of cloud computing.

The DIA indicated to the Commission that the cloud computing programme includes support and assistance for agencies beyond the materials currently online. DIA received positive feedback on the assistance they provide other government departments on planning and implementing cloud computing, including the robust risk assurance processes. The Government has committed to moving 100% of departments' ICT infrastructure to IaaS data centres by the end of 2015 (contractual arrangements permitting) (DIA, 2013).

An overly-expensive risk compliance process can create high hurdles for new projects. Such hurdles rule out cloud projects by small agencies, and small, experimental projects by large agencies. There is little room for learning-by-doing in such an environment. Learning-by-doing is essential to capability building and lowers the risk for future, larger projects.

It is not clear whether the Government's cloud computing policy, as it is currently manifest, does a good job of supporting an informed and balanced response to cloud computing technology. DIA have provided valuable information and support to some government departments, but a small agency or private business seeking central government's view of the risks and benefits of cloud computing would be presented with a one-sided and misleading picture.

The Government should review the visibility of its cloud computing programme and assess how it can provide sound, constructive support to agencies, in line with the GCIO's leadership role. DIA is already assisting some agencies with cloud computing, but it is not possible for the department to reach all potential audiences through individual relationships. Balanced guidance on the opportunities and risks associated with cloud computing should be made available online. Similarly, DIA's knowledge of trustworthy cloud providers and the "lessons learned" from previous and current cloud computing projects should be made more visible and accessible.

R11.1

The Government Chief Information Officer and the Department of Internal Affairs should publicise their capacity and willingness to support government cloud computing and ICT-enabled business change for agencies. The ICT.govt.nz website should provide advice more balanced between benefits and risks, and share the lessons learned from previous and current cloud computing projects.

¹¹⁶ Data classified above "restricted".

Data sovereignty

Data sovereignty is the concept that digital information is subject to the laws and regulations of the country in which it is stored. This introduces additional risks and uncertainties into cloud computing options that involve the storage of data in (or the transit of data through) other countries.

- Foreign government security agencies may have legal means of access to data stored within their jurisdictions.
- Domestic law enforcement may lack efficient mechanisms to obtain evidence or enforce court orders in other jurisdictions.
- Foreign laws or regulation may apply to the data (eg, privacy laws or content restrictions).
- Access to digital data in commercial conflicts will depend upon the discovery rules applicable to the country in which the data is held.
- Domestic laws may restrict what information can be stored offshore.

Companies with operations and customers in multiple countries are already used to dealing with these issues. They are new, however, for domestically-focused companies and for governments.

Making effective use of offshore cloud computing

Rather than solely relying on risk reporting and management to guide agency choices about the most efficient location for their data, DIA should work with the Ministry of Foreign Affairs and Trade to drive the resolution of any data sovereignty, security and privacy issues associated with cloud computing in general and offshore data storage in particular. As well as leading to more efficient outcomes for government, resolution of those issues may also have a significant positive effect on firms' ICT adoption decisions.

Wider regional or multilateral treaties are the ideal way to deal with security and data sovereignty issues. Pending those, the best strategy is bilateral negotiations with the relevant countries. Australia, Singapore and Taiwan should have priority, as these are the closest locations that offer the relevant infrastructure. Of these, Australia is the most important as it offers the lowest latency (section 11.4). Australia has the most compatible regulation and institutions (APC & NZPC, 2012) and Closer Economic Relations (CER) supports the fast resolution of trans-Tasman regulatory issues.

R11.2

The Government should address the data sovereignty, security and privacy risks associated with offshore cloud computing through international negotiations. Bilateral negotiations with Australia could be resolved quickly, so should be pursued as a first step. Resolving such issues will help New Zealand firms adopt cloud computing.

11.4 Barriers to business adoption of cloud computing

This section considers further barriers that might prevent or delay New Zealand service firms from adopting cloud computing. To some extent, these barriers also apply to the adoption of other ICT.

Latency favours Australasian cloud services

Latency is the delay incurred in transporting data over a distance.¹¹⁷ It creates a significant disadvantage for some services to clients in New Zealand who use cloud services hosted outside Australasia (Box 11.6).

¹¹⁷ Long latencies are perceived as slow speeds; yet latency is unrelated to measures of bandwidth typically used as proxies for internet "speed".

Box 11.6 Latency – what is it and when does it become a problem?

People using an online service typically expect an “immediate” response. Slow responses tend to frustrate computer users and waste their time. All else being equal, they will choose a more responsive system rather than a less responsive system.

Data needs to travel both ways to interact with a remote system. Data transport latency is the round-trip time – the time required to transport a request to the remote system and transport the response back.

Latencies of up to about 50 ms (1/20th of a second) are perceived as instantaneous by most people in most situations. Longer delays may – or may not – be acceptable, depending on the specific situation.

Data cannot be transferred faster than the speed of light in a vacuum – about 300 000 km a second. In practice, fibre or copper transmit data at about two-thirds of this speed. So it takes 50 ms for a round trip across a distance of 10 000 km.

Submarine cables do not follow straight lines, so actual round-trip latencies are around 23 ms for Auckland to Sydney and 121 ms for Auckland to California (Southern Cross, 2012b).

Computer users in New Zealand experience latencies that also include processing time on the local remote computers, transport latency in New Zealand and the hosting country, and further delays created by switching equipment or congestion. Only services hosted in New Zealand and eastern Australia can feasibly meet a total latency target of 50 ms. Hosting in South East Asia – for example in Singapore or Taiwan – may be a practical option for services less sensitive to latency.

Cloud services that depend on real-time interaction, such as teleconferencing and virtual desktops, are highly sensitive to latency. Email, calendar, backup and recovery services, on the other hand, are unlikely to be affected. Low latency is particularly important for trading platforms (Williams, 2011). Trade Me highlighted the importance of international latency issues for its infrastructure location decisions:

Due to latency and data transfer delays, Trade Me would currently not contemplate using some international data storage services. “Infrastructure as a service” is something Trade Me would keenly consider if it was available in New Zealand at scale... [Cloud] services allow innovative businesses to deliver products to the market and consumers quickly, but without the high capital outlay or cost. Infrastructure as a service means consumers only pay for the level of demand that they require, and removes the high cost of having to set up a domestic data storage centre, or of purchasing servers and Rackspace domestically. However, due to delays in data transfer internationally, we currently wouldn’t use these services. Even the transfer of data to Australia (the closest country which offers Amazon Web Services), is too slow to contemplate using these services... (Trade Me, sub. 214, pp. 4-5)

PaaS services have arrived late to Australasia

PaaS services are poorly provided in Australasia. Amazon’s Sydney data centre hosts the only major service – and this has only opened in the past year. Google has recently opened its first data centres in Asia – in Singapore and Taiwan (Google, 2013). Microsoft’s closest PaaS data centres are located in Singapore and Hong Kong. Microsoft is likely to open data centres in Australia in the near future¹¹⁸.

PaaS hosting in New Zealand is unlikely in the short or medium term due to the large scale of operation required to make providing these services commercially viable. New Zealand firms can make use of international PaaS services unless regulatory or other barriers prevent them from doing so. NZRise submitted that open source technologies are changing the PaaS environment.

¹¹⁸ Microsoft has announced plans to open data centres in NSW and Victoria towards the end of 2014 (Bowers, 2013).

With open source technologies, such as OpenStack and Ceph, causing massive and rapid disruption, it is the smaller data centres that are able to roll out new services, applying new techniques and technologies at a far faster speed than those that have been built at very large scale. (sub. 209, p. 4)

However others argue that that open source cloud platforms are still at an early stage of development (eg, Buller, 2013).

Regulatory barriers

ICT processes, stores and transports information, and its characteristics and fast rate of change can create challenges for existing regulations and a need for new ones.

Cloud computing further complicates these challenges, as it undermines assumptions about who owns data, and about the location of its production, transport, storage and consumption.

Two broad questions are:

- How does existing regulation, perhaps designed for a different era, work with the cloud?
- How do governments react to the new challenges that the cloud creates?

The Commission has not fully addressed these questions in this report. This subsection covers a subset of relevant issues. Many of these issues are not specific to cloud computing; however cloud computing increases their importance.

Cloud computing raises significant issues for the owners of data – around security (unauthorised access or modification), reliability, switching (costs of moving to another provider) and control (such as access to data in the case of supplier bankruptcy). These issues create costs that deter individuals and firms adopting cloud computing.

Data security

Security is very important for data owners:

Security is the most important criteria when selecting a cloud vendor, followed by reputation, trust, service and reliable support, price and ROI [return on investment] success. Vendors must also have sufficient SLAs [service level agreements], offer sufficient product scalability and offer a range of value added services. (Frost & Sullivan, 2013b)

There are many aspects to data security. Data owners want to be able to determine who has access to their data and under what conditions. They want to access it (for their own use) wherever and whenever they determine. They want it protected against malicious (or inadvertent) access, modification or deletion. They want it reliably backed up. And, at times, they want to be able to erase it beyond recovery.

Many of these matters are properly the business of data owners and service providers, and most appropriately resolved by mutual agreement.

Malicious cyber security threats do not respect borders. Notions that in-house is “safer” than onshore, which in turn is “safer” than offshore, are outdated. Large-scale cloud providers can afford specialised security experts, and may be better placed to deal with security threats by responding to the aggregate security needs of many customers and providing 24/7 response capability (Gupta, Seetharaman & Raj, 2013).

Regulating for data security

Government advice and rules on data storage are becoming out of date with the advent of cloud computing. For example, the Privacy Commissioner’s guidance on the storage and security of health information does not consider the possibility that such data might be secured electronically on premises owned by a third party. While the guidance does contemplate health information being held on computers and accessed through mobile devices, it nevertheless advises users to “keep... health information, whether paper records, computer disks or tapes, on the agency’s premises where possible” (2008, p. 31). Such

advice, based on an older notion of information storage, is likely to limit the innovative use of cloud computing to improve productivity.

Privacy

Privacy is a more subtle aspect of data security. Privacy issues can arise because of the *way* information is used, *who* makes use of it, or what other information is *combined* with it, rather than publication in itself.

Such aspects are a challenge to regulate. As data flows across borders, regulatory responses may need to be international to be fully effective.

The New Zealand Law Commission, in a recent review of privacy law, recognised that advances in information, communication and surveillance technologies have created and intensified many privacy issues (NZLC, 2011). The NZLC concluded that:

On the whole, we think that the privacy principles and the Privacy Commissioner's current functions and powers are adequate and sufficiently flexible to respond to the challenges posed by new technologies. Nevertheless, that landscape is dynamic and will need to be kept under regular review to ensure that this remains the case. (NZLC, 2011, p. 250)

Privacy is one of many ICT-related issues that have become the normal business of government. It is important for good policy making that governments take an integrated view of ICT policy and regulatory issues (Chapter 9).

Access to data by security agencies

Government interests overlap and to some extent conflict with the needs of data owners. For example, governments need access to private data to enforce some laws:

[The] Government is currently considering lawful interception requirements for communications services. That policy process needs to properly consider the issues and implications for remotely hosted Cloud services. Further, clarity around the firm's data storage obligations and opportunities would likely give firms further confidence to use cloud based services. (Telecom, sub. 16, p. 3)

The New Zealand Council of Trade Unions (CTU) submitted:

A significant barrier to the use of cloud computing based overseas is the national security apparatus in those countries. In particular, recent leaks and revelations about the eavesdropping and potential interference with the data of foreign nationals by the NSA in the US and GCHQ in the UK, along with US intrusive laws empowering authorities to demand personal information from telecommunications providers, will leave a feeling of intense uneasiness among many users. Privacy and freedom of speech are issues of real concern. (sub. 205, p. 19)

A critical examination of United States and European Union law indicates that simply avoiding US-based cloud service providers will not necessarily increase the security of online information. The PATRIOT Act allows the US Government access to digital information held by US or US-subsidary firms, stored in US-based data centres or possessed by any cloud provider with "continuous and systematic" contacts with the United States (Billings, 2012). The US Government, through the PATRIOT Act and other security-related legislation, has far-reaching powers to obtain data from users of the cloud, regardless of location (van Hoboken, Ambak & Eijk, 2012). Merely selecting a non-US based cloud provider does not guarantee that data will be outside the scope of the PATRIOT Act.

Digital surveillance by governments – domestic and foreign – is a reality, and not technically limited by borders. Consumers need to carefully choose what data they store on internet-connected systems. Surveillance is bound to have some inhibiting effect on use of the internet. It is important that governments strike an appropriate balance between too little and too much surveillance.

Digital content

Much legislation focuses on content, for example bullying, defamation, pornography, advertising and film classification. In the past such legislation was often specific to particular media types. These distinctions continue. For example, a complaint against a television programme is considered differently depending on whether it was broadcast over the television network or accessed online (NZLC, 2013). The process of

“digital convergence”, where most content has become digitised and the lines between different media increasingly blurred, has made such distinctions less than helpful.

F11.6

The process of “digital convergence”, where most content is digitised and the lines between different media are increasingly blurred, has made legislation specific to particular media types outdated.

Similarly, copyright laws aim to balance the interests of content producers with those of content consumers. There are some open questions about whether New Zealand’s current approach to copyright has the exceptions and fair use/dealing provisions to stimulate innovation and collaboration.

Law enforcement

The internet has proved a challenge for national legal systems since it became widespread in the 1990s. The internet and the services it supports raise many questions; for example, whose laws apply to website content created in one country, stored in a second and accessed in a third?

These considerations are important for national governments. For example, search warrants and restraining orders must be effective to enforce laws. One possible response by governments is to insist on *data localisation* – rules that require data to be stored within national borders.

...data localization laws would require that businesses that operate on the Internet – including Internet service providers, companies with data operations, and cloud services that control and maintain digital data for business and individuals, including redundant backups – store that data within the country where the businesses are located, rather than on servers in other countries. (Vogel, 2014)

A 2013 Brazilian internet regulation bill included a data localisation requirement – companies would need to keep within the country any data pertaining to Brazilian users. This requirement was recently dropped from the bill (Grande, 2014).

The European Centre for International Political Economy (ECIPE) has proposed a Mutual Legal Assistance Protocol to set rules (with safeguards) for law enforcement requests for information – combined with rules restricting data localisation (Lee-Makiyama, 2013). ECIPE argues that “improved law enforcement removes the only legitimate argument for countries to demand greater access to data through localisation rules”.

Regulation in the digital era

Developing a conducive and stable environment for international cloud computing will require coordinated action by governments and the ICT industry:

In such an innovative environment, it is more likely that collaborative efforts by regulators and industry participants, directed to harmonisation of treatment between countries, will be an important strategy in providing more stable arrangements for global cloud providers. Such cross-border strategies are also likely to adopt a range of interrelated tools, including regulation, education programs for consumers and industry, and technology-based approaches such as technical standards development. The ACMA’s experience with other global communications issues, such as unsolicited communications, indicates that a multifaceted approach can yield positive results for industry and consumers in managing digital data across national borders. (Australian Communications and Media Authority, 2013, p. 20)

Cloud computing has made questions about data location harder to answer. In a real sense, data in the cloud is stored “everywhere and nowhere”. Flexibility over where data is stored and processed allows cloud computing service providers to be more efficient and reliable – and ultimately to provide services at lower prices for their customers. Restrictions on where data is stored or the free flow of data between countries may be costly for those affected. Inappropriate or mismatched regulation is one of the greatest threats to cloud computing adoption:

Perhaps the biggest factor that will impede the adoption of the cloud computing paradigm is regulation at the local, national, and international level. Regulation can range from data privacy and data access to audit requirements and data location requirements. When corporate data are moved to

the cloud, regulations... with their defined requirements for physical data audit will come into play. Such and other requirements at the local, national and international level (e.g. many nations have laws requiring SaaS providers to keep customer data and copyrighted material within national boundaries) might negate many [of] the benefits of cloud computing. (Marston et al., 2011, p. 182)

From an efficiency perspective, governments face a challenge of letting data flow freely across national borders without impeding the ability of each nation to enforce its laws. On the other hand, national laws may be ineffective without international cooperation. Governments need to be realistic about the limits of their ability to control outcomes via regulation, and cognisant of the trade-offs inherent in regulatory approaches.

The Government should prioritise international negotiations on internet issues. The free flow of data is a trade issue for this century. Restrictions on data flows will have a disproportionately negative effect on smaller countries such as New Zealand, as they lack the scale to support a wide range of sophisticated, home-grown, digital services.

F11.7

Free trade agreements are likely to have an increasing focus on “free trade in data”. Governments face a challenge of letting data flow freely across national borders without impeding the ability of each nation to enforce its laws.

F11.8

Restrictions on data flows will have a disproportionately negative effect on smaller countries such as New Zealand, as they lack the scale to support a wide range of sophisticated, home-grown, digital services.

R11.3

The Government should give priority in international trade negotiations to internet issues.

The Government should pursue free-trade-in-data agreements with other countries. A reasonable aim of such agreements should be that the rights and responsibilities of data owners and consumers are indifferent to the physical location of data.

Transfer pricing and tax evasion

Services traded across national borders are a challenge for countries seeking to maintain their tax base and minimise economic distortions. This is especially the case for digital services because concepts of country of origin and country of consumption are becoming blurred, and because service flows across national borders are difficult to monitor. The widespread adoption of cloud computing make these challenges harder.

... cloud computing (like other technological changes) is not always compatible with current rules for taxing activities in multiple jurisdictions. Therefore, tax fairness may require that new standards be used to allocate income among jurisdictions. (Shakow, 2013, p. 2)

For example, unequal treatment of goods and services tax (GST) on foreign purchases can reduce domestic tax receipts and disadvantage domestic retailers (Box 11.7).

Box 11.7 Unequal GST treatment of online purchases

Consumers are increasingly expecting a multi-channel service delivery where online and in-store functions are seamlessly interwoven; they can access products online from in-home, in-store and mobile devices, and can use, for example, social media and group buying sites to buy products (New Zealand Retailers Association, 2011; Frost & Sullivan, 2012).

New Zealand retailers have raised the issue of goods purchased online from abroad not attracting GST. New Zealand retailers charge 15% GST on all domestic transactions. Customs generally do not

collect GST on imported goods consignments with a value of less than \$400. The number of consignments with a value of less than \$400 has risen sharply with the rise of direct-to-consumer online sales. New Zealand online retailers, as well as traditional retailers, cannot match international prices, all other things (such as scale economies, freight costs and margins) being equal.

New Zealand consumers benefit from the increased choice and competition that foreign online retailers provide. Yet differential tax treatment distorts consumer choices against domestic retailers.

The Government announced in May 2013 that it would issue a discussion document on GST and online shopping. It decided in late 2013 to delay release of the document, pending a study of wider cross-border tax issues and how other countries tax online sales.

The OECD's base erosion and profit shifting initiative identifies specific challenges associated with taxing digital services:

The spread of the digital economy also poses challenges for international taxation. The digital economy is characterised by an unparalleled reliance on intangible assets, the massive use of data (notably personal data), the widespread adoption of multi-sided business models capturing value from externalities generated by free products, and the difficulty of determining the jurisdiction in which value creation occurs. This raises fundamental questions as to how enterprises in the digital economy add value and make their profits, and how the digital economy relates to the concepts of source and residence or the characterisation of income for tax purposes. (OECD, 2013e, p. 10)

Transfer pricing – moving profits to low-taxing jurisdictions – has long been an issue for governments. Working out where an internet advertising company makes its profits is much harder than in the case of an oil company, which used to be the type of company associated with transfer pricing. These issues will not be easy to resolve and may rely on the actions of consumers (Dominion Post, 2014) as well as the unilateral and multilateral actions of governments.

A specific challenge is how to appropriately tax the profits of international digital service providers earned in the New Zealand market without prompting them to avoid all local liability by relocating to offshore tax or data havens.¹¹⁹ Consequences of such relocation could be not only lost potential tax revenue but also poor quality of service (due to increased latency), increased data transport costs, and a reduced ability to apply New Zealand law to digital content. Three inquiry participants submitted on the importance and complexity of taxation and transfer pricing rules:

We agree with the Commission's concerns regarding transfer pricing and tax evasion, emphasising that it is not unique to the IT industry. We have noted the potential conflict between freedom of data flows and effective tax collection... We also agree that an effective response requires international action by multiple governments and hence support recommendation R9.3 though we would extend it to activities beyond 'digital services'. However international action may be slow in coming and less than effective. Authorities in New Zealand should also be seeking effective actions they can take unilaterally or in partnership with key countries that are willing. (CTU, sub. 205, p. 19)

The Group supports the recommendation [R11.4] that New Zealand should participate in international forums on what is frequently referred to as "Base Erosion and Profit Shifting" ("BEPS"). The Group has taken an active role in discussing and providing input to Officials in this regard. However, the nature of the Commission's concerns and its relationship to productivity in the services sector could be further articulated. (Corporate Taxpayers Group, sub. 206, p. 3)

We agree with the recommendation that the New Zealand Government should fully engage with the OECD but we are strongly of the view that it must proceed with caution with regard to its responses to specific BEPS issues. (New Zealand Institute of Chartered Accountants, sub. 207, p. 5)

¹¹⁹ A "data haven" in this context is a jurisdiction with relatively unrestrictive laws about data content and that does not support enforcing the laws of other countries.

KPMG submitted that there is no “one size fits all” solution to international tax issues, and the New Zealand Government needs to carefully balance a number of considerations before determining its response to profit shifting:

It is unclear to us that base erosion and profit shifting (“BEPS”) contributes to productivity problems (such as poor quality of service and higher costs) in the New Zealand digital services sector. It is further unclear that implementing recommendations to address BEPS issues will solve those productivity concerns, if in fact productivity is a problem. The Commission should confirm that it has identified a real issue before proceeding with its recommendation. (KPMG, sub. 215, p. 1)

The failure to collect tax from some service suppliers means higher taxes on others, leading to increased market distortions and higher deadweight losses. These will to some degree impact services-sector productivity.

Solutions are most likely to involve coordinated action by multiple governments. This makes it important for New Zealand to participate in multilateral initiatives.

R11.4

New Zealand should promote – and participate in – international forums with the aim of reducing the ability of multi-national firms providing digital services to shift their profits across national borders to avoid paying tax.

12 Overall assessment

Key points

- The services sector is large, diverse and interlinked with the rest of the economy.
- Services-sector productivity performance is below OECD averages.
- The services sector is growing as a proportion of the economy – a pattern that is typical across countries as living standards rise.
- The intensity of competition tends to be low in service markets. Reasons include that service transactions tend to be complex and information-intensive, and services are difficult to trade over distance. Empowering consumers can help stimulate competition.
- ICT is driving a revolution in services. ICT has high potential to boost productivity, particularly in service industries. However, New Zealand has not received the same boost from ICT as some other countries.
- Reallocation – putting assets to more productive uses – is the single largest contributor to productivity growth. It operates across firms, industries and regions. Barriers to reallocation slow productivity growth.
- Five strong themes emerged during the inquiry. To boost productivity in the services sector, policy makers need to be mindful that:
 - internationalisation expands markets and stimulates competition;
 - success requires new skills and the flexibility to adjust;
 - experimentation fosters innovation;
 - quality regulation and institutions underpin well-functioning, efficient markets; and
 - the Government is an important player, as a service supplier and customer.
- The recommendations in this report, if implemented effectively, would make a significant contribution to lifting the sector's productivity, and to New Zealand's overall economic performance.

The services sector is large and important to the New Zealand economy. This inquiry was motivated by concerns that the sector was relatively understudied and potentially underperforming.

The terms of reference directed the Commission to provide a high-level assessment of the sector and then to dive deep into specific topics, seeking concrete recommendations to boost productivity. The Commission's chosen topics – competition and ICT – further informed its high-level assessment. This chapter summarises that assessment, setting out the major insights and messages from the inquiry.

One important insight is that the services sector is deeply intertwined with the rest of the economy. So, generally speaking, services-sector policy is not separable from wider economic policy (Chapter 2). Many of the policies that boost productivity in the services sector will necessarily affect other sectors. The Commission has not studied those wider effects as part of this inquiry. However, the perspectives presented and the approaches advocated in this report are compatible with the Commission's wider research on the problems faced by the New Zealand economy and what is required to sustainably boost its performance (Conway & Meehan, 2013; de Serres, Yashiro, & Boulhol, 2014).

Another important insight is that technological changes – particularly in ICT – have high potential to boost productivity. Yet they are disruptive. They create a high degree of uncertainty about future investment and employment patterns. An underlying message is that boosting productivity in the services sector requires more than just Government and firms undertaking some specific actions. It requires New Zealanders to think differently about the sector, how it is changing and what is needed to thrive in the midst of uncertainty.

12.1 The role and performance of the services sector

The sector is large, diverse and interlinked with the rest of the economy

New Zealand's economy, like most OECD countries, has become services-based. Services now account for around 70% of GDP and the sector's share of employment is even larger. In some high-income OECD countries services are now approaching 80% of GDP.

Service industries are diverse in their features and performance. Some are made up of small and dispersed businesses largely serving local markets. Others comprise large and sophisticated businesses serving the national and international markets. This diversity seems to defy generalisation, but broad observations are both possible and useful.

The sector is highly interlinked with the rest of the economy, providing intermediate inputs to primary and goods producers who – taken together and on average – spend around 40% more on services than they do on wages and salaries. Services are also a major input into the production of other services.

Directly-traded services contribute about 22% of New Zealand's exports. While this proportion is comparable to other OECD economies, New Zealand's exports as a proportion of GDP are low compared to countries of similar size. Growth in direct service exports from New Zealand is lagging behind global growth, particularly in high-value, knowledge-based services.

Productivity performance is below OECD averages

New Zealand's overall labour productivity has been below the OECD average since the 1970s and shows few signs of catching up. The services sector is an integral part of this continuing gap. Productivity growth rates of service industries since the mid-1990s – both labour productivity and multi-factor productivity (MFP) – have mostly been below OECD averages. Productivity levels and growth rates differ considerably between service industries (Chapter 3).

Services productivity matters for a country's economic performance. Most of the difference in aggregate productivity growth between developed countries can be explained by differences in the performance of their services sectors.

The intensity of competition tends to be low in service markets

Competitive pressure is a significant driver of innovation and productivity growth (Chapter 5).

The local nature of many service products limits the extent of markets. New Zealand has a small population distributed across a relatively large land area, so the opportunities to benefit from competition and scale in these local service markets are fewer than in more densely populated countries. This is likely to reduce the incentives for firms to invest in new technologies and business models, and thereby hold back productivity performance.

New Zealand's remoteness inhibits competition from imported services, weakening the incentives for local service firms to raise their productivity towards the international frontier. Inward foreign direct investment can create competitive pressure, and has occurred in, for example, the information, media and telecommunications, and the finance and insurance industries, with apparently beneficial impacts on productivity.

Indicators of the intensity of competition suggest that competition, which should encourage well-performing firms to expand and poorly-performing firms to exit, is relatively subdued in some of New Zealand's service industries.

New Zealand has not received the same boost from ICT as some other countries

New Zealand has not achieved the boost to its overall productivity from ICT-using service industries that happened in the United States, Australia and some other OECD economies from the mid-1990s (Chapter 8).

Rapid developments in ICT have enabled new services and transformed existing ones, including in communications, media, entertainment and education. ICT-intensive service industries have the potential to achieve impressive productivity performance. This potential appears only partly realised in New Zealand. In some industries the changes were sufficiently strong and pervasive to show up in industry productivity figures. But in other service industries with potential for ICT-supported productivity improvements, such as the wholesale and retail industries, productivity performance has lagged behind other countries (Chapter 3).

ICT creates opportunities to boost productivity, and is reducing the difficulties that some New Zealand industries have faced because of the small scale of local markets and their remoteness from export markets. It has made some types of services more easily traded and provides New Zealand entrepreneurs with opportunities to expand exports of “weightless” products. Accounting software firm Xero is an example.

Comparative data on ICT investments per capita and industry-level comparisons suggest, however, that New Zealand firms are relatively slow adopters of ICT (Chapter 9). This may be partly because of weak competitive pressures. Some firms face difficulties in attracting capital for ICT investments that are seen as risky. New Zealand is also affected by a worldwide shortage of ICT professionals, and may lack ICT-savvy managers (Chapter 10).

Faster adoption of ICT and associated organisational change has the potential to significantly improve the productivity of the services sector.

There is no evidence that New Zealand firms are making systematically poor choices about ICT adoption (Chapter 9). Indeed, they appear to be reacting sensibly to their perceptions of the costs, benefits and risks of ICT adoption, within their overall environment. Many factors influence this environment including geography, regulations, and the behaviour of investors, suppliers, competitors and customers. Government actions influence this environment, and the Commission believes that policy changes could make this environment more conducive to faster ICT adoption.

12.2 How should policy makers think about the sector?

An economy dominated by services is typical as living standards rise

The services sector is the largest sector of the New Zealand economy, and its share of the economy continues to grow. This pattern of economic development is typical across countries as living standards rise.

The services sector contains a mix of low and high productivity industries. Differing growth rates will affect aggregate productivity, either positively or negatively. Concerns that a shift of employment to and among service industries has led to slower aggregate productivity growth appear largely unfounded in the case of New Zealand over the past three decades (Chapter 4).

Firms in the services sector, in general, are less exposed to the competitive pressure that drives productivity growth than are firms in the other sectors. So a growing share of services creates a risk of reduced competitive pressure and productivity growth in aggregate. This makes pro-competitive policies in service markets all the more important.

More than half of New Zealand’s exports are services

Service exporters typically need deeper connections, better information and better networks than goods exporters. Meeting these needs is difficult and costly. One efficient response is to use exported goods as “containers” for services. Indeed, more than half of the value of New Zealand’s exports can be attributed to inputs from the services sector, when the contribution of services to exported goods is recognised.

Service transactions tend to be complex and information-intensive

Service transactions commonly involve higher transaction costs than goods transactions for reasons including that the contracts, explicit or implicit, tend to be more complex (Chapter 2). A further reason is that information asymmetries – when sellers and buyers have different information – can be more pronounced in service transactions. Problems can arise due to difficulties in assessing service quality before or after purchase, and in obtaining remedies for poor service quality.

Empowering consumers can help drive competition

Competition policy often focuses on the supply side – the number of competitors and their behaviour in the market. The demand side is also important. Confident and well-informed consumers support the competitive process. By seeking the best value, they advance their own interests and provide signals to suppliers on favoured product characteristics. Competition between suppliers who respond to these signals can lead to lower costs, improved quality, greater innovation and higher productivity.

Search costs (ie, finding a preferred supplier) and switching costs (ie, changing suppliers) are particularly pronounced in some service markets. These costs can reduce competition by making it difficult for consumers to compare different service providers and respond to price and quality signals (Chapter 6).

ICT is assisting service consumers by lowering the cost of providing rich and comprehensive information about service suppliers and their products. Comparison websites, for example, allow consumers to make more informed choices about complex service products.

ICT is driving a revolution in services

ICT underlies a revolution in services. ICT has unlocked economies of scale in many existing services and is creating new services similar to the way in which other general purpose technologies, such as steam and electricity, transformed manufacturing and agriculture. Extending this analogy, ICT is the “steam engine” of services.

Importantly, scale in demand (ie, larger service markets) is required to take full advantage of the economies of scale in production offered by ICT.

ICT is disruptive. Its effects across the economy are pervasive and impact service industries significantly. Some ICT-driven changes will go in New Zealand’s favour; for example, cloud computing is enabling New Zealand digital service exporters to access foreign ICT infrastructure at the same price as their foreign competitors (Chapter 11). But other ICT-driven changes are less favourable; for example, New Zealand is a poor location for international data centres because its remoteness slows data transfers (Chapter 2).

The effects of specific ICTs and their interactions are hard to determine in advance. Firms, industries and countries will be better off if they can adapt quickly, and at lower cost, to this disruption.

Countries face choices of policies and institutions that influence the way they respond to, and take advantage of, the ICT revolution. These choices are best made in a thoughtful and informed way, to avoid the risk of an uncoordinated set of policies and institutions, which work against each other and dissipate potential gains.

Barriers to reallocation slow productivity growth

Change – in all its forms – involves reallocating resources to new uses. Markets signal changes in value, and provide incentives for resources to shift, through changes in prices. The reassignment of affected resources – including land and financial, human and physical capital – to their (new) most productive use drives allocative and dynamic efficiency.

This reallocation – putting assets to more productive uses – is the single largest contributor to productivity growth. It operates across firms, industries and regions. Adjustment costs – the costs incurred in redeploying devalued assets – discourage reallocation. Policies aimed at reducing adjustment costs can contribute to productivity growth (Chapter 8).

Growth and productivity enhancement require change. So New Zealand needs to find ways to facilitate change in order to encourage growth and productivity. The human aspects of change are the most challenging, so reducing costs and creating opportunities for those affected by change is a key requirement for facilitating growth.

12.3 Boosting productivity in the services sector

The actions of firms and individuals will drive productivity improvements in New Zealand's services sector. However, they will be more likely to succeed where Government provides a supportive policy environment.

Services sector policy should not be considered in isolation. Service firms share inputs (including labour, capital and land) with the other firms in the economy. And the outputs of service firms are largely consumed by other firms. The policies that make the most difference to services-sector productivity will likely also have significant effects on firms in the other sectors.

During this inquiry, the Commission identified five themes relating to boosting productivity in the services sector. The Government should keep these themes in mind in all relevant policy making in order to maximise services-sector productivity.

Theme 1 – internationalisation expands markets and stimulates competition

New Zealand has small domestic markets and is geographically distant from larger markets. The consequences for New Zealand may be getting worse rather than better over time: "there are major advantages associated with industrial clustering and agglomeration for high knowledge-intensive and high value-added activities, and [...] the geographical concentration of these types of activities is becoming ever more important" (McCann, 2009, p. 293).

One challenge for policy makers is to reduce the effects of borders. This would provide New Zealand-based firms access to larger markets, and promote greater competition in domestic markets. It also helps New Zealand production to become enmeshed in international supply chains.

Lowering the cost of access to international markets will make an important contribution towards New Zealand firms achieving the benefits of scale in production available to firms in countries with large domestic markets and to those firms currently exporting.

Internationalisation requires policy attention to the free flow of goods, services, capital, skills, data, ideas and technologies.

The general world context is one of increasing specialisation and cross-border trade of intermediate inputs – there are potentially unattractive consequences for New Zealand should it go against those trends. For example, New Zealand markets will get smaller if regulatory settings have the effect of creating a digital border. Conversely, becoming more integrated into global production will expand markets and stimulate the diffusion of new technologies and ideas into the New Zealand economy.

Theme 2 – success requires new skills and the flexibility to adjust

Adoption and effective use of ICT is very important to boost productivity in service firms. Getting the most out of ICT involves complementary investments, including business reorganisation, staff training and management skills.

Important factors that influence the optimum adoption time for firms include access to capital, information diffusion, and ICT technical and managerial skills (Chapter 9).

Firms will not invest if the overall business case is negative. Adjustment costs can be a big item on the negative side. Adjustment costs fall on investors, employees and managers and they influence decision making. It is important that policy settings do not inflate adjustment costs.

Firms need to have the flexibility to adjust to get the most out of ICT. The regulatory environment has a strong influence on such flexibility. Other regulatory objectives need to be balanced so that sufficient weight is given to the effects on ICT adoption and productivity growth

Responding to the ICT revolution presents two particular challenges: how to raise the levels of relevant skills and experience; and how to reduce adjustment costs for firms and employees. Current labour market and educational institutions reflect historical experience, but may not be a good match to future needs (Chapter 10).

Should the labour market changes from the ICT revolution prove to be as disruptive as many commentators are predicting, New Zealand and other countries will need to make major modifications to labour market institutions. To be successful, institutions will need to both facilitate change and support people through it.

Theme 3 – experimentation fosters innovation

The disruptive nature of ICT makes planning for change difficult and unreliable. It favours businesses that are flexible and experiment. Trying many approaches, while retaining the flexibility to quickly back out of unsuccessful ones, is a more likely path to success. Policy needs to allow firms the flexibility to adjust to emerging technology possibilities.

Experimentation is fundamental to innovation in an environment with high uncertainty (Chapter 8). Existing and large businesses are well-suited to some forms of innovation, particularly that required for the incremental improvement of existing technologies. More disruptive innovation, for example finding new highly-productive business models, typically emerges from competition between young firms pursuing different business models.

Policy that is overly prescriptive about business models or market boundaries, or imposes high exit costs on firms can discourage disruptive innovation.

Theme 4 – quality regulation and institutions underpin well-functioning, efficient markets

New Zealand's policy settings generally rate well according to OECD measures. However, New Zealand faces challenges that many other countries do not, such as the economy's small size and remoteness. This means that it needs to have particularly good framework policies that address these challenges.

Many service markets are highly regulated, stemming partly from issues such as information asymmetries that are common in services (Chapter 2). However, regulation is not costless. Poorly designed or unnecessarily complex regulation can have negative effects on suppliers, consumers and sometimes both. It can restrain innovation or alternatively may be exploited by incumbent firms to reduce competition. The Commission's inquiry into regulatory institutions and practices, which has been undertaken in parallel with this inquiry, is identifying ways in which regulation can be designed and implemented so as to avoid these problems.

Government needs to ensure that the public institutions, such as competition law, that underpin market competition and market transactions are of high quality. It needs to keep seeking improvements rather than adopting a set-and-forget approach (Chapter 7).

The specific characteristics of ICT create special challenges for competition regulators. The targets of anti-monopolisation legislation in the United States and Europe are increasingly ICT firms, rather than the railroads and public utilities for which that legislation was designed.

Theme 5 – government is an important player

The government sector is a large part of the economy. As well as regulation, the Government interacts with the market services sector through taxation and spending. The Government is a significant provider of infrastructure and source of investment capital.

Government decisions about what it supplies and what it purchases have direct and indirect influences on markets (Chapter 11). These effects can be both positive and negative. Government-provided services were excluded from the terms of reference for this inquiry. However, they are growing, and the scope for productivity improvement is large. New methods of supply, including through the use of ICT, are likely to be very relevant to improving wider services-sector efficiency.

12.4 Implementation

Implementation will only happen if someone is accountable for it. In other inquiry reports the Commission has suggested new institutions or ministers to ensure implementation. In this case, there does not seem to be an institutional or ministerial gap.

It would not be useful to have a “Minister for Services”. Many of the recommendations in this report do not apply specifically to services. This is not surprising, given that competition and ICT are economy-wide issues. Rather, responsibilities for implementation are spread across the Government.

To encourage implementation, when the Government develops its response to this report, it should nominate a point of accountability for each recommendation that it accepts. It should also develop a work program, and monitor progress against the work program. Progress should be reported to Cabinet periodically.

The Commission has chosen a “top ten” from its recommendations to assist the Government in prioritising its implementation (Table 12.1). The selection is based on the Commission’s subjective judgement of which recommendations will yield the largest net benefits if adopted. The top ten list is not intended to suggest that the remaining recommendations are unimportant, nor that their implementation should be delayed. Indeed, many of those recommendations are better suited to early implementation and modest but quick results.

Table 12.1 Top ten recommendations

	Recommendation	Themes
R5.1	The Government should complete the implementation of the recommendations for reducing trans-Tasman barriers to trade in services made in the Commission’s 2012 joint study with the Australian Productivity Commission, and build on them by reducing barriers to international trade in services with other countries.	1, 2, 3, 4
R5.2	The Government should mandate the recognition of foreign licenses to practice when those licences are based on equivalent or better standards than the corresponding New Zealand standards.	1, 2
R6.9	When the Government gives statutory recognition to professional bodies, it should be explicit in legislation about its expectations of those bodies, including their approach to competency standards (both entry and ongoing) and their approach to complaints resolution and reporting. When the Government gives statutory recognition to professional bodies, it should require that the governing boards of professional bodies include members from outside the profession, and members knowledgeable about consumer perspectives. Also, the promotion of competition should be included in the statutory objectives of the professional body.	2, 4
R7.1	The Government should review section 36 of the Commerce Act 1986 and its interpretation. The review should consider whether other approaches offer greater accuracy in identifying situations where firms have taken advantage of market power and damaged dynamic efficiency with consequent detriments to competition, innovation and/or productivity.	2, 4
R7.5	The Commerce Commission should be able to undertake studies on competition in any specific market in the economy. To enable this, the Commerce Act 1986 should be amended to include a provision similar to s 9A (1) (b) of the Telecommunications Act 2001.	4
R9.1	The Ministry of Business, Innovation and Employment, when next reviewing the KiwiSaver Act 2006 or within three years, should consider options to make it easier for KiwiSaver providers to invest in private equity and venture capital.	2, 3, 4
R9.2	As a matter of promoting good policy advice, the Treasury, the State Services Commission and the Department of Prime Minister and Cabinet should ensure that the design of regulation that significantly affects the adoption of ICT by firms takes comprehensive account of costs and benefits.	2, 4, 5

	Recommendation	Themes
R9.4	The Treasury, the State Services Commission and the Department of Prime Minister and Cabinet, working together with the Government Chief Information Officer, should agree on and mandate a means to ensure that significant government ICT projects are evaluated and reviewed and the results disseminated both within government and more widely.	2, 3, 4, 5
R10.2	The Ministry of Education and the Tertiary Education Commission should continue to work with tertiary education providers to make information available on student employment outcomes by tertiary education provider, qualification and, where numbers are sufficient, by field of study. Once a robust information system is in place, the Ministry should regularly publish information on student outcomes by tertiary provider to help intending students with their choices.	2, 3, 5
R11.2	The Government should address the data sovereignty, security and privacy risks associated with offshore cloud computing through international negotiations. Bilateral negotiations with Australia could be resolved quickly, so should be pursued as a first step. Resolving such issues will help New Zealand firms adopt cloud computing.	1, 2, 3, 4, 5

Findings and recommendations

Chapter 2 – Understanding services

Findings

F2.1

Spatial transaction costs – the extra costs incurred because production and customers are not co-located – are often higher for services than for goods. High spatial transaction costs can lead to localised service markets. Competition regulators may need to strike a balance between competition and economies of scale in production in these markets.

F2.2

Information asymmetries can be more pronounced in service transactions than goods transactions due to the difficulties in assessing service quality before or after purchase. Information asymmetries, together with the risk of adverse consequences for customers and the public, and difficulties in obtaining remedies for poor service quality, prompt governments towards extensive regulation of many services.

F2.3

The services sector is highly intertwined with the primary and goods sectors. Policy development should recognise this interdependence between the three sectors.

Chapter 3 – Productivity performance

Findings

F3.1

The level and rate of growth of labour productivity in New Zealand have been below the OECD average since the mid-1970s.

F3.2

The productivity performance of New Zealand service industries is diverse. Service industries are among the most and least productive in the economy in terms of both levels and growth rates of labour productivity.

F3.3

Industry variations in labour productivity levels reflect differences in capital intensity as well as in multi-factor productivity (MFP). Service industries that invest in and use information and communications technologies (ICT) intensively (such as information media and telecommunications, and finance and insurance) have considerably higher labour productivity levels, skill requirements and wages.

F3.4

The distributive and person-centred service industries generally have low output for each hour paid, have experienced low labour productivity growth, and employ less-skilled people.

F3.5

Both MFP growth and capital deepening contributed to labour productivity growth across service industries between 1990 and 2012. MFP growth was generally the more variable and significant of the two.

F3.6

New Zealand's non-inclusion in the OECD's industry productivity database limits opportunities for research that would yield evidence and insights of benefit to New Zealand.

F3.7

Labour productivity growth has been slower in more than half of New Zealand's service industries, compared with their counterparts in Australia and the United Kingdom.

F3.8

There is significant variation industry by industry in productivity growth rates and levels compared with other OECD countries. But the general picture is in line with New Zealand's relatively poor productivity performance observed at the economy-wide level.

F3.9

New Zealand's service industries generally had relatively weak MFP growth compared with OECD countries between 2000 and 2007. MFP tended to be a greater contributor than capital intensity to New Zealand's labour productivity differences in service industries – in both growth rates and levels – compared with other OECD countries.

F3.10

The information media and telecommunications industry was an exceptionally good performer in having high levels and growth rates of labour productivity and MFP growth both relative to other industries in New Zealand, and to its Australian counterpart industry, from 1997 to 2010.

F3.11

The available evidence suggests that New Zealand's distributive service industries have underperformed relative to other OECD countries.

F3.12

Weaker productivity performance in New Zealand's services sector has contributed significantly to New Zealand's lack of progress towards closing its aggregate productivity gap with Australia and other leading OECD countries.

Recommendations

R3.1

Statistics New Zealand should work with the OECD to include New Zealand in the OECD industry productivity database.

Chapter 4 – The contribution of services to the New Zealand economy

Findings

F4.1

The services sector is tightly linked to the rest of the economy. There is a complex web of services that are inputs to the production of goods, and goods that are inputs to the production of services. This web interconnects the primary, goods-producing and services sectors.

F4.2

Nearly half of the outputs of the services sector are purchased by firms for use as inputs to their production. Firms purchase more services than households.

F4.3

The way that service industries are integrated into the New Zealand economy is broadly similar to comparable countries.

F4.4

The services sector supplies over half the value of New Zealand's exports when both service inputs to goods exports and exports by the services sector are taken into account.

F4.5

Establishing a commercial presence in foreign markets via outward direct investment (ODI) is an important channel for firms to export services – particularly those that require co-location of the service provider and customer. New Zealand’s ODI as a proportion of GDP is low compared with most other OECD economies.

F4.6

Between-industry structural change over the past three decades had a small negative effect on New Zealand’s aggregate labour productivity growth. Within-industry labour productivity growth was much more significant. The effect of between-industry structural change on MFP growth has been negligible.

F4.7

A shift to services accounted for some of the negative between-industry effect on labour productivity growth, though shifts to wholesale trade and finance and insurance made positive contributions.

F4.8

The effect on labour productivity growth from employment shifting between industries, while small, was more negative in New Zealand than in other OECD countries between 1990 and 2005. This difference can partly be explained by strong growth in labour force participation and in the productivity of utility industries during the 1990s – both of which were desirable developments.

Chapter 5 – Competition in the services sector

Findings

F5.1

Services are generally less tradable over distance within New Zealand than are goods.

F5.2

The intensity of competition varies between industries within the services sector. But generally New Zealand’s service industries experience less intense competition than goods-producing industries and primary industries.

F5.3

When assessed at the whole-of-industry level, the service industries with relatively weak intensity of competition are:

- financial and insurance;
- rental, hiring and real estate;
- retail; and
- professional, scientific and technical.

F5.4

Foreign suppliers increase the intensity of competition in New Zealand service markets. Cross-border regulatory differences and screening requirements for foreign direct investment can discourage foreign service providers from establishing a local presence.

F5.5

New Zealand does not recognise some licences to practice held by foreign service providers even when those licences are based on equivalent or better standards than the corresponding New Zealand standards. Increased recognition of overseas qualifications would remove a barrier to competition.

Recommendations

R5.1

The Government should complete the implementation of the recommendations for reducing trans-Tasman barriers to trade in services made in the Commission's 2012 joint study with the Australian Productivity Commission, and build on them by reducing barriers to international trade in services with other countries.

R5.2

The Government should mandate the recognition of foreign licenses to practise when those licences are based on equivalent or better standards than the corresponding New Zealand standards.

Chapter 6 – Addressing search and switching costs

Findings

F6.1

Accurate and accessible comparison websites can help to reduce search costs and facilitate more competitive markets.

F6.2

Government initiatives to fund or develop comparison websites need to be appropriately resourced so that the information presented is accessible and accurate.

F6.3

Privately operated comparison websites tend to be less prevalent in New Zealand than in other countries. There are no apparent barriers to entry in this market, and new firms have entered in recent years. It is likely that the small scale of the New Zealand market makes it difficult for comparison websites to attract enough traffic to be commercially successful.

F6.4

Comparison websites can undermine consumer confidence if the sites fail to provide reliable information or are not transparent about the number of service providers they are comparing, how the sites receive revenue, how the sites rank providers and how the sites receive information.

F6.5

The existing provisions in the Fair Trading Act 1986 in conjunction with the regular monitoring activities of the Commerce Commission provide sufficient oversight of comparison websites. Currently there is no need for a government-sponsored accreditation system for comparison websites.

F6.6

Information disclosure requirements, in conjunction with accessible online presentation, can significantly improve the availability of information in complex service markets. Information disclosure regimes should be subject to a cost-benefit test as they can be costly.

F6.7

There is an absence of accessible comparative information about the services provided by third-tier lenders. Third-tier lenders will be required to disclose certain information if the Credit Contracts and Financial Services Law Reform Bill is passed. It would be beneficial if the information that the Bill mandates was compiled in a user-friendly online format. Several privately operated websites appear well equipped to do this.

F6.8

Phone number portability removed a significant barrier to switching and positively influenced competition in New Zealand telecommunications markets.

F6.9

Full bank account number portability is not available in any country. There is no case to introduce it in New Zealand at the present time as the cost would very likely exceed the benefits.

Recommendations

R6.1

Before the Government undertakes any initiative to reduce search and switching costs, it should establish that those costs do have adverse effects, and assess a range of intervention options using a thorough cost-benefit analysis.

R6.2

Unfair contract terms provisions introduced in the Fair Trading Amendment Act 2013 should be reviewed by the Ministry of Business, Innovation and Employment (MBIE) between two to four years after coming into effect. When this review is conducted MBIE should examine business-to-business contracting arrangements to establish whether there is any evidence of practices that are harmful to competition.

R6.3

To demonstrate the effectiveness of the existing bank switching process Payments NZ should collect and publish statistics that show the number of bank switches each year and how long the switching process takes.

R6.4

Government-funded studies examining competition in service markets should, to the extent possible, include business consumers as well as household consumers.

R6.5

The New Zealand Telecommunications Forum should investigate mechanisms to enable business and residential customers to switch internet service providers without losing access to emails. If a viable low-cost option exists it should be implemented.

R6.6

New Zealand officials should monitor international developments in bank switching and account number portability. If another country develops a workable approach, officials should closely examine its applicability for the New Zealand banking system.

R6.7

The Government should consider the competition benefits of a regime based on certification or registration rather than licensing when reviewing existing, or considering new, arrangements for the regulation of providers of professional services.

R6.8

When the Government decides that licensing is required to provide a minimum level of protection to all users of a professional service, the activity that requires licensing should be prescribed no more broadly than is required to achieve that protection. This could be achieved by confining the licensing requirement to prescribed areas of "restricted work".

R6.9

When the Government gives statutory recognition to professional bodies, it should be explicit in legislation about its expectations of those bodies, including their approach to competency standards (both entry and ongoing) and their approach to complaints resolution and reporting.

When the Government gives statutory recognition to professional bodies, it should require that the governing boards of professional bodies include members from outside the profession, and members knowledgeable about consumer perspectives. Also, the promotion of competition should be included in the statutory objectives of the professional body.

R6.10

The promotion of competition should be included in the statutory objectives of all professional bodies afforded statutory recognition.

Chapter 7 – Improving competition law

Findings

F7.1

The current law and jurisprudence under s 36 of the Commerce Act 1986 is not working well and risks causing losses of dynamic efficiency through failing to identify some cases where firms use their market power to restrict the ability of other firms to innovate and compete.

F7.2

It is important that the Commerce (Cartels and Other Matters) Amendment Bill is well understood by business. Industry associations may be able to help disseminate information about the Bill to their members, including information about the steps required to gain Commerce Commission clearance for collaborative arrangements.

F7.3

Competition authorities in many other countries use market studies. While they have common elements, practices vary significantly between jurisdictions.

F7.4

Several New Zealand agencies conduct research into competition in New Zealand markets, including the Commerce Commission, MBIE, the Productivity Commission and non-government consumer groups.

Recommendations

R7.1

The Government should review s 36 of the Commerce Act and its interpretation. The review should consider whether other approaches offer greater accuracy in identifying situations where firms have taken advantage of market power and damaged dynamic efficiency with consequent detriments to competition, innovation and/or productivity.

R7.2

The review of s 36 should take account of the review of competition policy in Australia, with a view to achieving a consistent approach that:

- furthers the goal of a single trans-Tasman economic market; yet
- still suits New Zealand's characteristics such as its small domestic market.

R7.3

The review of s 36 should include consideration of the merits of:

- a more flexible approach where courts do not rely on a single counterfactual test for an abuse of monopoly power;
- more of an "effects" approach to gauge whether conduct has harmed dynamic efficiency, and
- providing for an efficiency defence in cases where the conduct of a firm with substantial market power fails a primary test that it is harming competition.

R7.4

The Commerce (Cartels and Other Matters) Amendment Bill should be evaluated between two to four years after it comes into effect. The evaluation should consider impacts on the costs of doing business and undertaking innovation, and the extent to which the implications of the Bill are understood by a range of different types of business.

R7.5

The Commerce Commission should be able to undertake studies on competition in any specific market in the economy. To enable this, the Commerce Act should be amended to include a provision similar to s 9A (1) (b) of the Telecommunications Act 2001.

R7.6

The design of market studies should be based on existing practice under s 9A (1) (b) of the Telecommunications Act. The ability to make recommendations in market studies would be a useful additional feature, and this should be clarified in the Telecommunications Act and the Commerce Act.

Chapter 8 – ICT is revolutionising services

Findings

F8.1

ICT is transforming existing services and creating new ones. Its economic and social effects are comparable to those of previous general purpose technologies, such as steam and electricity, which transformed manufacturing and agriculture.

F8.2

Firms, industries and countries will be better off if they are flexible and adapt quickly – and at lower cost – to the opportunities that ICT creates and the devaluation of existing assets.

F8.3

Productivity growth from new ICT occurs largely through a process of “creative destruction” – the reallocation of resources towards successful existing firms and to new firms, and away from less successful existing firms. Reallocation is the single largest contributor to productivity growth. It operates across firms, industries and regions. Adjustment costs – the costs incurred in redeploying devalued assets – inhibit reallocation. Policies aimed at reducing adjustment costs can contribute to productivity growth.

F8.4

Extracting the highest possible returns from ICT requires complementary investments, including changes in business organisation. These complementary investments are typically more expensive than the direct cost of ICT.

F8.5

The economic characteristics of ICT include powerful economies of scale, non-rivalry and network effects. These economic characteristics underpin ICT’s strong current and potential future contributions to productivity, economic growth and wellbeing.

F8.6

Per-capita investment in ICT in New Zealand has historically been lower than that in most other comparable advanced countries.

F8.7

ICT is making a positive contribution to productivity in New Zealand. Its contribution is stronger in service industries.

F8.8

Countries face choices of policies and institutions that influence the way they respond to, and take advantage of, the ICT revolution. These choices are best made in a thoughtful and informed way, to avoid the risk of an uncoordinated set of policies and institutions, which work against each other and dissipate potential gains.

F8.9

The ICT revolution is creating continuous disruption. In a disruptive environment, rewards to flexibility exist at the individual, firm and national levels.

F8.10

In a disruptive environment, governments must strike a balance between providing stable regulatory settings and staying open to change brought about by emerging technologies.

F8.11

New Zealand and other countries will need to make major modifications to labour market institutions should the labour market changes from the ICT revolution prove to be as disruptive as many commentators are predicting.

Chapter 9 – ICT adoption by firms

Findings

F9.1

A firm's perceptions of risk, cost and returns affect its decisions about adopting ICT. Those perceptions are influenced by government policies, regulation and actions affecting infrastructure, taxes, subsidies and information dissemination.

F9.2

Firms in the services sector are more likely to have invested significantly in ICT during the past two years than those in either the goods-producing or primary industries.

F9.3

Firms in the services sector are investing in ICT to improve their services or support new activities. Reducing the cost of existing activities is the least common rationale for investing, according to survey responses.

F9.4

The factors that discourage New Zealand service firms from investing in ICT include the overall financial case and limited capital, and, of lesser importance, limited information, and limited access to skills.

F9.5

The vast majority of New Zealand service firms expect their ICT investment decisions to recover their costs. This suggests a conservative approach to decision making.

F9.6

Larger and established service firms face higher adjustment costs than start-ups in adopting ICT, partly because of the risk of incompatibility with or disruption to existing systems.

F9.7

It is less costly for multi-national enterprises, than for other firms, to pass tacit "in-house" information on new technology across borders. Multi-nationals may be an important route for technology diffusion into New Zealand.

F9.8

The roll-out of fibre-optic networks, and advances in mobile and copper-based fixed-line technology mean that domestic data-communications infrastructure is not constraining New Zealand businesses from adopting ICT.

F9.9

The Commission has found no evidence that international data connectivity is limiting the adoption of ICT by New Zealand firms.

F9.10

New Zealand firms are, on average, likely to delay adopting ICT compared to firms in larger developed economies, because of factors such as their relatively small domestic markets, distance to larger markets, smaller firm size and low labour costs.

F9.11

Restrictive employment protection legislation can make it hard for firms to adjust to new technology and thus reduces innovation. These effects are stronger in the more dynamic parts of the economy and in the services sector.

F9.12

Training and advice in effective management practices make a significant difference to firm performance. Effective people management practices, in particular, enable firms to make more productive use of ICT.

Recommendations

R9.1

The Ministry of Business, Innovation and Employment, when next reviewing the KiwiSaver Act 2006 or within three years, should consider options to make it easier for KiwiSaver providers to invest in private equity and venture capital.

R9.2

As a matter of promoting good policy advice, the Treasury, the State Services Commission and the Department of Prime Minister and Cabinet should ensure that the design of regulation that significantly affects the adoption of ICT by firms takes comprehensive account of costs and benefits.

R9.3

The Government Chief Information Officer and the Department of Internal Affairs should review and update guidelines for treatment of intellectual property rights (IP) in government ICT procurement contracts. The default position, in practice as well as in principle, should be that the supplier owns the new IP, with licenses being granted to the customer agency and all other state sector agencies. This would encourage lower prices and productive re-use of that IP by suppliers.

R9.4

The Treasury, the State Services Commission and the Department of Prime Minister and Cabinet, working together with the Government Chief Information Officer, should agree on and mandate a means to ensure that significant government ICT projects are evaluated and reviewed and the results disseminated both within government and more widely.

Chapter 10 – Supply and demand of IT skills

Findings

F10.1

Firms will likely respond to chronic information technology (IT) skills shortages by reducing technology investments.

F10.2

The demand for IT professionals globally has been rising for four decades. Given the falling cost of ICT and its increasing use, this pattern is likely to continue.

F10.3

The dotcom bust in 2000 saw a rapid fall globally in the number of students graduating with IT qualifications. In the United States, the United Kingdom and New Zealand the number fell by between a third and a half over a 5-year period, reflecting a loss of confidence in IT as a career. Enrolments in IT began to rise only after a lag of seven years, despite continuing rapid growth in IT jobs.

F10.4

Flows of IT professionals in and out of New Zealand are strong. New Zealand is highly reliant on immigration to fill IT professional vacancies – especially in some specialist areas. Migration flows cushion the impact of domestic supply fluctuations in the market for IT skills.

F10.5

New Zealand's immigration policies and practice present few barriers to professional ICT workers moving to New Zealand to take up relevant job offers. Once here, it is relatively easy for migrant professional workers to qualify for residence.

F10.6

New Zealand firms pay close to international wages for entry-level workers in some IT occupations. They pay much less than Australian firms in the upper ranges of remuneration, perhaps because the scope and responsibilities of these high-end jobs are greater in Australia. IT graduate earnings in New Zealand are high relative to graduates in most other fields of study.

F10.7

New Zealand firms, like firms in most other developed countries, report significant difficulty in recruiting IT professionals and managers. Some New Zealand firms are limiting their IT investments or sending work overseas because they cannot recruit enough skilled IT professionals in New Zealand.

F10.8

Larger ICT-using and ICT-producing firms use their resources to employ top IT graduates. These firms provide induction programmes that help graduates learn quickly about the business environment and proprietary systems. The firms also offer internships to IT students. This arrangement helps them identify the best talent.

F10.9

Small ICT-producing and ICT-using firms find it hard to recruit IT graduates who have the range of skills needed to operate successfully in their business environment. Such firms find it hard to collaborate with other similar firms and with tertiary education providers to help students gain a broader range of skills before graduation.

Recommendations

R10.1

The Government should seek to amend the Income Tax Act 2007 to increase the threshold from 92 to 183 days in any 12 month period under which income derived by a non-resident from performing personal or professional services within New Zealand is exempt from New Zealand tax liability.

R10.2

The Ministry of Education and the Tertiary Education Commission should continue to work with tertiary education providers to make information available on student employment outcomes by tertiary education provider, qualification and, where numbers are sufficient, by field of study. Once a robust information system is in place, the Ministry should regularly publish information on student outcomes by tertiary provider to help intending students with their choices.

R10.3

The Tertiary Education Commission and the Ministry of Business, Innovation and Employment should encourage tertiary education providers and IT industry and professional associations to promote one-year graduate diplomas in business studies for computer science graduates. This will better prepare IT graduates for work in firms whose business strategy is based on IT.

R10.4

The Tertiary Education Commission and the Ministry of Business, Innovation and Employment should work with industry associations, IT firms and education providers to develop initiatives that enable greater engagement and collaboration between education providers and ICT firms, especially small firms. This collaboration should aim to increase the supply of “work-ready” graduates.

Chapter 11 – Cloud computing

Findings

F11.1

One barrier to cloud computing is the psychological shift from physical control of data to control via contract. Overcoming this barrier typically involves designing contracts and institutions to minimise risk and to allocate it to those best able to bear it, and building trust in those contracts and institutions.

F11.2

Cloud computing infrastructure providers in the United States and Australia offer more options and significantly lower prices than equivalent New Zealand providers.

F11.3

Cloud computing improves the scalability of ICT products, allowing purchasers to buy the exact quantity and quality they prefer. This is particularly beneficial to firms that are small users of ICT, as they can serve their existing market at lower cost.

F11.4

Cloud computing can level the playing field for data-intensive New Zealand service firms competing in foreign markets. This “levelled playing field” will offer an overall cost advantage to New Zealand firms if other costs (such as labour) are lower than those of their competitors.

F11.5

Small firms in New Zealand appear to be slow adopters of cloud computing, despite its apparent benefits. Other factors, such as the costs of complementary investments or obtaining relevant knowledge, may be discouraging adoption.

F11.6

The process of “digital convergence”, where most content is digitised and the lines between different media are increasingly blurred, has made legislation specific to particular media types outdated.

F11.7

Free trade agreements are likely to have an increasing focus on “free trade in data”. Governments face a challenge of letting data flow freely across national borders without impeding the ability of each nation to enforce its laws.

F11.8

Restrictions on data flows will have a disproportionately negative effect on smaller countries such as New Zealand, as they lack the scale to support a wide range of sophisticated, home-grown, digital services.

Recommendations

R11.1

The Government Chief Information Officer and the Department of Internal Affairs should publicise their capacity and willingness to support government cloud computing and ICT-enabled business change for agencies. The ICT.govt.nz website should provide advice more balanced between benefits and risks, and share the lessons learned from previous and current cloud computing projects.

R11.2

The Government should address the data sovereignty, security and privacy risks associated with offshore cloud computing through international negotiations. Bilateral negotiations with Australia could be resolved quickly, so should be pursued as a first step. Resolving such issues will help New Zealand firms adopt cloud computing.

R11.3

The Government should give priority in international trade negotiations to internet issues.

R11.4

New Zealand should promote – and participate in – international forums with the aim of reducing the ability of multi-national firms providing digital services to shift their profits across national borders to avoid paying tax.

Appendix A Public consultation

Submissions, Issues Paper

INDIVIDUAL OR ORGANISATION	SUBMISSION NUMBER
Phil Hayward	1
Target Railway Progress	2
Sandra Goudie and others	3
New Zealand Home Health Association	4
Federated Farmers of New Zealand	5
New Zealand Manufacturers and Exporters Association	6
New Zealand Institute of Patent Attorneys Inc	7
Vodafone New Zealand Limited	8
BusinessNZ	9
Southern Cross Health Society	10
Insurance Council of New Zealand	11
New Zealand Council of Trade Unions, Te Kauae Kaimahi	12
Aviation Industry Association of NZ Inc	13
New Zealand Chambers of Commerce	14
Telecom New Zealand Limited	15
Alistair Sheat	16

Submissions, 1st Interim Report

INDIVIDUAL OR ORGANISATION	SUBMISSION NUMBER
Christchurch Airport	101
MYOB NZ Limited	102
DCW Management Ltd	103
Moneyworks NZ Limited	104
Sapere Research Group and Covec	105
Professor Stephen G MacDonell	106
Fisher Funds Management Limited	107
Donal Curtin, Economics New Zealand Limited	108
Alistair Sheat	109
Bank of New Zealand	110
Insurance Council of New Zealand	111
Private Asset Management Ltd	112
New Zealand Council of Trade Unions, Te Kauae Kaimahi	113
Porirua City Council	114
BusinessNZ	115
Hazards and Compass	116
Miles Hayward-Ryan	117
NZ Airports	118

Submissions, 2nd Interim Report

INDIVIDUAL OR ORGANISATION	SUBMISSION NUMBER
Donal Curtin, Economics New Zealand Limited	201
Insurance Council of New Zealand	202
BusinessNZ	203
IAG New Zealand Limited	204
New Zealand Council of Trade Unions, Te Kauae Kaimahi	205
Corporate Taxpayers Group	206
New Zealand Institute of Chartered Accountants	207
Russell McVeagh	208
NZRIse	209
Bell Gully	210
Veda	211
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2degrees Mobile Limited	217
Telecom	218
Westpac New Zealand Limited	219
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Professor Lewis Evans	222

Roundtables

INDUSTRY REPRESENTATIVES, 6 MAY 2013

Aviation Industry Association of New Zealand Inc
 Booksellers New Zealand
 Business Central
 BusinessNZ
 Hospitality New Zealand
 Insurance Council of New Zealand
 Motor Trade Association
 New Zealand Bankers Association
 New Zealand Institute of Chartered Accountants
 New Zealand Retailers Association
 New Zealand Shipping Federation
 Technology Association of New Zealand
 Tourism Industry Association New Zealand

GOVERNMENT AGENCIES, 10 MAY 2013

Land Information New Zealand
 Ministry of Business, Innovation and Employment
 Ministry of Foreign Affairs and Trade
 Ministry of Transport
 New Zealand Treasury
 Reserve Bank of New Zealand

COMPETITION LAW, 3 APRIL 2014

David Blacktop, Joel Bamford, Lilla Csorgo, Richard Sanders, Commerce Commission
 Edward Willis, Mark Toner, Webb Henderson
 Hamish Grant-Fargie, Karen Chant, Ministry of Business, Innovation and Employment
 James Every-Palmer, Barrister
 Professor Lew Evans, Victoria University
 Neil Anderson, Chapman Tripp
 Sarah Keene, Russell McVeagh
 Tony Dellow, Buddle Findlay

Engagement meetings**INDIVIDUAL OR ORGANISATION**

Adam Jaffe, Motu Economic and Public Policy Research
 Alcatel-Lucent
 Andrew Sharpe, Centre for the Study of Living Standards, Ottawa
 Association of Non-Governmental Organisations of Aotearoa (ANGOA)
 Betsy Masiello, Google
 Bronwyn Howell, NZ Institute for the Study of Competition and Regulation
 Commerce Commission
 Commission for Financial Literacy and Retirement Income
 Consumer NZ
 Council of the New Zealand Institute of Patent Attorneys Inc
 Dean Parham
 Department of Internal Affairs
 Diego Restuccia
 Digital Office
 Donal Curtin, Economics New Zealand
 Electricity Authority
 Financial Markets Authority
 Professor Frederick G Hilmer, University of New South Wales
 Fujitsu New Zealand
 Inland Revenue Department
 Institute of Environment Science and Research Limited
 Insurance Council of New Zealand
 Internet New Zealand
 Kiwibank
 Professor Lew Evans, Victoria University of Wellington
 Ministry of Business, Innovation and Employment
 Ministry of Education
 Professor Morris Altman, Victoria University of Wellington
 MYOB NZ Limited
 New Zealand Home Health Association

New Zealand Institute of Chartered Accountants
New Zealand Treasury
New Zealand Venture Investment Fund
New Zealand Bankers Association
New Zealand Law Society
New Zealand Retailers Association
New Zealand Telecommunications Forum
Professor Norman Gemmell, Victoria University of Wellington
NZRise
Payments NZ
Platform Trust
Progressive Enterprises
Reserve Bank of New Zealand
Richard Brett, Fieldpine
Richard Norman, Victoria University of Wellington
Rob Cameron, Cameron Partners
SilverStripe
Simon Walker, United Kingdom Institute of Directors
Statistics New Zealand
Professor Stephen G MacDonell, University of Otago
Summer of Tech 2013
Telecom New Zealand
Tertiary Education Commission
The University of Auckland
Tourism Industry Association New Zealand
Trade Me
Victoria Department of State Development, Business and Innovation
Victoria University, School of Engineering and Computer Science
Webb Henderson

ICT REFERENCE PANEL

The preparation of this report benefited from the input of an expert Reference Panel, drawn from leaders in New Zealand's ICT industry. The panel members were:

Brett Hodgson, BPMetrics
Natasha Crampton, Microsoft
Rohan MacMahon, Crown Fibre Holdings
Ross Young, Google

The reference panel were selected based on their individual knowledge and experience. They did not represent the views of their employers. The members of the reference panel donated their time and were not paid.

Disclosure: Murray Sherwin performs several other roles outside of the Commission, including with Statistics New Zealand, CERA and as Chair of the Innovation Partnership. The Partnership engages a number of organisations and individuals with an interest in smart use of internet technology. The membership of the Partnership, and other background, is available at www.geton.net.nz/about/. The Partnership was an initiative of Google NZ, who continue to support its operation.

Appendix B OECD industry abbreviations

This appendix is a reference for the abbreviations used in this report for the OECD industry classifications. Please refer to Appendix D for ANZSIC industry classifications and abbreviations.

Table B.1 OECD industry abbreviations

Abbreviation	ISIC Rev.3 2008 Industry name	Shortened version
Agri	C01t05 Agriculture, hunting, forestry and fishing	Agriculture, forestry and fishing
Mining	C10t14 Mining and quarrying	Mining
Manufac	C15t37 Manufacturing	Manufacturing
Electric	C40t41 Electricity gas and water supply	Electricity, gas and water supply
Construc	C45 Construction	Construction
Trade	C50t52 Wholesale and retail trade; repairs	Wholesale and retail trade
Transport	C60t63 Transport and storage	Transport and storage
Telecomms	C64 Post and telecommunications	Post and telecommunications
Finance	C65t67 Finance and insurance	Finance and insurance
Computers	C72 Computer and related activities	Computer services
Business	C74 Other business activities	Other business services
Hotels	C55 Hotels and restaurants	Hotels and restaurants
Real est.	C70 Real estate activities	Real estate
Rentals	C71 Renting of machinery and equipment	Renting of machinery
Personal	C90t93 Other community, social and personal services	Community and personal services
Households	C95 Private households with employed persons	Households with employed persons
Finance & business	C65t74 Finance, insurance, real estate and business services	Finance and business
Business sector	C50t74x Business sector services excluding real estate	Business sector services

Source: Productivity Commission; OECD structural analysis statistics tables.

Appendices C-I Additional material on the Commission's website

Appendices C to I are available from the Commission's website www.productivity.govt.nz.

Appendix	Title	Contents
C	Measuring the output of service industries	A summary of the standard methods that Statistics New Zealand uses to measure the output (value-added) of service industries. It describes the challenges and complexities of these measurements.
D	Industry classifications and abbreviations	A reference for the industry classifications and abbreviations used in this report. It also shows the broad correspondence between the ANZSIC06 industry classification and the other industry classifications used in this report.
E	Influences on productivity	A summary of the main influences on firm and industry productivity, which ultimately impact economy-wide productivity.
F	Understanding New Zealand's service industries	An examination of some distinctive features of the industries that make up the services sector.
G	Productivity performance – additional material	Data and analysis to supplement the discussion of the productivity performance of New Zealand's services sector in Chapter 3.
H	Input-output accounting for the New Zealand economy	Summary table and methodology for the input-output accounting for the New Zealand economy used in Chapter 4.
I	Application of ICT in retail and wholesale	An examination of New Zealand's retail and wholesale industries to illustrate the opportunities and barriers that affect adopting ICT.

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