MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
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Monopsony in the NZ labour market

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Productivity Commission Sausage Roll Seminar

21 March 2023

New Zealand Government

Background and motivation

Growing interest in the role of firms in the labour market, particularly their ability to set wages (monopsony power)

- E.g. Card et al. (2018), Card (2022), Manning (2021), Ashenfelter et al. (2021), Sokolova and Sorensen (2021)

New Zealand is a small country with a geographically dispersed population

- Outside employment options may be limited for some workers
- Labour market excluded from Commerce Act
- Relatively large gross labour market flows, high participation and employment

Relevant for thinking about a range of current labour market policy issues (e.g. minimum wage, collective bargaining, restraint of trade clauses)

Implications for wage inequality, income inequality, labour market dynamics, resource reallocation

Key research questions

Main question: what degree of wage setting power do firms in NZ possess?

Where in the labour market do firms have greater wage setting power?

What are the wider implications of any monopsony power?

This paper

What degree of wage setting power do firms in NZ possess?

- Estimate this using a range of approaches
  - Dynamic monopsony (separation elasticity, Manning 2003)
  - Estimate wedge between marginal product and wage (Yeh et al 2022; De Loecker and Warzynski 2012)
  - Directly estimate labour supply elasticity

- Compare estimates from different approaches
  - Both overall and by industry
  - What are possible explanations for why any differences may occur?

Labour market monopsony

In perfectly competitive labour markets, firms face horizontal labour supply curves

- Elasticity of (firm) labour supply with respect to the wage = ∞ (or very large)
- If firms cut wages by even 1c, all workers leave, can't hire any workers
- If firms raise wages by even 1c, inundated with applications (and will make lower profits)
- Means firms pay the *market wage*

Monopsonistic labour markets – firms face *upward* sloping labour supply curves

- Not perfectly elastic labour supply
- Firms have (some) wage setting power

Monopsony – static textbook model

Consider a profit-maximising firm that faces an *upward* sloping LS curve:

$$\Pi = \max(f(L) - w(L)L)$$

Profit-maximising wage is then:

$$w = MRP_L \frac{\eta}{1+\eta}$$

Where $0 < \eta < \infty$ is the elasticity of the labour supply curve

Wage is a mark-down on MRP_L and size of mark-down depends on LS elasticity η

More general models of static monopsony – jobs are imperfect substitutes

Dynamic monopsony

Dynamic labour supply:

$$L_t = \big(1 - s(w)\big)L_{t-1} + R(w)_t$$

s is separation rate, R is flow of new recruits

Monopsony power from search frictions

In steady state:

$$L = \frac{R(w)}{s(w)} \Rightarrow \eta = \eta^R - \eta^s$$

Manning (2003) shows, if the probability of a worker moving firms depends only on relative wages, a (weighted) average of the separation elasticity equals a (weighted) average of recruitment elasticity, so can focus on separations

- rule of thumb: $\eta = -2 * \eta^s$

Previous estimates of LS elasticities

Meta-analysis by Sokolova and Sorensen (2021)

- Range of (mean) estimates -3 and 30 (median estimates between 0.4 and 4.5)
  - Mean estimate 7, median 1.7
  - Large differences between direct (L on w) and indirect (w on L) – indirect estimates tend to be larger
  - ‘Best practice’ estimates around 6-7

Card (2022) overview

- More recent estimates in the range of 4-6

Data – wages and job movements

IDI/LBD

- Fabling and Maré (2015a) labour tables
  - Monthly job-level information on employment and earnings, whole economy
  - Derive information on job ends, job-to-job transitions
- Fabling and Maré (2015b; 2019) productivity tables
  - Annual firm-level financial information, including estimated MFP, private-for-profit measured sector
- Firm-year dataset with information on avg. monthly separation rate, job-to-job rate, wages, gross output, intermediates, capital. Restricted to firms with L>5 and an MFP estimate
- 39,114 firms over the period 2002-2019 (257,445 total obs)

Data – separations and job-to-job transitions

Job separations

- sum the number of spell ends within a month for each firm
- Create an RME-type annual measure (sum(spell ends)/12)
- Separation rate is then separation_rme/RME
- Proxy for the probability a worker leaves the firm

Job-to-job transitions:

- For each spell end, do we see the worker at another firm within the next two months? If so, we call this a job-to-job separation
- Calculation then proceeds as above

Data - wages

Use two measures of the wage

Avg. firm wage

- Avg. annual earnings for job-months that are FTE=1

Firm wage premium

- 2-way fixed effect model (Abowd et al. 1999)
- Take the estimated firm fixed effect and residual
- Proxy for the part of the wage more under control of the firm

Descriptive evidence – share of new hires from previous employment

Time series indicator suggested by Manning (2003), based on Burdett and Mortensen (1998).

Basic idea – in a more competitive labour market you will have more hires from employment as firms compete for workers

In the model, this is a higher job-offer arrival rate (hires from employment) relative to the job destruction rate

In periods of high unemployment, easier to expand employment by hiring unemployed workers – less competition for incumbent workers

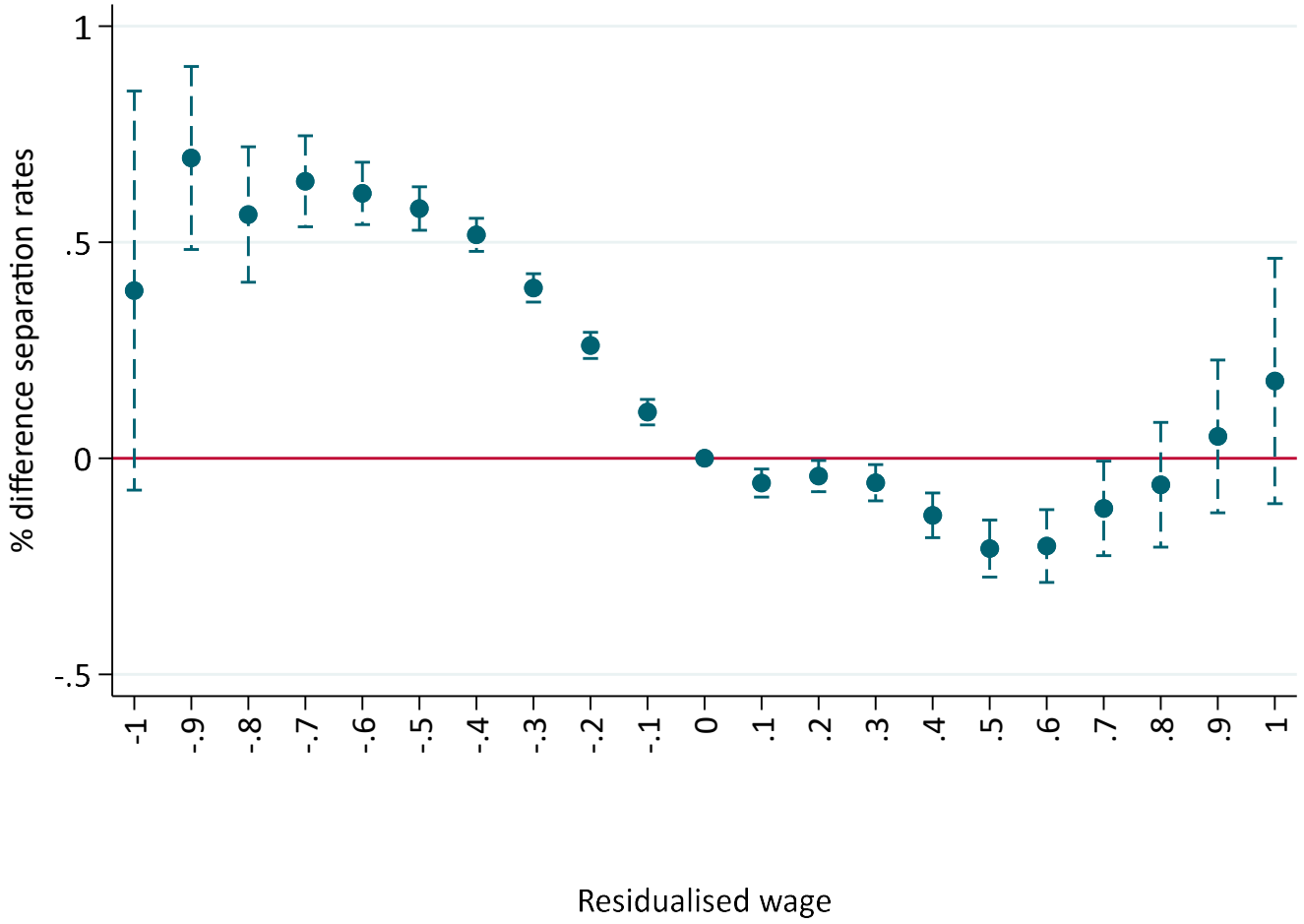
Descriptive evidence – how separation rates vary with the wage – admin data

Replicating analysis from Langella and Manning (2021) using **tax data**

'Residualised wage' – log earnings less individual-specific components of a 2-way fixed effect model

Slope of the relationship interpreted as separation elasticity

Relatively flat at the tails, steeper slope in the middle of the distribution. Similar to Langella-Manning



Empirical approach – separation elasticity

How sensitive are worker movements to the wage?

$$\ln s_{jt} = \alpha_j + \eta^s \ln w_{jt} + X_{jt}^s \beta^s + \lambda_t + \varepsilon_{jt}$$

α_j is a firm fixed effect, λ_t are year dummies, X contains workforce demographics (% workforce by gender, ethnicity, age, urban vs. rural)

Need an instrument for $\ln w$ - we use lags of estimated MFP from the productivity tables

- Component of MRP_L, demand shifter
- Doesn't obviously affect LS curve

Empirical approach – LS elasticity

Direct estimate of LS elasticity:

$$\ln L_{jt} = \phi_j + \eta \ln w_{jt} + \tau_t + \omega_{jt}$$

Again we use estimated MFP as an instrument for the wage

- Component of MRP_L, demand shifter
- Doesn't obviously affect LS curve
- May be an issue given how MFP is calculated (output – f(inputs))

Empirical approach – estimating MRPL-wage wedge

Approach implemented by Yeh et al. (2022) that uses the production approach to estimating price markups (De Loecker and Warzynski 2012)

Markup (price wedge?) can be calculated as:

$$\mu_h = \theta_h * \left(\frac{c_h}{R}\right)^{-1}$$

Where θ_h is the output elasticity of input h, c_h is total cost of h, and R is revenue. Ratio should be >1

Empirical approach – estimating MRPL-wage wedge

Yeh et al (2022) 'double-ratio' estimate of MRPL-wage wedge (monopsony power):

$$\mu_L = \theta_L * \left(\frac{wL}{R}\right)^{-1} * \mu_M^{-1}$$

μ_M is the markup on materials (product price markup). Used to control for the presence of product market power as well (monopoly power). Values >1 indicate monopsony power

Key assumption – materials (or some other flexible input) is free from monopsony forces.

Empirical approach – estimating MRPL-wage wedge

Have data on costs and revenues, tricky part is getting a good estimate of output elasticities from production function

We follow Yeh et al. and estimate industry-specific gross-output translog production functions

- Use estimator of Ackerberg et al (2006)
- Also a simple IV approach using lags as instruments
- Translog function means we can get firm-specific estimates of the output elasticities
- Firm-specific wedge estimates, averaged across firms

Empirical approach – estimating MRPL-wage wedge

Criticisms of production-based approach to measuring market power, particularly when (deflated) revenue data is used (Bond et al. 2021)

- Markups are not identified when using revenue data

Hashemi et al (2022) shows that *input* price distortions can be identified from revenue data

We produce the “double ratio” estimate of Yeh et al and also the single-ratio estimate suggested by Hashemi et al

Comparing estimates

We convert all our estimates into a single metric for comparison purposes, that we call the wage markdown

$$Markdown = 1 - \frac{w}{MRPL} = \frac{1}{1+\eta}$$

Should be in the range of 0 to 1, with higher values indicating greater monopsony power

Measures the % of MRPL that is not paid in wages

Results - separation elasticity estimates

	(1) All separations avg. wage	(2) All separations firm premium	(3) J2J separations avg. wage	(4) J2J separations firm premium
	Unweighted			
η^s	-1.590***	-2.180***	-1.907***	-2.618***
	[0.132]	[0.185]	[0.161]	[0.222]
Implied η	3.18	4.36	3.81	5.33
Implied markdown	23.9%	18.7%	20.8%	15.8%
	Employment weighted			
η^s	-1.529***	-2.154***	-2.482***	-3.499***
	[0.487]	[0.775]	[0.563]	[0.896]
Implied η	3.06	4.31	4.86	7.00
Implied markdown	24.6%	18.8%	17.1%	12.5%

Results – production approach

	(6) IV FE, single ratio	(7) ACF, single ratio	(9) IV FE, double ratio	(10) ACF, double ratio
	Unweighted			
Estimated $\frac{MPL}{w}$	1.13	1.16	0.89	0.905
Implied η	7.69	6.17	-9.09	-10.52
Implied markdown	14.5%	13.9%	-12.3%	-10.5%
	Employment weighted			
Estimated $\frac{MPL}{w}$	1.067	1.180	0.857	0.814
Implied η	14.92	5.56	-6.99	-5.57
Implied markdown	6.3%	15.2%	-16.7%	-21.9%

Results – direct estimation

	OLS – wage	OLS – premium	IV – wage	IV – premium
	Unweighted			
Estimated η	0.0298	0.489***	0.0688	1.585***
	[0.0211]	[0.0156]	[0.162]	[0.207]
Implied markdown	97%	67%	93%	38.7%
	Employment weighted			
Estimated η	-0.388***	0.316***	-2.484***	-1.364
	[0.112]	[0.0816]	[0.713]	[1.025]
Implied markdown	-163%	76%	-67%	-274%

Results – across industries

Industry-level estimates frequently imprecise and poorly identified, particularly using the production approach

Correlation between separation-based and production-based estimates of wage markdowns generally low

Subset of industries that have reasonably consistent results across approaches

Imprecision makes it hard to draw strong conclusions here

Summary and next steps

Monopsony power seems to be a pervasive feature of NZ labour market

- Wage markdown of up to 25%

Some consistency in estimates based on separation elasticity and production approach

- Production approach estimates at the lower end of range based on separation elasticity
- How much power firms have vs. how much they can exercise? (e.g. minimum wage?)

Our estimates broadly consistent with international estimates

- As surveyed by Card (2022) and Sokolova and Sorenson (2021)

While some features of NZ's labour market (e.g. geographic dispersion) suggest greater potential for monopsony power than in other countries, other features (e.g. highly dynamic) appear to be acting as a counterweight

Summary and next steps

Our estimates represent for the average worker/firm and exclude large sectors of the workforce

- Particularly health and education

May be pockets of the labour market where monopsony power is greater

- Of particular concern at low-end of labour market
- Descriptive evidence suggests more monopsony power here

Future research will look to use factors such as changes to minimum wages to better understand monopsony power at lower end of labour market

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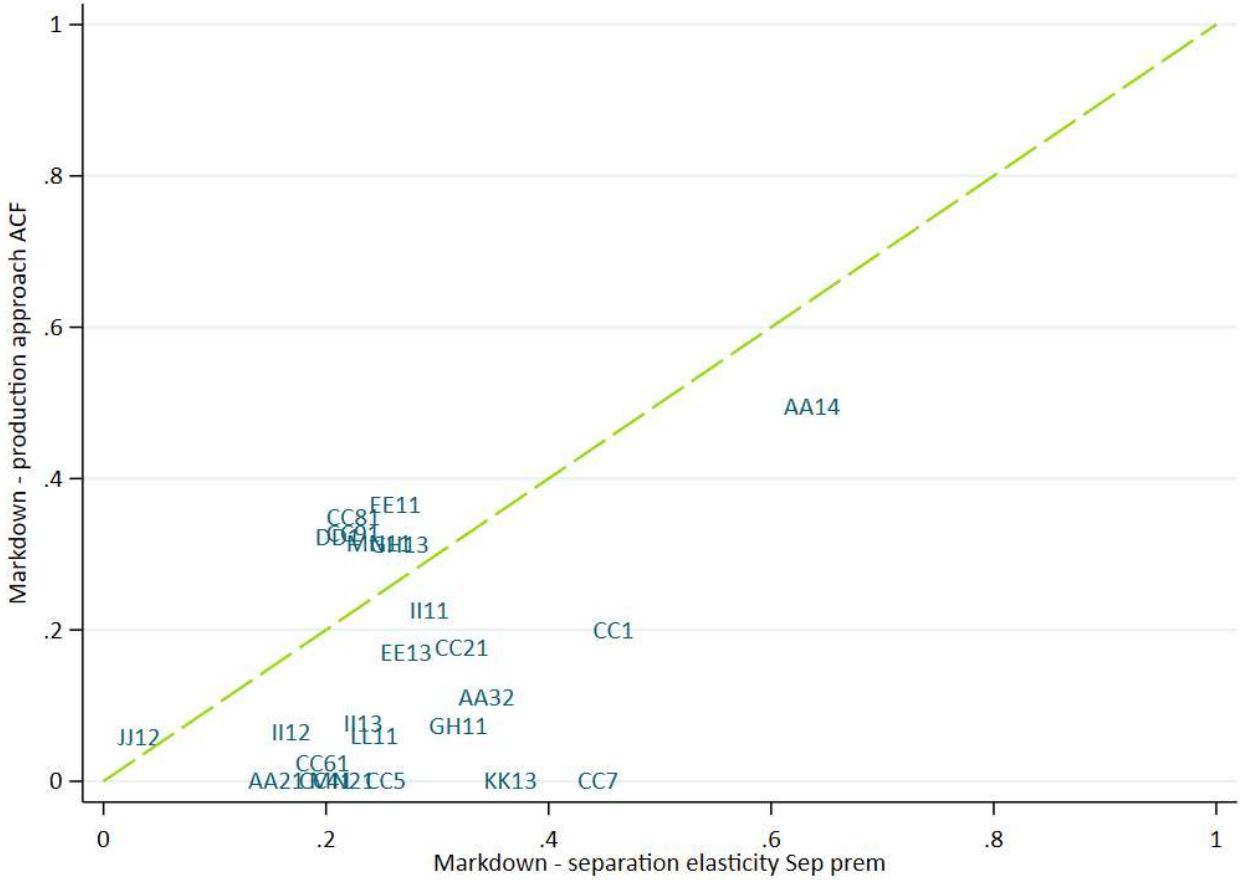
Disclaimer

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) and Longitudinal Business Database (LBD) which are carefully managed by Stats NZ. For more information about the IDI and LBD please visit https://www.stats.govt.nz/integrated-data/.

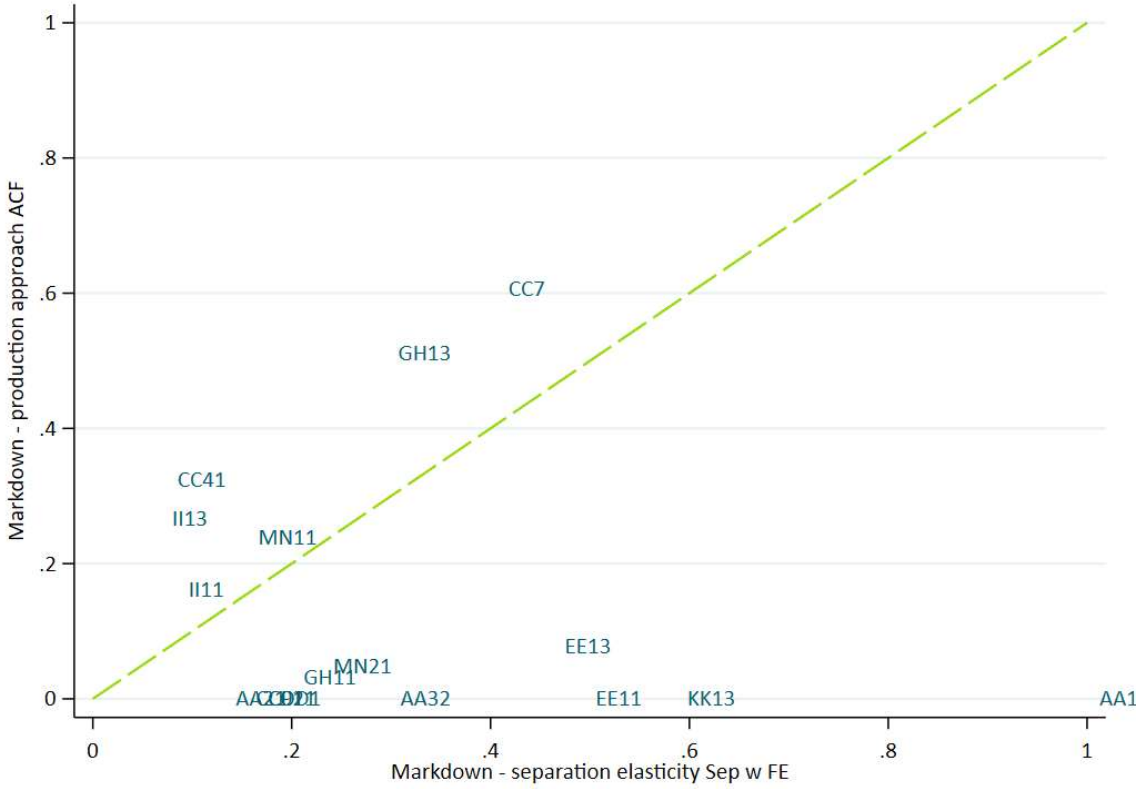
The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.

Supplementary slides

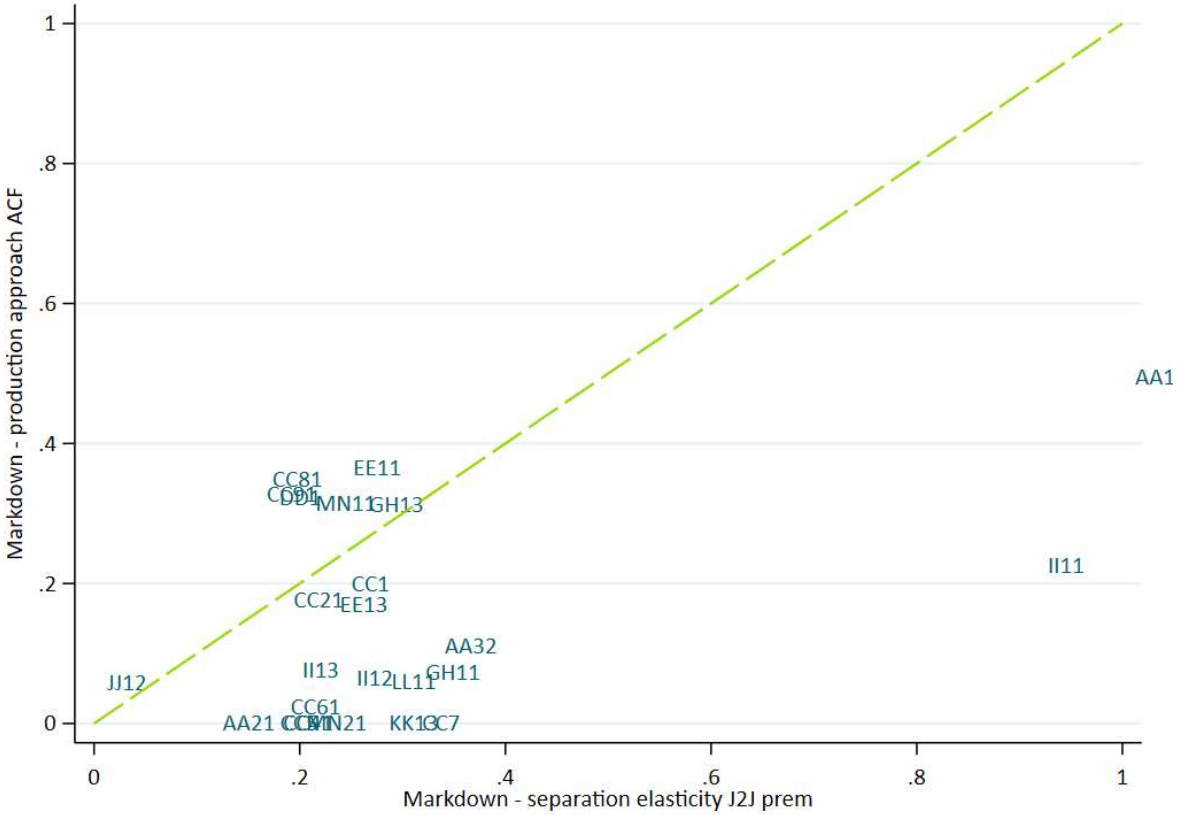
Results by industry – ACF and all separations-wage premium (unweighted)



Results by industry – ACF and all separations-wage premium (weighted)



Results by industry – ACF and J2J separations-wage premium (unweighted)



Results by industry – ACF and J2J separations-wage premium (weighted)