Rent Sharing and Inclusive Growth

Brian Bell
King's Business School and Centre for Economic Performance, LSE

Paweł Bukowski
Centre for Economic Performance, LSE

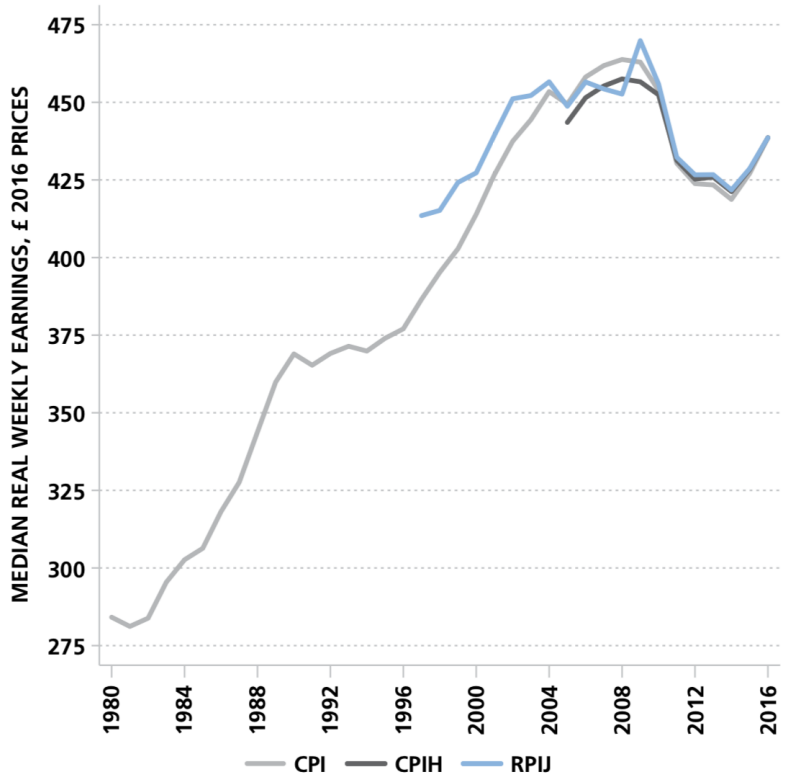
Stephen Machin
Department of Economics and Centre for Economic Performance, LSE

02.12.2019, ECB/CEPR Labour Market Workshop

CENTRE *for* ECONOMIC PERFORMANCE

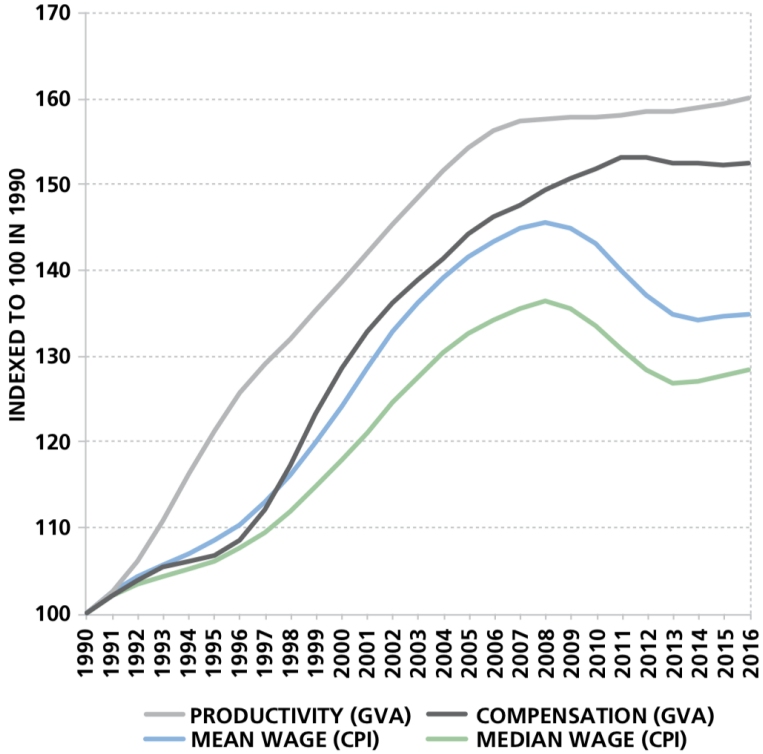
Motivation

FIGURE 2.3: ANNUAL MEDIAN REAL WEEKLY EARNINGS



Notes: Weekly earnings deflated by CPI, CPIH and RPIJ. Source: Annual Survey of Hours and Earnings (ASHE).

FIGURE 2.2: PRODUCTIVITY, WAGES, AND COMPENSATION



Notes: Growth rates of real productivity, real compensation (deflated by the GVA deflator), real average and median wages per hour (deflated by the CPI). Source: OECD National Accounts, ONS.

LSE Growth Commission (2017)

Motivation

Harold Meyerson, American Prospect (2014)

for the vast majority of American workers, the link between their productivity and their compensation no longer exists

The Economist (2013)

unless you are rich, [gross domestic product] growth isn't doing much to raise your income anymore

Anna Stansbury and Lawrence Summers, FT (2017)

productivity growth is doing much more to raise typical pay than an initial look at the productivity-pay divergence [suggests]

- Is it about productivity of median workers or rather their bargaining power?
- The role of firm's wage setting process has been overlooked.

This Paper

- The long-run evolution of rent sharing among UK-domiciled companies.
  - We construct a comprehensive and consistent panel of firms since 1983, spanning the entire economy.
  - Complemented with the analysis of the UK manufacturing firms, and the EU and US industries.
  - Investigating the role of market power (superstar firms).

Results

- We show that UK-domiciled companies share their profits (elasticity .012).
- Decline in rent sharing, the elasticity after 2000 is four-time smaller than before.
- Similar findings for other datasets and countries.
- A positive association between market power and rent sharing, but weaker after 2000.

Contributions

- One of the first comprehensive studies to estimate the long-run evolution of rent sharing.
  - Bell and Van Reenen (2011) document falling rent sharing for the US manufacturing industries.
  - Benmelech, Bergman and Kim (2018) present similar findings for the US manufacturing companies.
  - Our study covers the entire economy and looks at global and domestic operations.
- A decline in rent sharing:
  - $\rightarrow$ growing capital share.
  - $\rightarrow$ falling firm-wage premia.
- The role of market power. Competition policies should also be analysed from the labour market perspective.

Relationship Between Wages and Rents

- A correlation between wages and economic rents is not a feature of a standard perfect competition model.
- A monopsonistic model with upward sloping labour supply curve.
  - Positive demand shock $\rightarrow$ wages must rise in order to increase employment.
  - Short-run relationship.
- An incentive pay model with risk-averse workers and firms.
  - Sharing of good and bad times.
  - Long-run relationship.
- A bargaining model with rent sharing. model
  - Workers and firms bargain over wages. Workers appropriate a portion of rents.
  - The correlation captures workers' bargaining power.
  - Long-run relationship.

A Bargaining Model with Rent-Sharing

- A company divides its economic rents between the owner (profits) and workers (wages above the market level).
- Workers and firms engage in a Nash bargain, with standard maximization problem

$$max[\theta \ln[(u(w) - u(\overline{w}))n] + (1 - \theta) \ln(\pi)]$$

- FOC implies:

$$w \cong \overline{w} + (\frac{\theta}{1 - \theta})\frac{\pi}{n}$$

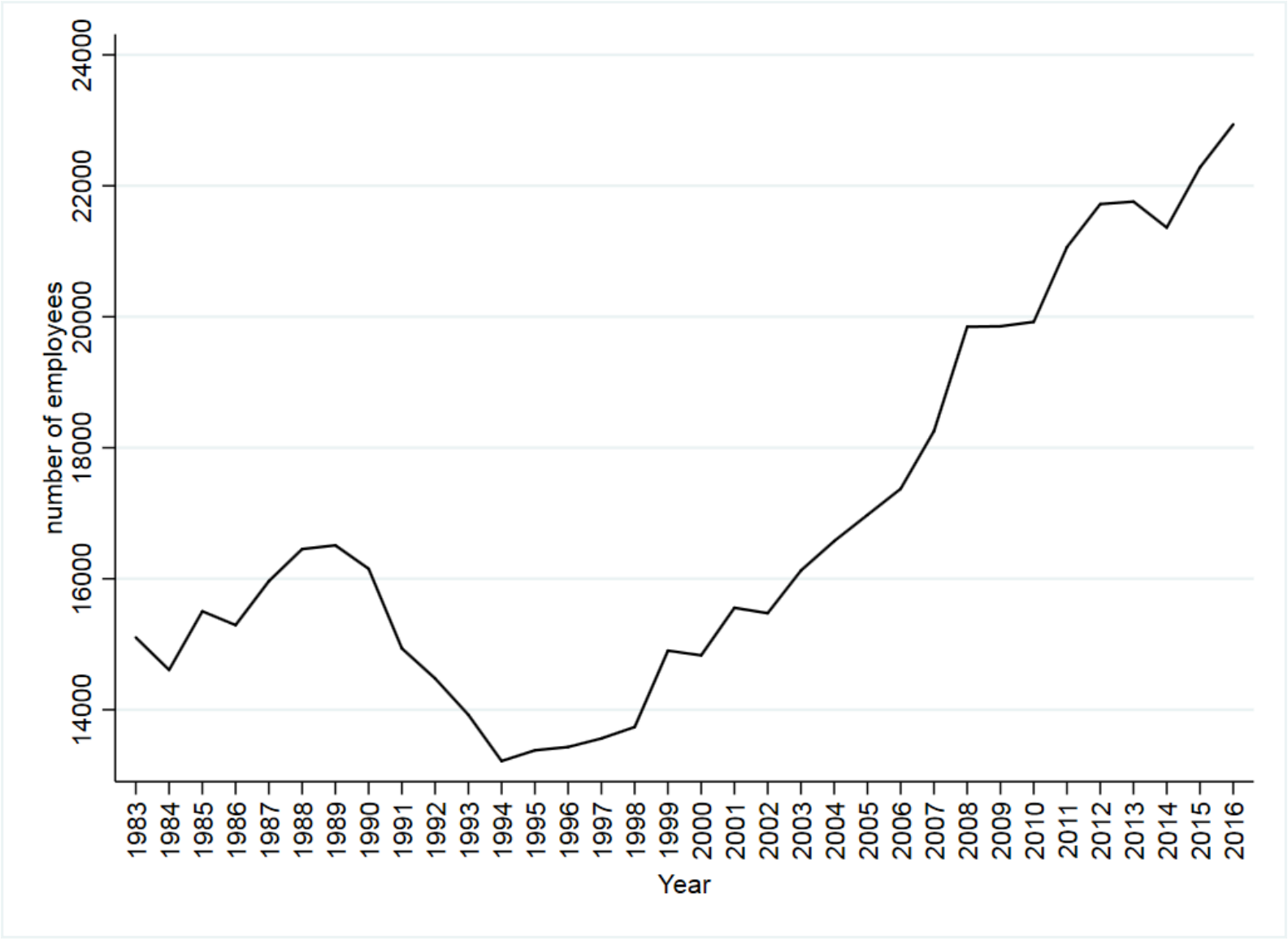
Existing Empirical Evidence

- Studies have found elasticity within the range of .01-.11. more
- The validity of instrumental variables estimates in this literature remains a contentious issue.
  - Most studies tend to instrument firm-level rents with industry-level rents or shocks (e.g. Card et al., 2014; Estavao and Tevlin, 2003), but the exclusion restriction is not likely to be satisfied (Manning, 2011).
  - Some studies use patents (Van Reenen, 1996; Kline et al., 2017), but the first stage is weak.
  - In general, instrumenting profits increases the estimated elasticity.
- We use GMM and two-period (and before) lags as instruments (Arellano and Bond, 1991). Also report estimates using a leave-out industry measure.

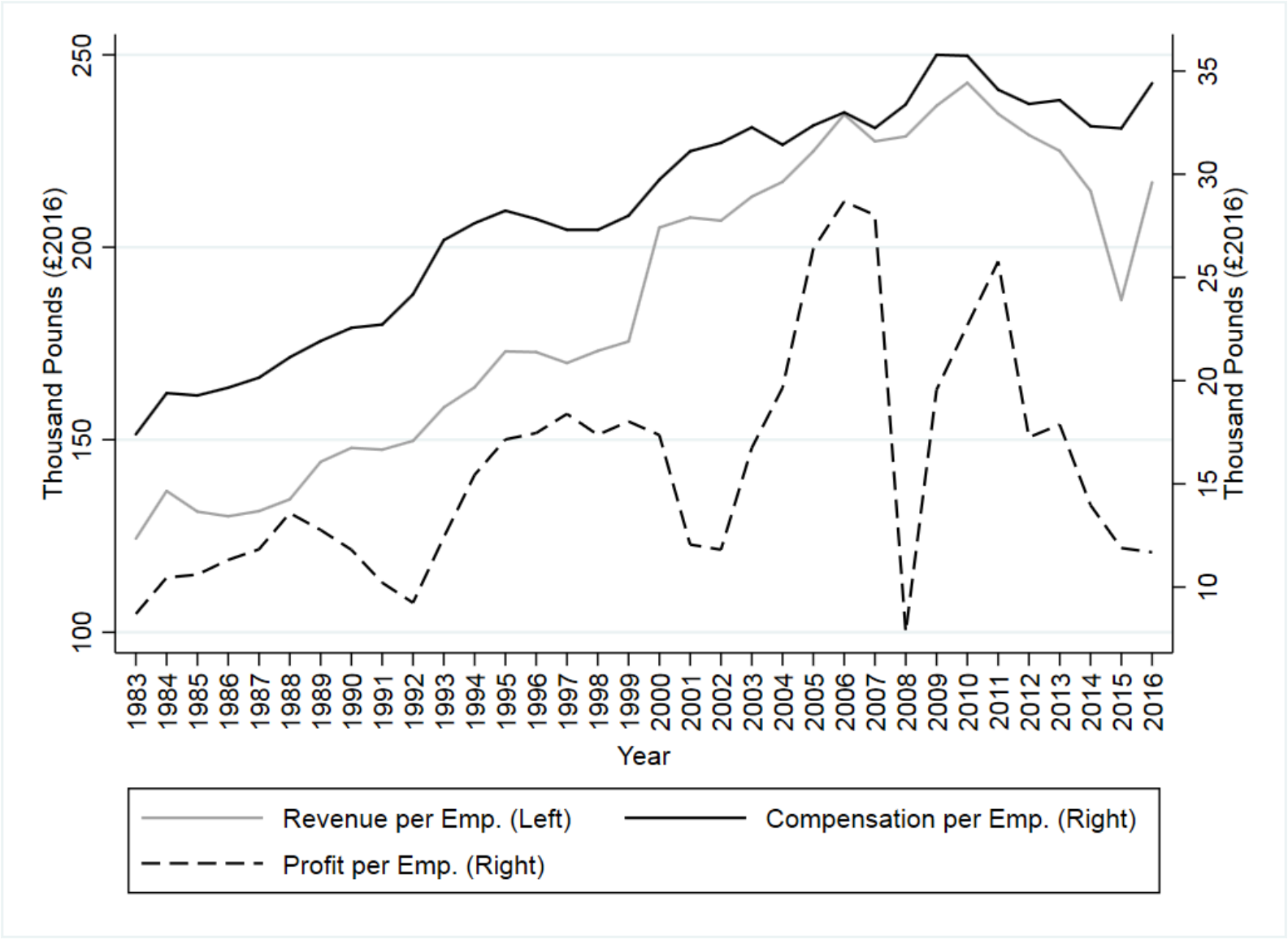
Data

- Our universe are the largest 300 (by market cap) firms on the London Stock Exchange between **1983-2016**, domiciled and registered in the UK.
  - Except investment, unit and real estate trusts.
  - Except firms, which were in the top 300 for <=2 years.
  - Consider all available years, even when outside the top 300.
- 832 companies, 11478 observations. 95% of the market cap, >7mln employees.
- Data: more
  - Manually collected from annual reports (Mergent Archives, Company House).
  - Worldscope, Compustat, Orbis, Fame, Cambridge DTI, Exstat.
- We capture *global* operation.

Mean Employment



Real Revenue, Compensation and Profit per Employee



The Rankings of Companies

	1983		2000		2016	
	Market Cap (in mln)		Market Cap (in mln)		Market Cap (in mln)	
1	British Petroleum	7421	Vodafone Group	158124	HSBC Holdings	130498
2	General Electric Company	4888	British Petroleum	121844	British Petroleum	99236
3	Imperial Chemical Industries	3880	GlaxoSmithKline	118910	British American Tobacco	86162
4	Marks & Spencer Group	2830	HSBC Holdings	91284	GlaxoSmithKline	76695
5	British American Tobacco	2631	AstraZeneca	59619	AstraZeneca	56137
	Employment		Employment		Employment	
1	British American Tobacco	187173	Unilever	295000	G4S	592897
2	General Electric Company	170865	Anglo American	249000	Compass Group	527180
3	Grand Metropolitan	136297	Sainsbury	185200	Tesco	464520
4	British Petroleum	131600	HSBC Holdings	161624	HSBC Holdings	235175
5	Unilever	127000	Tesco	152210	Sainsbury	181900
	Revenue (in mln)		Revenue (in mln)		Revenue (in mln)	
1	British Petroleum	32381	British Petroleum	97900	British Petroleum	136100
2	Imperial Chemical Industries	8256	Aviva	40244	Legal & General Group	77969
3	British American Tobacco	7904	HSBC Holdings	33182	Prudential	71842
4	Barclays	7888	Unilever	28977	HSBC Holdings	60495
5	Natnl Westminster Bank	6605	Prudential	28078	Tesco	55917

The UK-domiciled Companies - Empirical Specification

$$w_{ijt} = \alpha w_{ij-1} + \sum_{l=0}^{L} \beta_l \pi_{ijt-l} + \sum_{l=0}^{L} \gamma_l U_{t-l} + \sum_{l=0}^{L} \delta_l \overline{w}_{jt-l} + \\ + \mu_i + f(time) + \epsilon_{ijt}$$

- w_{ijt} - log of compensation per employee for company i, industry j at time t.
- π_{ijt} - profit before tax per employee.
- U_t - log of nationwide unemployment (ONS).
- $\overline{w}_{jt}$ - log of industry average wages (KLEMS).
- Endogeneity - we take first Δ and use lagged levels as instruments (Arellano-Bond).
- We trim the 1/99th percentiles of profits per employee (Card et al. 2014).

The UK-domiciled Companies, 1983-2016

	Dependent Variable: Log w_{ijt}							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log w_{ijt-1}	0.477***	0.488***	0.43***	-0.177***	0.478***	0.494***	0.445***	-0.187***
	(0.034)	(0.034)	(0.052)	(0.028)	(0.035)	(0.036)	(0.054)	(0.028)
π/n_{ijt}	0.006***	0.008***	0.01***	0.008***	0.006***	0.008***	0.009***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
π/n_{ijt-1}	-	-0.002**	-0.003	0	-	-0.002*	-0.003	0.001
		(0.001)	(0.002)	(0.003)		(0.001)	(0.002)	(0.003)
π/n_{ijt-2}	-	-	0.002	0	-	-	0.002	0.001
			(0.002)	(0.001)			(0.002)	(0.001)
π/n_{ijt-3}	-	-	-0.001	-0.002**	-	-	-0.001	-0.002**
			(0.001)	(0.001)			(0.001)	(0.001)
LR Coefficient	**0.011**	**0.010**	**0.013**	**0.006**	**0.011**	**0.011**	**0.013**	**0.007**
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Lester Range	**0.158**	**0.144**	**0.183**	**0.093**	**0.160**	**0.155**	**0.182**	**0.108**
Firm-Years	11478	11380	9751	9751	11478	11380	9751	9751
Firms	832	829	731	731	832	829	731	731
Time	Quad	Quad	Quad	Quad	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	No	Lag(2/.)	Lag(2/.)	Lag(2/.)	No

*Standard errors (in parentheses) clustered at firm level. *** p<0.001, ** p<001, * p<0.05*

The UK-domiciled Companies, Sub-Periods

	Dependent Variable: Log w_{ijt}									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1983-2000	2001-2016	1983-1991	1991-2000	2000-2009	2009-2016	1983-1991	1991-2000	2000-2009	2009-2016
Log w_{ijt-1}	0.376***	0.428***	0.620***	0.438***	0.512***	0.253***	0.351*	0.359***	0.597***	0.265***
	(0.086)	(0.062)	(0.161)	(0.077)	(0.057)	(0.083)	(0.183)	(0.129)	(0.085)	(0.098)
π/n_{ijt}	0.017***	0.01***	0.002	0.017***	0.010***	0.004	0.013	0.033***	0.008*	0.005
	(0.004)	(0.003)	(0.006)	(0.003)	(0.003)	(0.003)	(0.021)	(0.009)	(0.005)	(0.006)
π/n_{ijt-1}	0	-0.003	0.014	-0.003	-0.005	0.002	0.014	0.006	-0.006	0.007**
	(0.004)	(0.003)	(0.010)	(0.003)	(0.004)	(0.002)	(0.025)	(0.011)	(0.008)	(0.003)
π/n_{ijt-2}	0.004	0.002	0.003	0.006*	0.002	-0.001	0.014	-0.001	-0.003	-0.008*
	(0.003)	(0.002)	(0.008)	(0.003)	(0.002)	(0.001)	(0.025)	(0.009)	(0.005)	(0.005)
π/n_{ijt-3}	0.006*	-0.002*	-	-	-	-	-	-	-	-
	(0.003)	(0.001)								
LR Coefficient	**0.043**	**0.012**	**0.050**	**0.035**	**0.016**	**0.007**	**0.065**	**0.060**	**-0.003**	**0.006**
	(0.013)	(0.004)	(0.042)	(0.009)	(0.007)	(0.004)	(0.053)	(0.021)	(0.028)	(0.012)
Lester Range	**0.445**	**0.200**	**0.486**	**0.373**	**0.277**	**0.104**	**0.627**	**0.642**	**-0.056**	**0.095**
Firm-Years	4719	5032	1,901	3,748	3,437	2,474	1,897	3,748	3,437	2,474
Firms	547	503	404	539	494	379	404	539	494	379
Time	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Ind. Profits	Ind. Profits	Ind. Profits	Ind. Profits

*Standard errors (in parentheses) clustered at firm level. *** p<0.001, ** p<001, * p<0.05*

UK Firm-Level Results

- Positive rent sharing, elasticity .012.
- Strong decline since 1980s (.04) until today (.01).
- Robust to the exclusion of small companies, and oil and financial sectors.
- Results not affected by the use of industry-level instruments. more
- Similar results for the UK Manufacturing companies with domestic operation (ARD/ABS). more

The US Manufacturing Industries - Empirical Specification

- 459 US manufacturing industries 1963-2011 from NBER-CES Manufacturing Industry Database.

$$w_{jt} = \alpha w_{jt-1} + \sum_{l=0}^{L} \beta_l \pi_{jt-l} + \sum_{l=0}^{L} \gamma_l U_{t-l} + \sum_{l=0}^{L} \delta_l \overline{w}_{jt-l} + \mu_j + f(time) + \epsilon_{jt}$$

- U_t - log of nationwide unemployment (BLS).
- $\overline{w}_{jt}$ - log of **2-digit** industry average wages (CPS).

The US Manufacturing Industries, Sub-Periods

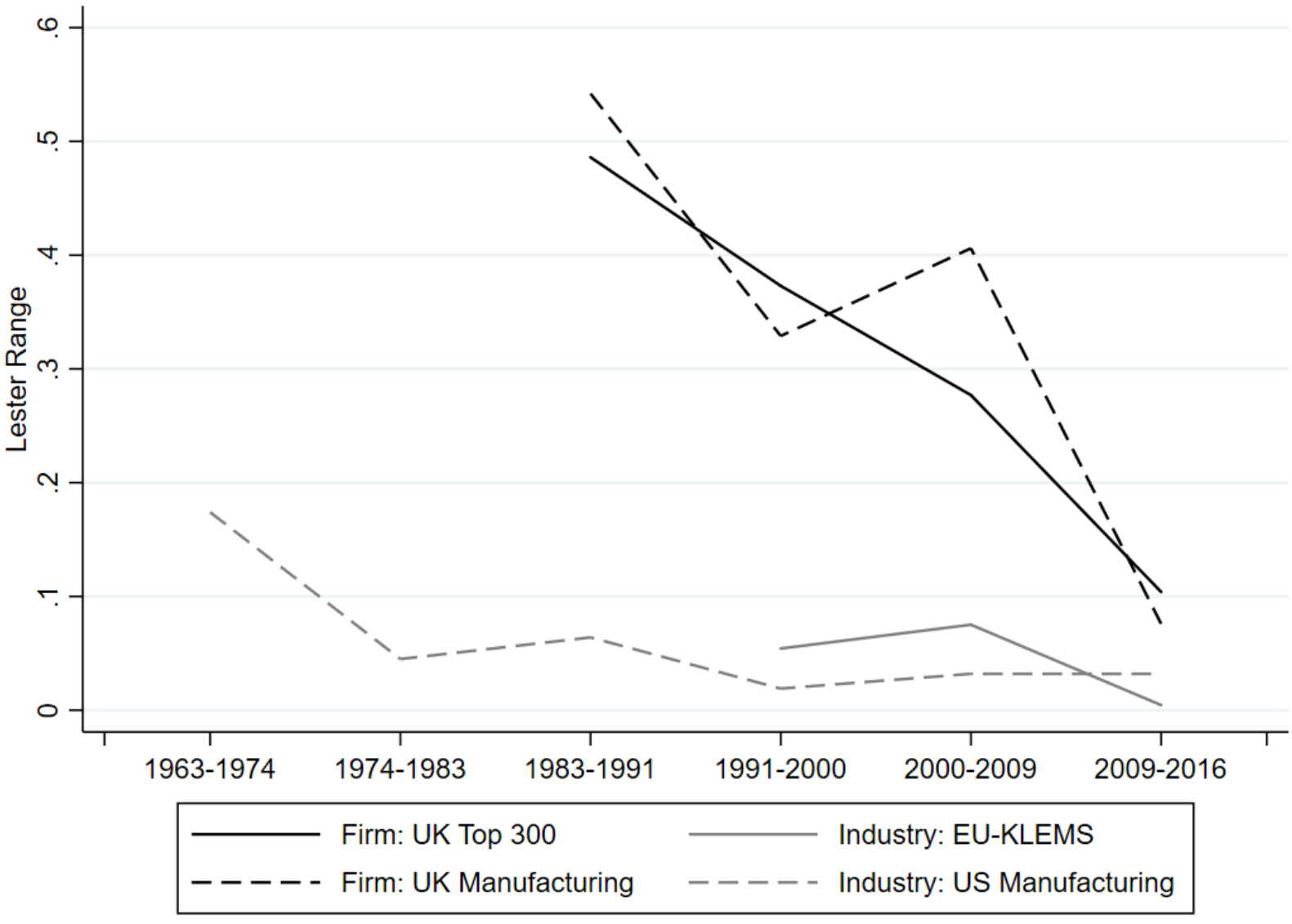
	Dependent Variable: Log w_{ijt}					
	(1)	(2)	(3)	(4)	(5)	(6)
	1963-2011	1963-1974	1974-1983	1983-1991	1991-2000	2000-2011
Log w_{ijt-1}	0.729***	0.362***	0.606***	0.382***	0.506***	0.508***
	(0.016)	(0.044)	(0.029)	(0.049)	(0.028)	(0.031)
π/n_{ijt}	0.005**	0.037***	0.010***	0.012***	0.008***	0.005***
	(0.002)	(0.009)	(0.004)	(0.003)	(0.003)	(0.002)
π/n_{ijt-1}	0	-0.001	-0.004	-0.010***	-0.005	0.001
	(0.002)	(0.009)	(0.004)	(0.004)	(0.004)	(0.002)
π/n_{ijt-2}	-0.003	-0.010**	-0.001	0.004	-0.002	-0.005*
	(0.001)	(0.005)	(0.003)	(0.002)	(0.003)	(0.003)
π/n_{ijt-3}	0.001	0.009**	-0.001	0.003	0.001	0.001
	(0.001)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)
LR Coefficient	**0.014**	**0.054**	**0.013**	**0.014**	**0.004**	**0.005**
	(0.005)	(0.019)	(0.012)	(0.004)	(0.008)	(0.004)
Lester Range	**0.082**	**0.174**	**0.045**	**0.064**	**0.019**	**0.032**
Industry-Years	21004	4590	4590	4130	4550	4972
Industries	459	459	459	459	458	452
Time	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)

*Standard errors (in parentheses) clustered at industry level. *** p<0.001, ** p<001, * p<0.05*

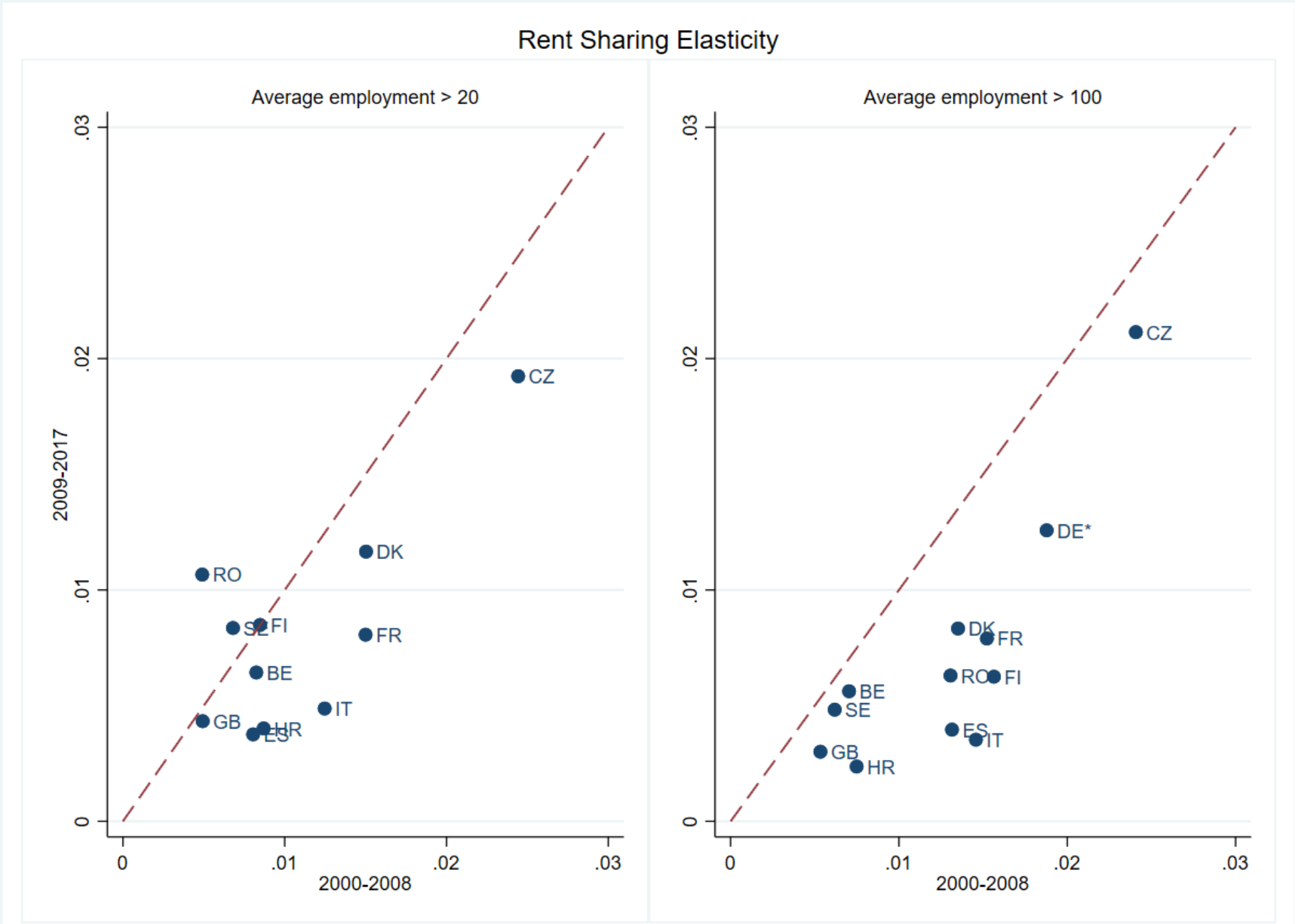
Industry-Level Results

- Strong decline for the US manufacturing since the 1960s (.05) until today (0).
- Similar decline for the EU industries since the 1990s (.002) until today (0). more

Lester Range Estimates



Bukowski, Machin & Soskice (2019): Rent Sharing by Country

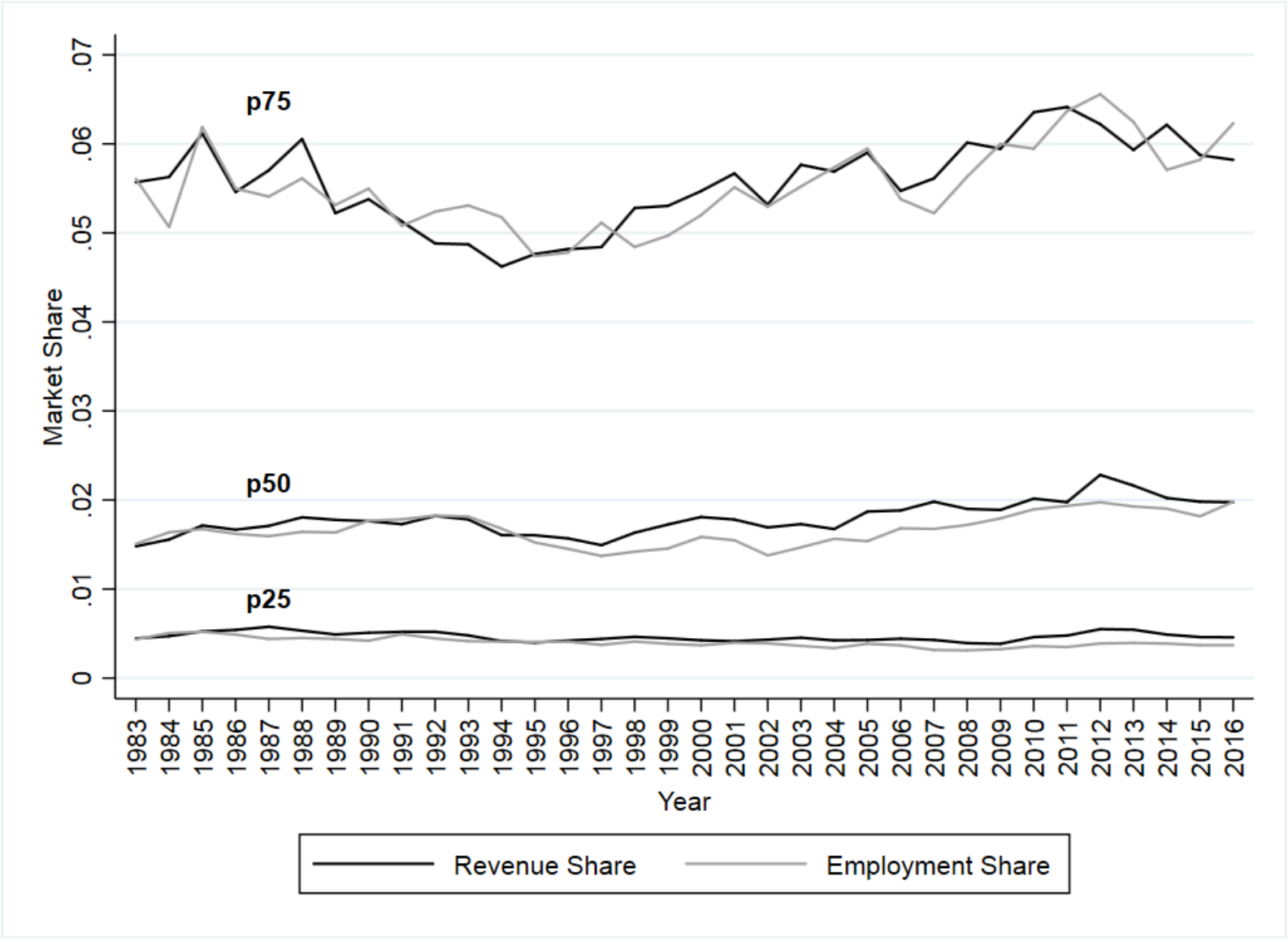


Market Power

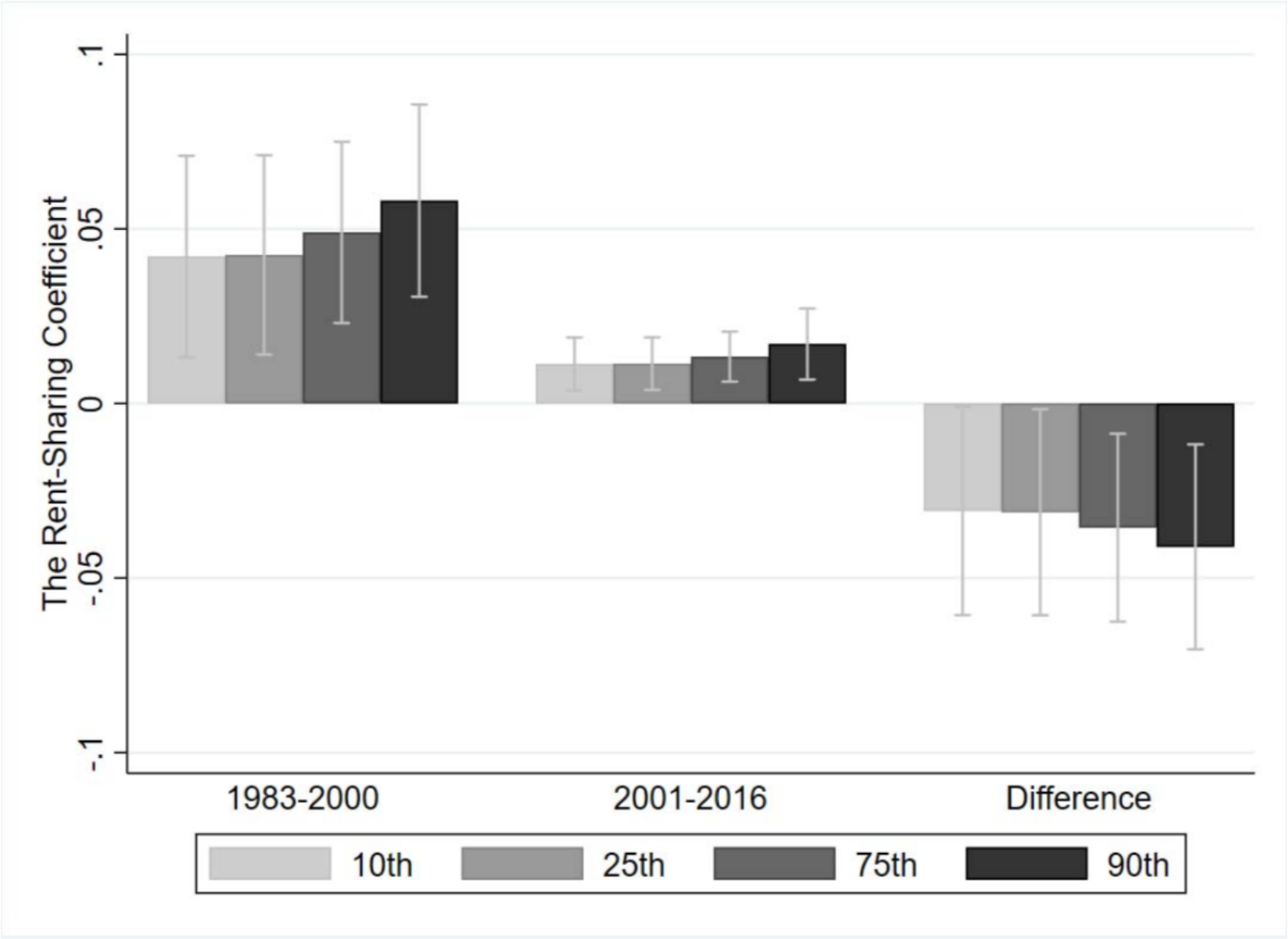
- Link between market power and labour share (Benmelech et al., 2018; Autor et al., 2017; Adrjan 2018). Do companies with high market power share more or less of their profits?
- We use the data on the UK-domiciled companies (the Top 300 sample) and measure market power as a firm's revenue and employment share in the sample's industry total.

$$w_{ijt} = \alpha w_{ij-1} + \sum_{l=0}^{L} \beta_l \pi_{ijt-l} + \sum_{l=0}^{L} \theta_l mshare_{ijt-l} + \sum_{l=0}^{L} \delta_l \overline{w}_{jt-l} + \\ + \sum_{l=0}^{L} \gamma_l \pi_{ijt-l} \times mshare_{ijt-l} + \mu_i + \mu_t + \epsilon_{ijt}$$

Measures of Market Power



Revenue Share



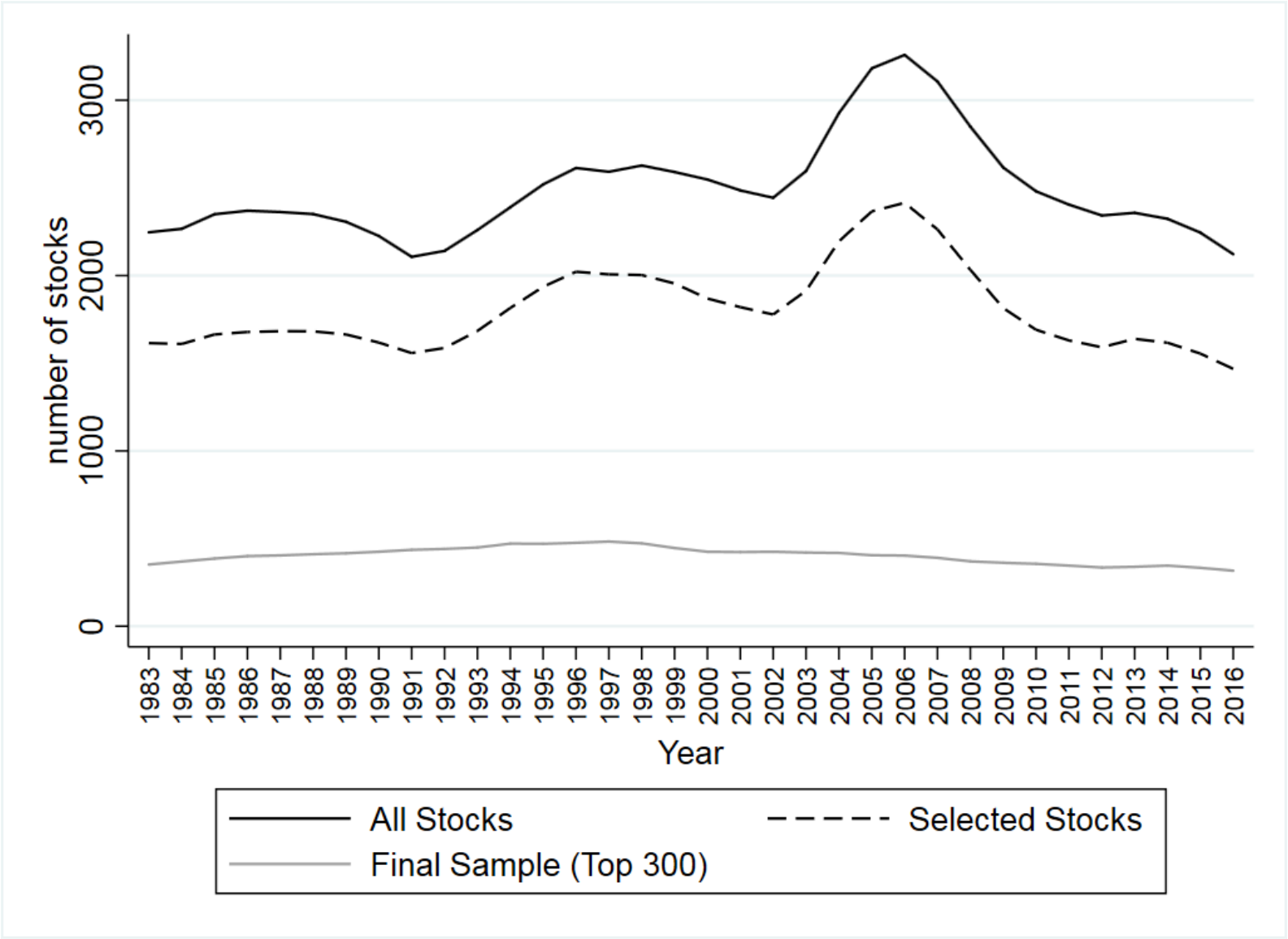
Conclusions

- Main results:
  - The evidence of rent sharing...
  - ...but its magnitude has fallen.
  - A positive association between market power and rent-sharing, but weaker after 2000.
- Potential implications:
  - Less inclusive growth.
  - Weaker position of workers (see also robocalypse).
  - More competitive labour market.

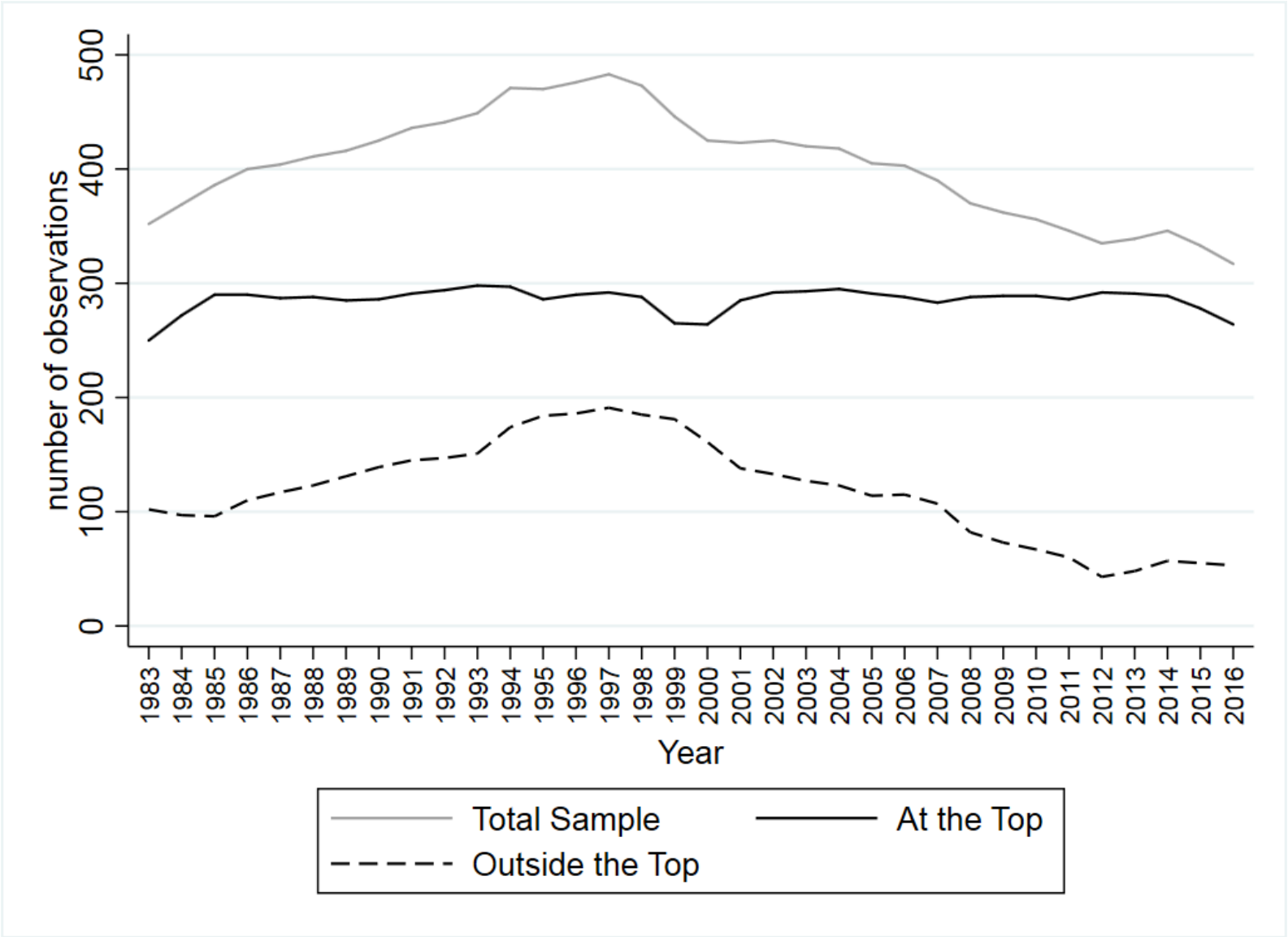
Existing Empirical Evidence

- US Industry-level estimates:
  - Elasticity of wages with respect to profits between **.01** and **.06** (Katz and Summers, 1989; Blanchflower et al., 1996; Estavao and Tevlin, 2003).
- UK Firm-level estimates:
  - **.07-.09** (Nickell and Wadhwani, 1990; Nickell et al., 1994), **.11** (Van Reenen, 1996), **.02 -.03** (Hildreth and Oswald, 1997; Hildreth, 1998).
- Employee-employer matched data:
  - Portugal: **.03 -.09** (Cardoso and Portela, 2009; Martins, 2009; Card et al., 2016). Italy: **.06 - .08** (Guiso et al., 2005; Card et al., 2014), **.02 -.03** (Hildreth and Oswald, 1997; Hildreth, 1998). Similar elasticities reported for France (Margolis and Salvanes, 2001; Fakhfakh and FitzRoy, 2004), Germany (Guertzgen, 2009) and Sweden (Arai, 2003; Arai and Hayman, 2009; Carlsson, Messina and Skans 2014).

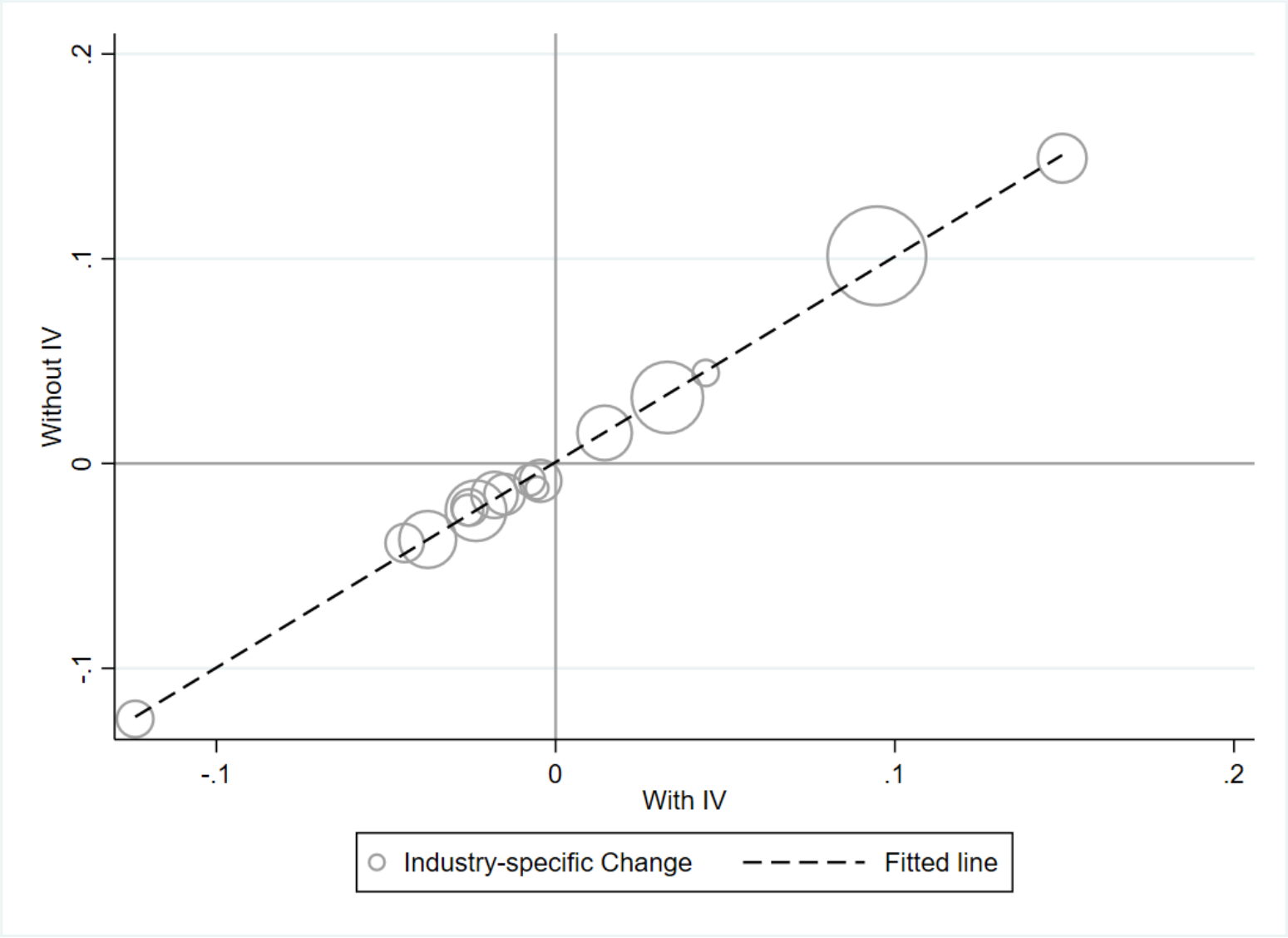
The Number of Stocks Listed on the LSE



Decomposition of the Top 300 Sample



The UK-domiciled Companies, IV



The UK Manufacturing Companies

- One should interpret the above results as evidence for UK-domiciled companies, since many firms in our sample have operations extending beyond the border.
- We complement it with a similar analysis of domestic operations from the panel of UK manufacturing companies from ARD/ABS for 1983-2016.

$$w_{irt} = \alpha w_{ir-1} + \sum_{l=0}^{L} \beta_l \pi_{irt-l} + \sum_{l=0}^{L} \gamma_l U_{rt-l} + \sum_{l=0}^{L} \delta_l \overline{w}_{rt-l} + \\ + \mu_i + f(time) + \epsilon_{irt}$$

- i stands for firm, r for region and t for time.
- U_{rt} - regional unemployment from LFS,
- $\overline{w}_{rt}$ - regional average wages from NES/ASHE.

The UK Manufacturing Companies, Sub-Periods

	Dependent Variable: Log w_{irt}					
	(1)	(2)	(3)	(4)	(5)	(6)
	1983-2016	1983-2016	1983-1991	1991-2000	2000-2009	2009-2016
Log w_{irt-1}	0.372***	0.370***	0.466***	0.365***	0.174***	0.239***
	(0.027)	(0.037)	(0.04)	(0.034)	(0.062)	(0.042)
π/n_{irt}	0.0150***	0.0135***	0.058**	0.042***	0.014*	0.016
	(0.012)	(0.007)	(0.026)	(0.014)	(0.007)	(0.011)
π/n_{irt-1}	0.0022	0.00251	-0.013	-0.001	0.009	-0.002
	(0.01)	(0.006)	(0.022)	(0.012)	(0.007)	(0.008)
π/n_{irt-2}	-0.00942**	0.00982**	-0.014**	-0.021***	-0.008	-0.004
	(0.004)	(0.004)	(0.006)	(0.006)	(0.005)	(0.006)
π/n_{irt-3}	0.00177	0.00159	0.006	0.003	0.012**	-0.005
	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)	(0.005)
LR Coefficient	**0.015**	**0.012**	**0.069**	**0.037**	**0.033**	**0.007**
	(0.008)	(0.008)	(0.054)	(0.03)	(0.015)	(0.02)
Lester Range	**0.18**	**0.15**	**0.542**	**0.329**	**0.406**	**0.076**
Firm-Years	27250	27250	13,374	9,164	3,700	3,108
Firms	2797	2797	2,058	1,606	841	619
Time	Quad	Year FE	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)

*Standard errors (in parentheses) clustered at firm level. *** p<0.001, ** p<001, * p<0.05*

The EU Industries - Empirical Specification

- EUKLEMS data allow us to look at domestic operation over the entire economy for the numerous EU countries (AT, DE, DK, ES, FI, FR, IT, NT, UK).
- For each country, the panel consists of 25 years of data for 28 industries.

$$\overline{w}_{jct} - \overline{w}_{jct-l} = \beta_l(\pi_{jct} - \pi_{jct-l}) + FE + \epsilon_{jct}$$

- j stands for industry, c for country and t for time.
- Two periods: 1991-2005, 2005-2015
- FE are industry or country fixed effects.

The EU Industries, Sub-Periods

	Dependent variable : Log w_{ijt} - Log w_{ijt-i}			
	(1)	(2)	(3)	(4)
		1991-2005		
$(\pi/n)_{ij2005}$ - $(\pi/n)_{ij1991}$	0.0019***	0.0015***	0.0017***	0.0012***
	(0.0001)	(0.0001)	(0.0003)	(0.0003)
Lester Range	5%	4%	5%	3%
		2005-2015		
$(\pi/n)_{ij2015}$ - $(\pi/n)_{ij2005}$	-0.0003	-0.0003	-0.0001	-0.0001
	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Lester Range	0%	0%	0%	0%
Observations	255	255	255	255
Country FE	No	Yes	No	Yes
Industry FE	No	No	Yes	Yes

*Standard errors (in parentheses) clustered at industry level. *** p<0.001, ** p<001, * p<0.05*