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Micro mechanisms behind declining labor shares: market power, production processes, and global competition

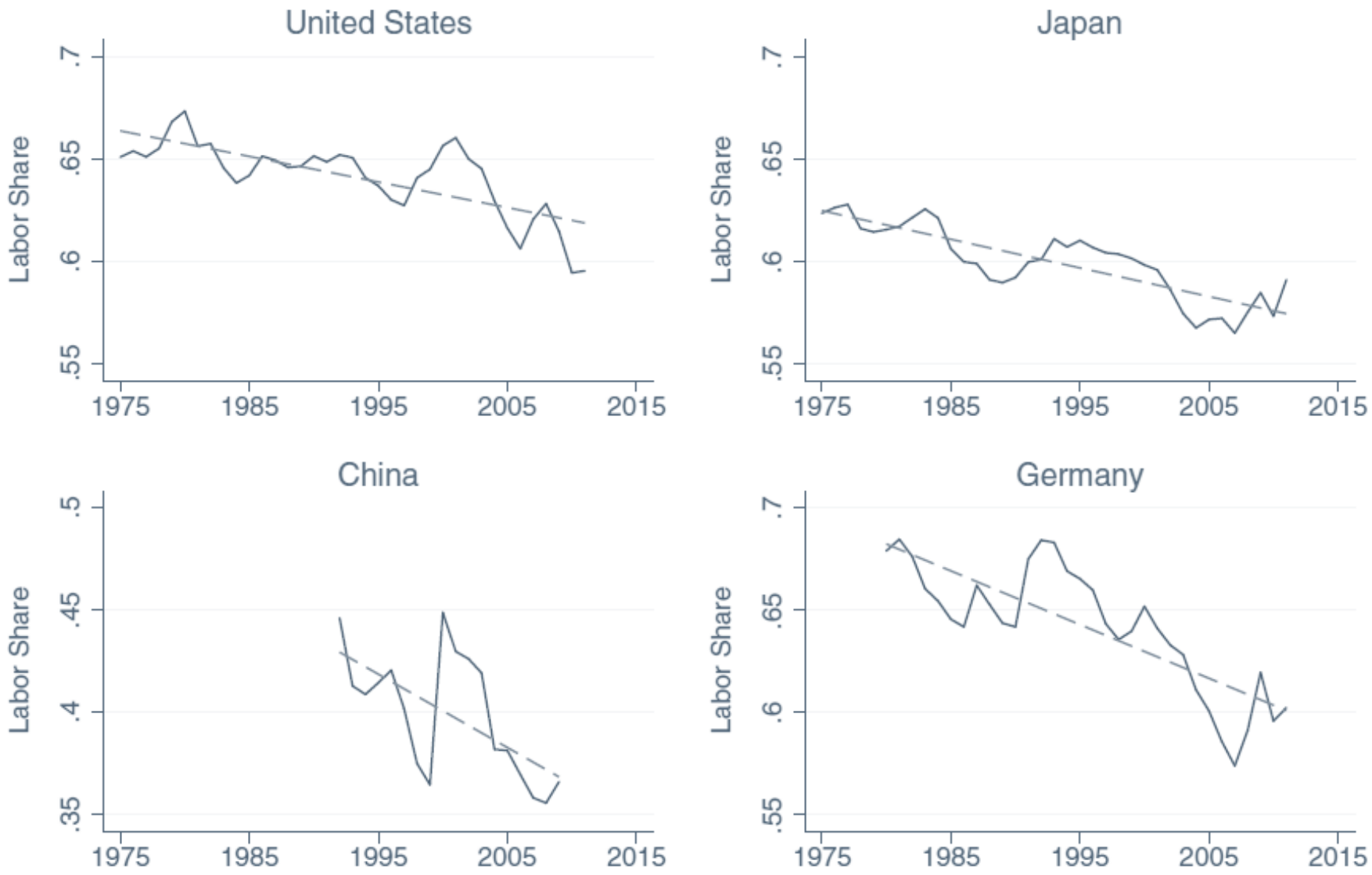


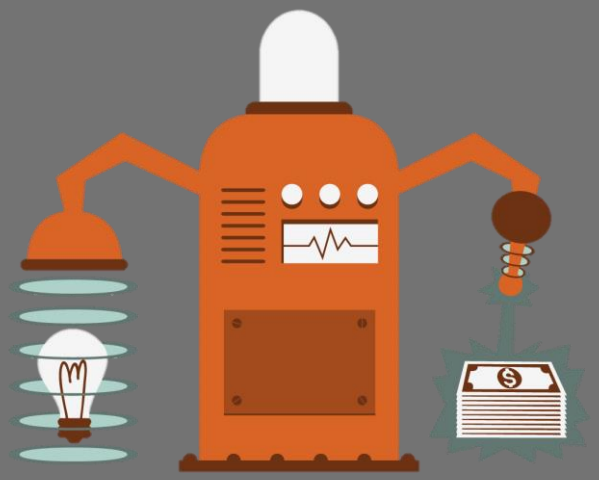
FIGURE II

Declining Labor Share for the Largest Countries

KARABARBOUNIS & NEIMAN (2013)

Distributional consequences?

meaning of work in our society?



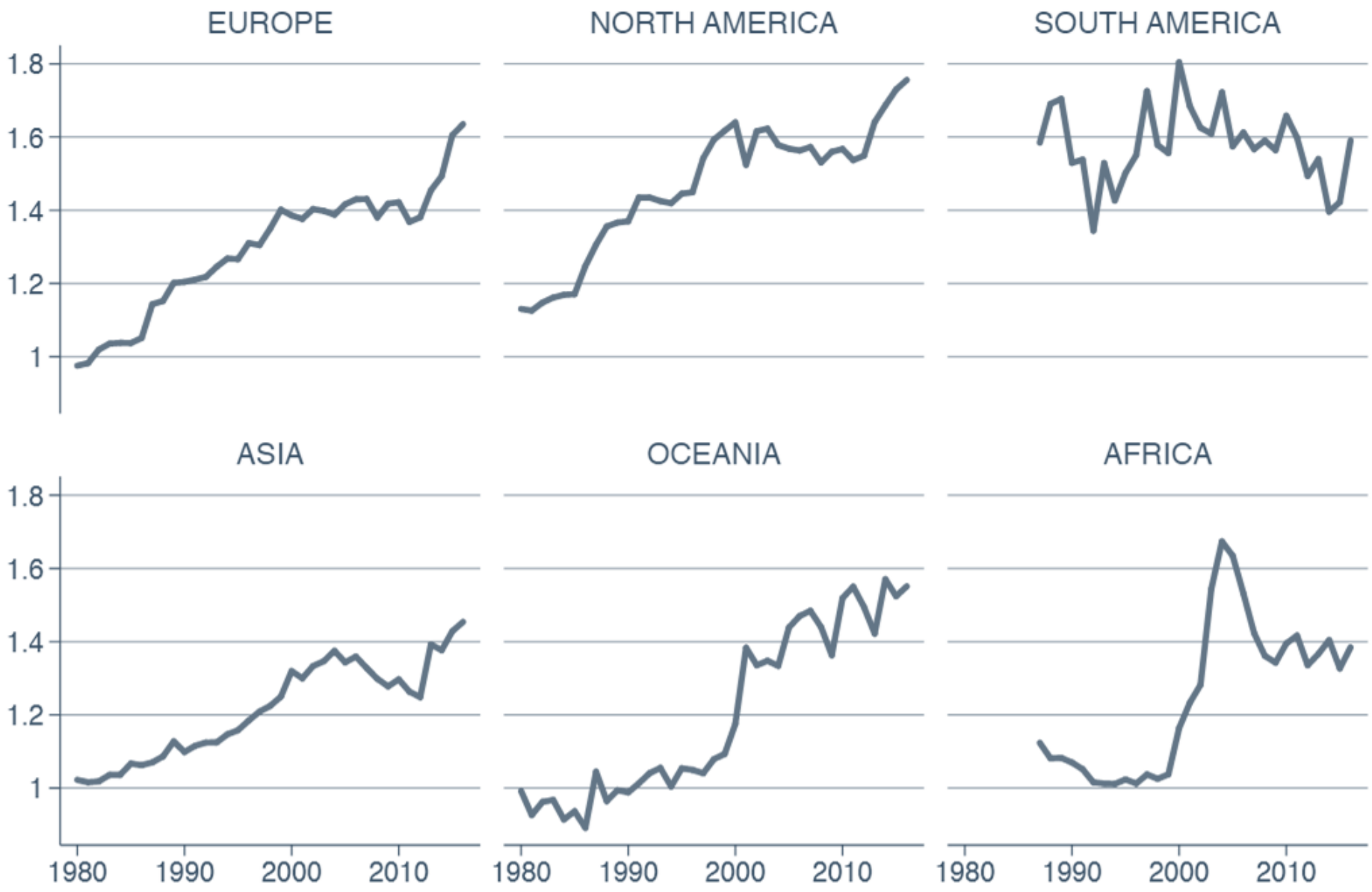
theory (khaldor 1957,1961)

$$Y = A * K^{\alpha} L^{\beta}$$

Inconsistent?

?

- Global integration
  (Eslby et al. (2013)
- Importance of capital ↑ (ICT)
  (Karabarbounis, Neiman (2013), Koh et al. (2016)
- Decline of labor institutions
  Blanchard, Giavazzi (2003)
- Rise of (product) Market Power
  Barkai (2016); Autor et al. (2017); De Loecker, Eeckhout (2018)



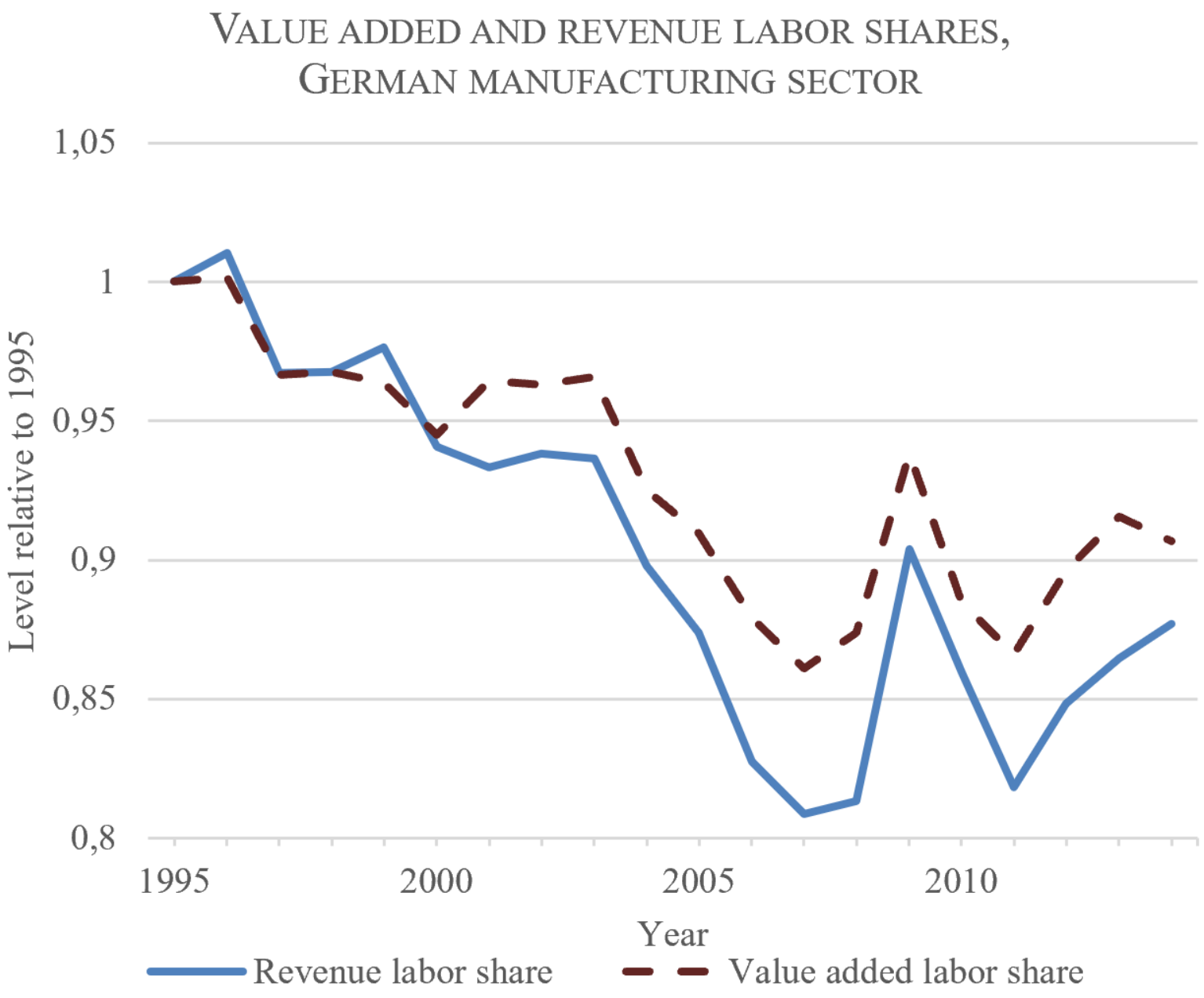
GLOBAL MARKUPS

SOURCE: DE LOECKER & EECKHOUT (2018)

What do I do?

- Link labor shares to firms' product and labor market power and labor's output elasticity
- Analyze movements of those parameters with micro-data
- Can market power explain the fall in labor's share?
- Investigate role of international competition

Administrative Firm-Product-level Data German manufacturing sector 1995-2014


Value added and revenue labor shares,
German manufacturing sector
1,05
1
0,95
0,9
0,85
0,8
Level relative to 1995
1995
2000
2005
2010
Year
Revenue labor share
Value added labor share

Methodology

Similar to Dobbelaere & Mairesse (2013);

Dobbelaere & Kiyota (2018);

De Loecker, Eeckhout, & Unger (2018)

production:

$$Q_{it}(.) = Q_{it}(L_{it}, M_{it}, K_{it}, \omega_{it})$$

Labor market power:

$$(1 + \tau_{it}^{L}) = \frac{w_{it}}{MRPL_{it}}$$

$\tau_{it}^{L} < 0 \rightarrow$ Firm LMP

$\tau_{it}^{L} > 0 \rightarrow$ workforce LMP

SOURCES OF LABOR MARKET POWER

Firm concentration

Hiring / firing costs

Trade unions

Information frictions

Moving costs

Labor market power:

$$(1+\tau_{it}^{L}) = \frac{w_{it}}{MRPL_{it}}$$

contains information on output market power, μ_{it}

$$\mu_{it} = \theta_{it}^{L} * \frac{P_{it}Q_{it}}{w_{it}L_{it}}(1+\tau_{it}^{L})$$

output market power à la De Loecker & Warzynski (2012)

$$\mu_{it} = \theta_{it}^{M} * \frac{P_{it}Q_{it}}{z_{it}M_{it}}$$

$$\theta_{it}^{M} * \frac{P_{it}Q_{it}}{z_{it}M_{it}} = \theta_{it}^{L} * \frac{P_{it}Q_{it}}{w_{it}L_{it}}\left(1+\tau_{it}^{L}\right)$$

$$\downarrow$$

Firm's LMP $\rightarrow$ $$\gamma_{it} = \frac{1}{\left(1+\tau_{it}^{L}\right)} = \frac{\theta_{it}^{L}}{\theta_{it}^{M}} * \frac{z_{it}M_{it}}{w_{it}L_{it}}$$

Dobbelaere & Mairesse (2013):

$$\gamma_{it} = \theta_{it}^{M}\frac{P_{it}Q_{it}}{z_{it}M_{it}} - \theta_{it}^{L}\frac{P_{it}Q_{it}}{w_{it}L_{it}}$$

$$\mu_{it} = \theta_{it}^{L} * \frac{P_{it}Q_{it}}{w_{it}L_{it}}\left(1+\tau_{it}^{L}\right)$$

$$\downarrow$$

$$LS_{it} = \frac{w_{it}L_{it}}{P_{it}Q_{it}} = \frac{\theta_{it}^{L}}{\mu_{it}\gamma_{it}}$$

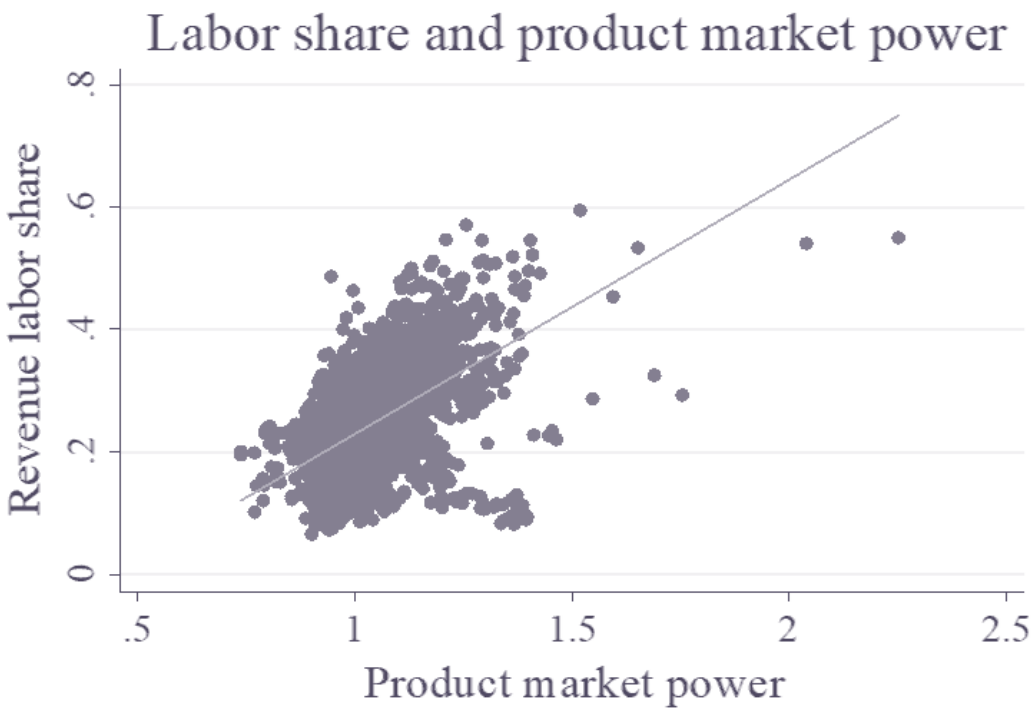
De Loecker & Eeckhout (2018):

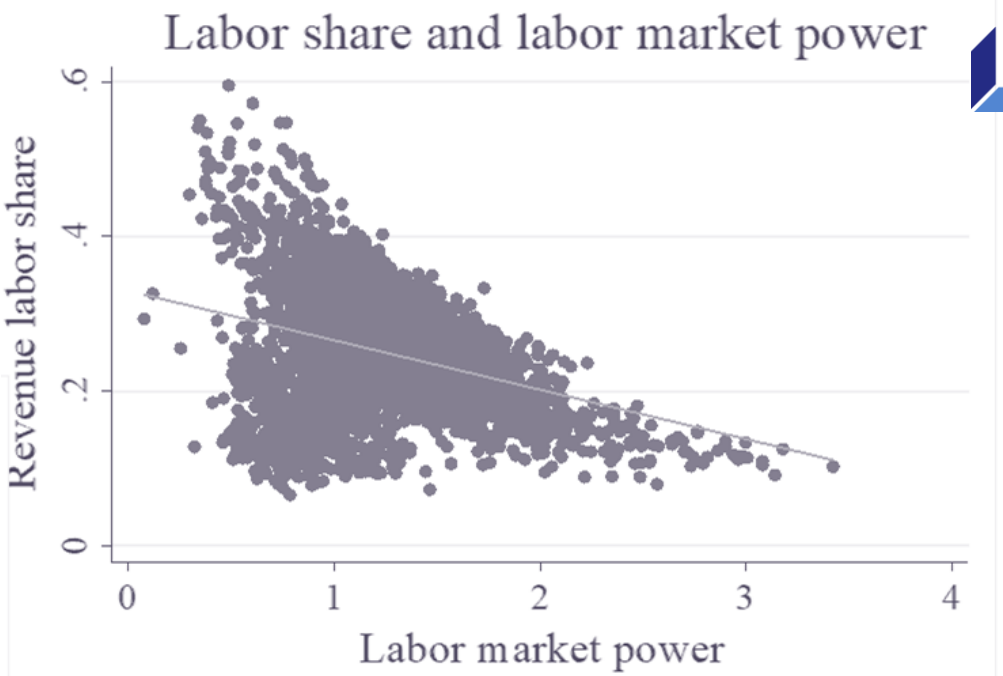
$$LS_{it} = \frac{\theta_{j}^{L}}{\mu_{it}^{DLE}}, with\ \mu_{it}^{DLE} = f(\mu_{it}, \gamma_{it})$$

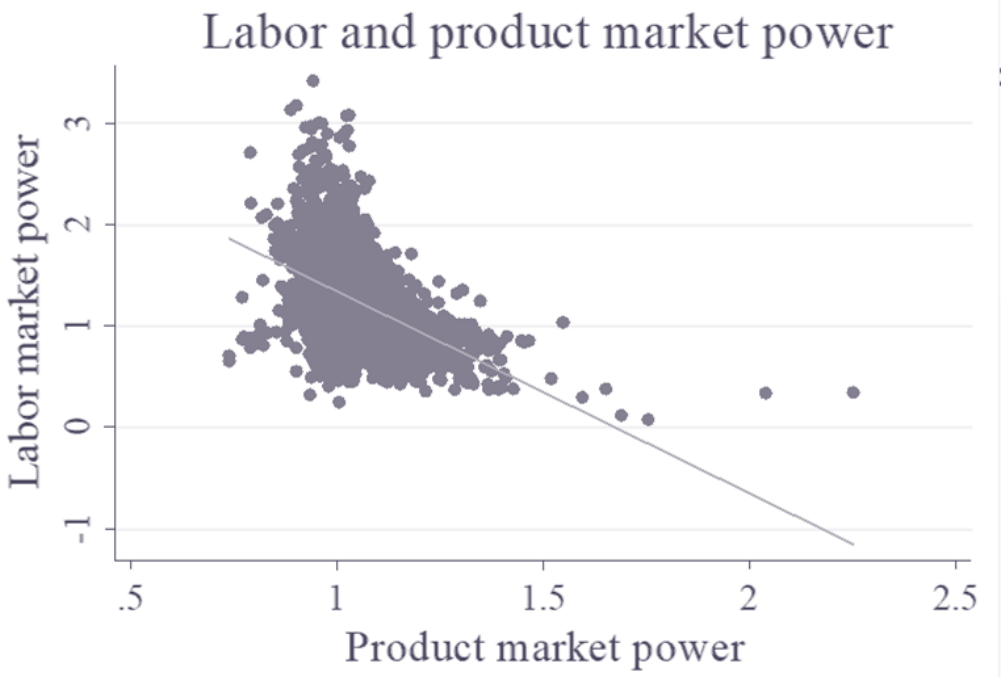
Labor shares, market power, and labor output elasticities

$$LS_{it} = \frac{\theta_{it}^{L}}{\mu_{it}\gamma_{it}}$$

Panel A: Firm-level	LS_{it}^{GO} (1)	LS_{it}^{GO} (2)	LS_{it}^{GO} (3)
θ_{it}^{L}	0.425*** (0.00407)	0.623*** (0.00624)	0.987*** (0.00180)
μ_{it}	1.865*** (0.0144)	1.465*** (0.0161)	-0.914*** (0.00822)
γ_{it}	-	-	-0.979*** (0.00212)
Time FE	NO	YES	NO
Firm * Industry FE	NO	YES	NO
Observations	177,934	170,475	177,934
R-squared	0.591	0.952	0.940
Number of firms	37,903	31,022	37,903


Labor share and product market power
Revenue labor share
0
.2
.4
.6
.8
.5
1
1.5
2
2.5
Product market power


Labor share and labor market power
Revenue labor share
0
.2
.4
.6
0
1
2
3
4
Labor market power


Labor and product market power
Labor market power
-1
0
1
2
3
.5
1
1.5
2
2.5
Product market power

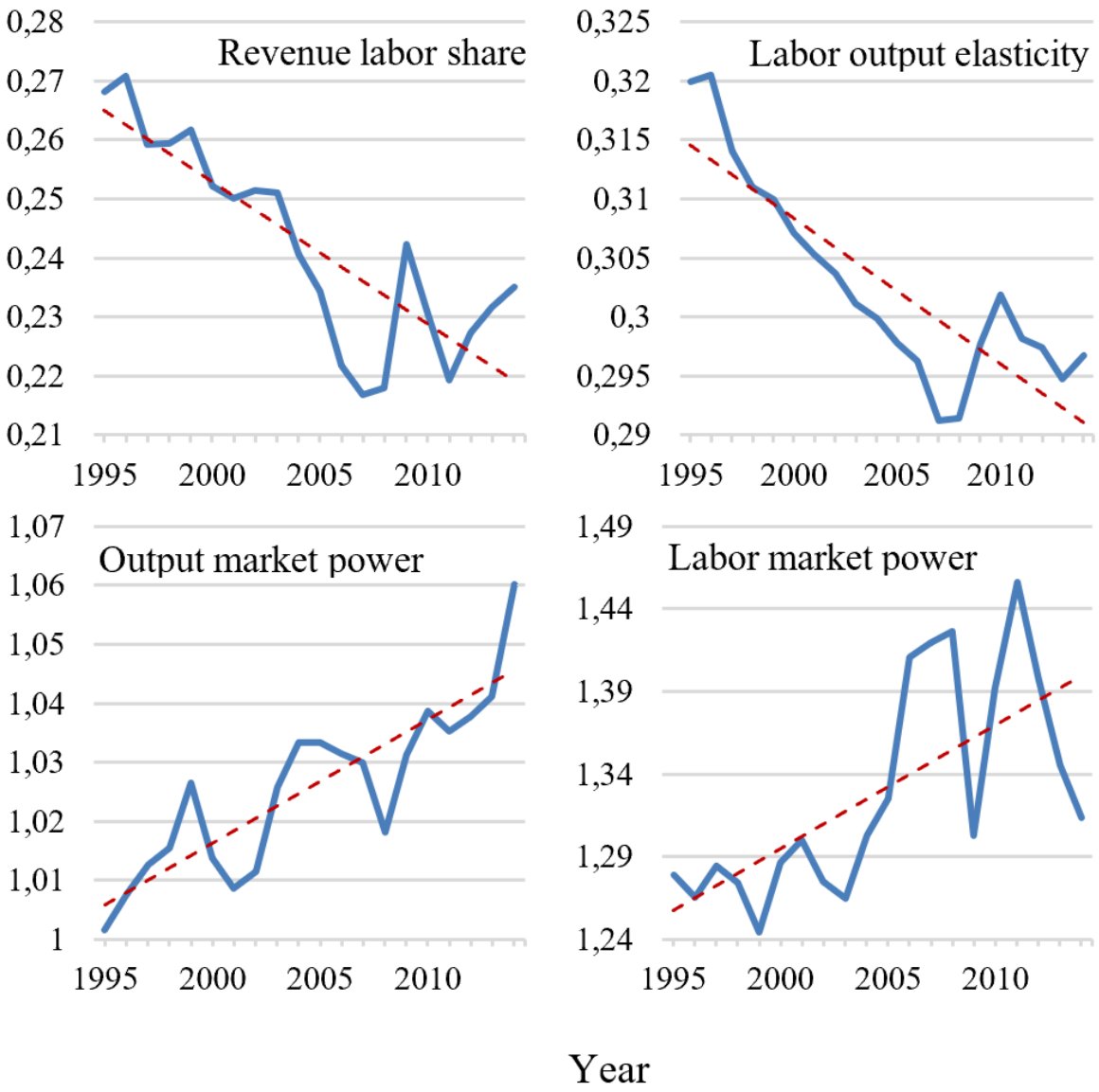
Decomposition

$$LS_{it} \equiv \frac{\sum w_{it} L_{it}}{\sum P_{it} Q_{it}} = \sum \left(\frac{P_{it} Q_{it}}{\sum P_{it} Q_{it}} * \frac{w_{it} L_{it}}{P_{it} Q_{it}} \right)$$

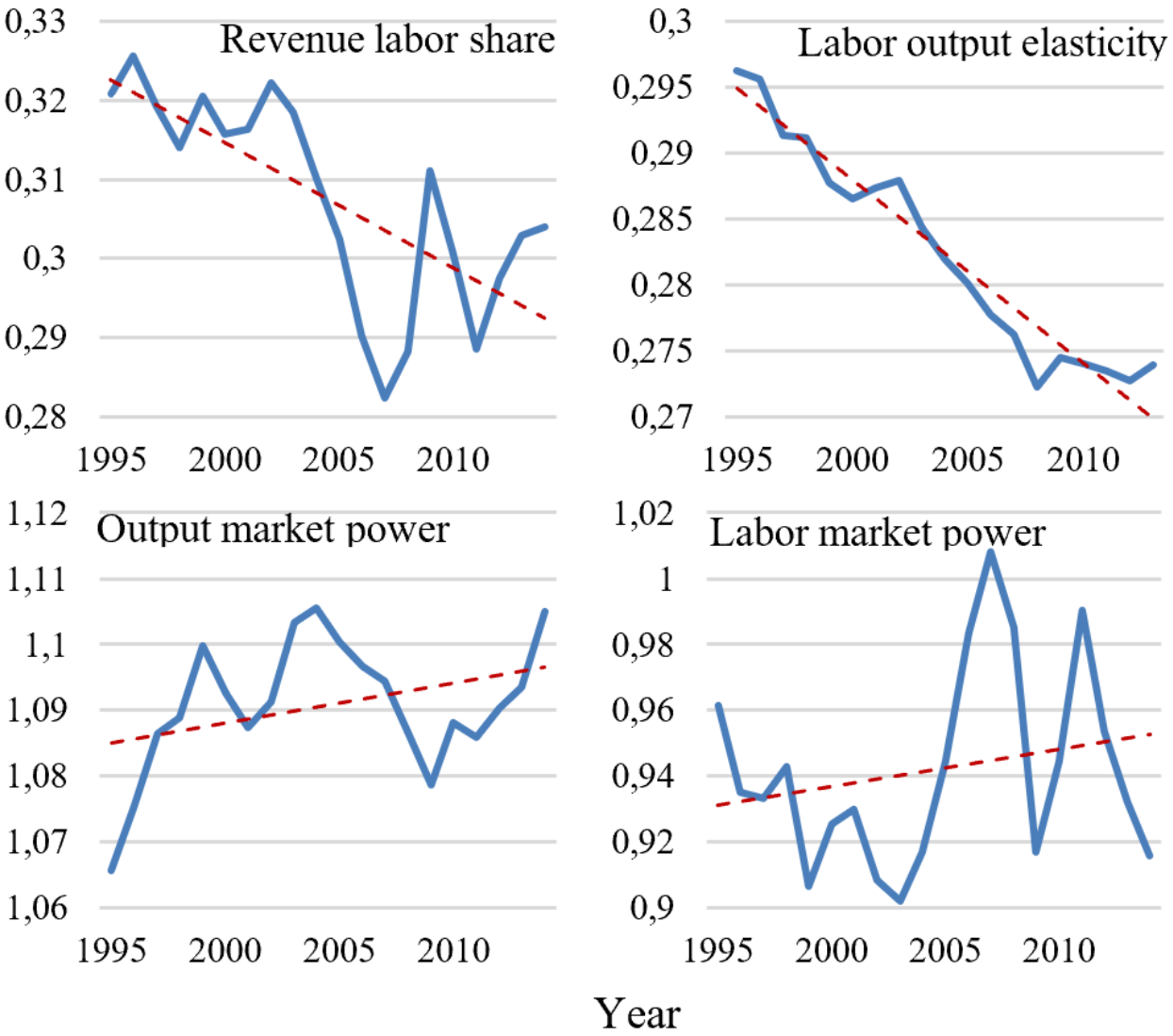
$$LS_{jt} = \underbrace{\overline{LS}_{jt}}_{\text{within}} + \underbrace{cov_{jt}\left(\frac{P_{it} Q_{it}}{\sum P_{it} Q_{it}}, LS_{it}\right)}_{\text{between}}$$

Weighted averages

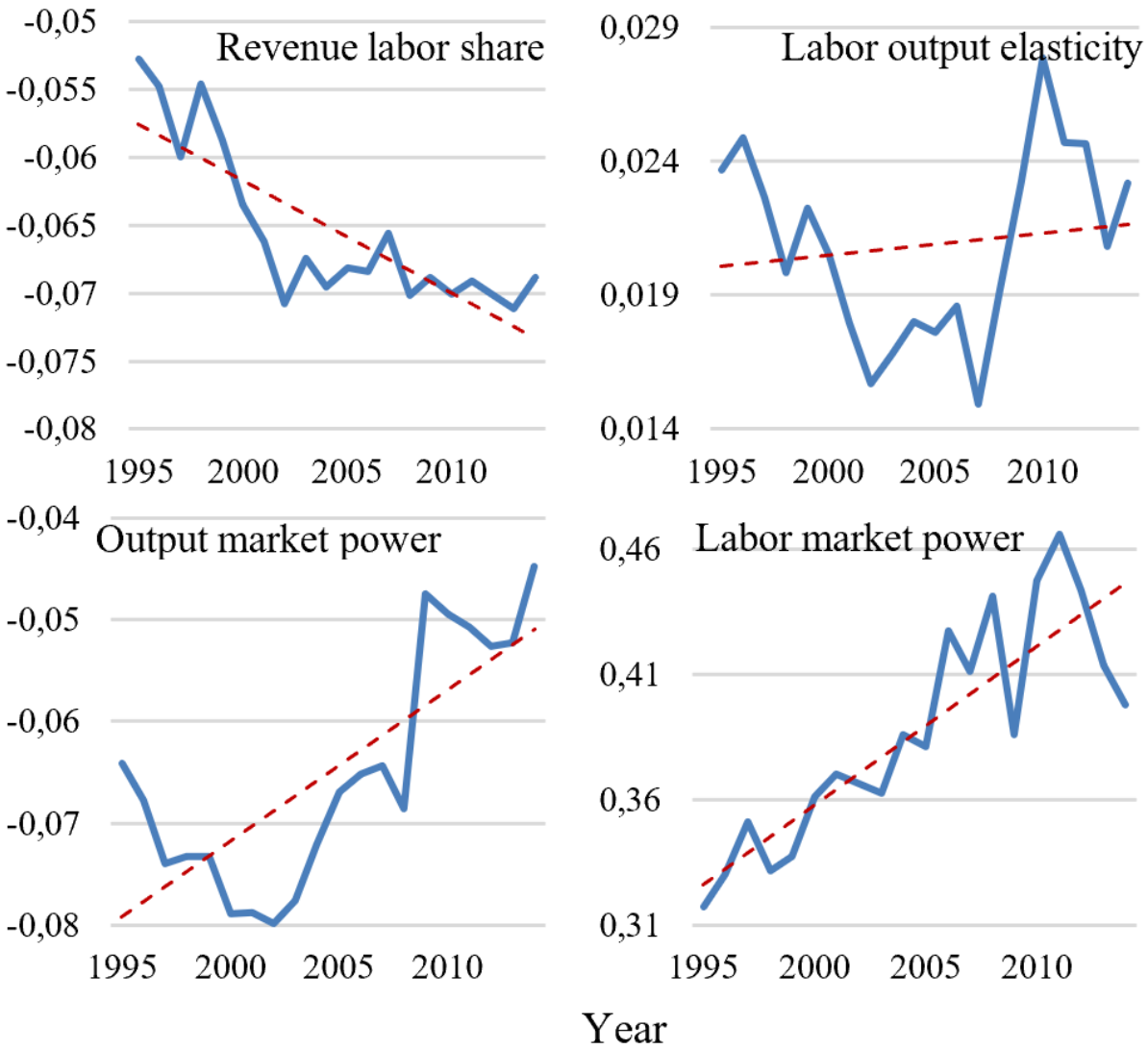
Revenue labor share and its components



Panel A: Within firm changes



Panel B: Between firm changes

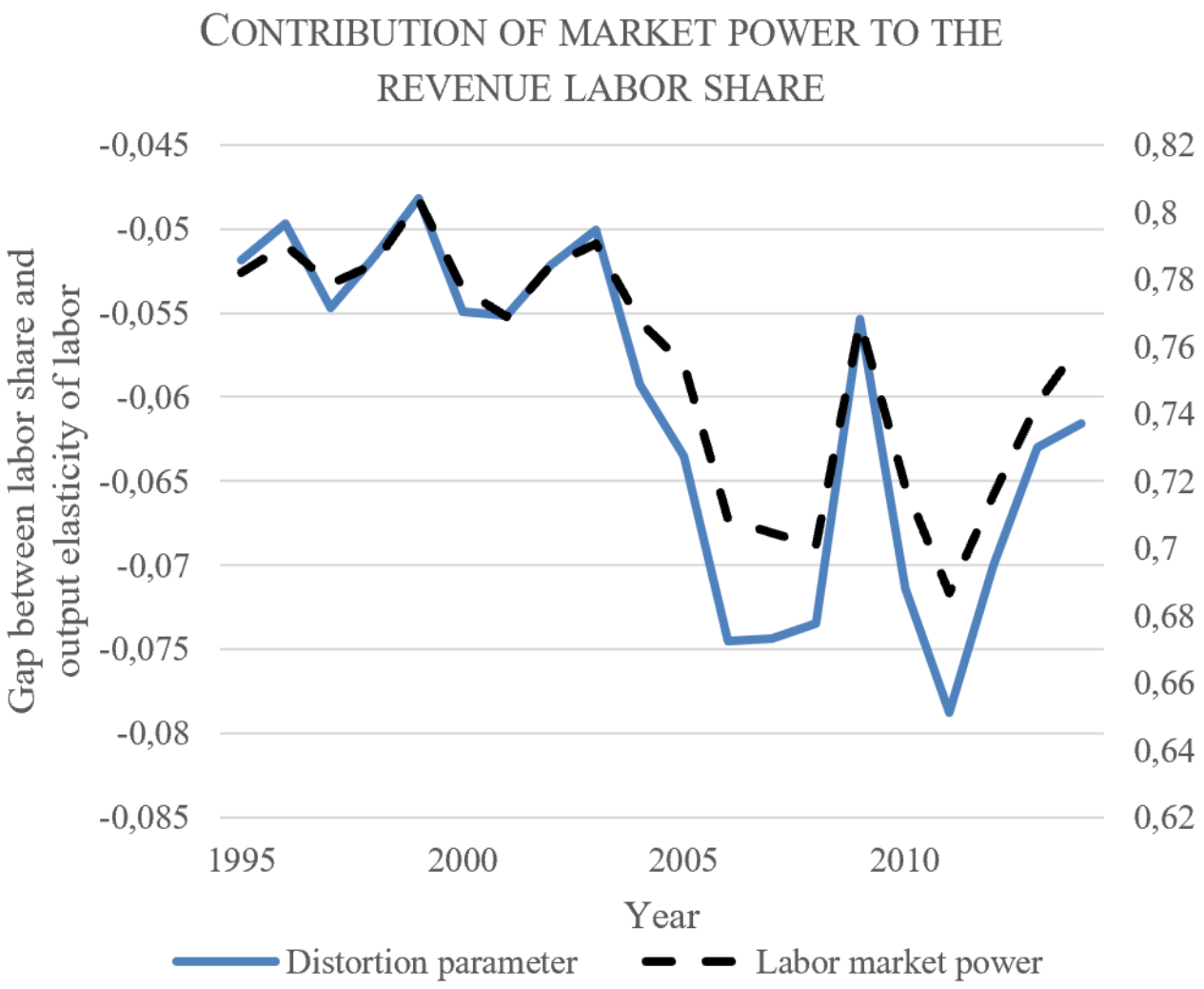


Market power distortion

$$LS_{it}^{GO} = \frac{\theta_{it}^{L}}{\mu_{it}\gamma_{it}}$$

$$\mu_{it} = \gamma_{it} = 1$$

$$LS_{it}^{GO} - \theta_{it}^{L} = \varphi_{it}$$



MARKET POWER DISTORTIONS ACCOUNT FOR 30% OF CHANGE BETWEEN 1995 AND 2014

$$IM_{it}^{CHN} = \sum_{g} \frac{P_{git}Q_{git}}{\sum P_{git}Q_{git}} * \frac{M_{gt}^{CHN \to GER}}{M_{gt} + Y_{gt}} * 100$$

$$EXP_{it}^{CHN} = \sum_{g} \frac{P_{git}Q_{git}}{\sum P_{git}Q_{git}} * \frac{E_{gt}^{GER \to CHN}}{M_{gt} + Y_{gt}} * 100$$

$$\ln(y_{it}) = \beta_{IMP} IMP_{it-1}^{CHN} + \beta_{EXP} EXP_{it-1}^{CHN} + \boldsymbol{C}'_{it-1}\boldsymbol{\beta} + \vartheta_t + \vartheta_{ij},$$

$$Instrument\_Imports_{it}^{CHN} = \sum_{g} \frac{P_{git}Q_{git}}{\sum P_{git}Q_{git}} * \frac{M_{gt}^{CHN \to OTHER}}{M_{gt}^{WORLD \to OTHER}} * 100$$

$$Instrument\_Exports_{it}^{CHN} = \sum_{g} \frac{P_{git}Q_{git}}{\sum P_{git}Q_{git}} * \frac{E_{gt}^{OTHER \to CHN}}{E_{gt}^{OTHER \to WORLD}} * 100$$

TRADE AND VARIABLES OF INTEREST

	OLS				IV			
	LS_{it}^{GO} (1)	θ_{it}^{L} (2)	μ_{it}^{M} (3)	γ_{it} (4)	LS_{it}^{GO} (5)	θ_{it}^{L} (6)	μ_{it}^{M} (7)	γ_{it} (8)
IMP_{it-1}^{CHN}	0.00223***	-0.00068	0.00052***	-0.00314***	0.00260***	-0.00087	-0.00004	-0.00403***
	(0.000500)	(0.000489)	(0.000180)	(0.000600)	(0.000868)	(0.000745)	(0.000288)	(0.000884)
EXP_{it-1}^{CHN}	-0.00179**	-0.00055	0.00114***	0.00001	-0.00667***	0.00180	0.00006	0.00794***
	(0.000737)	(0.000423)	(0.000251)	(0.000544)	(0.00251)	(0.00167)	(0.000823)	(0.00233)
Firm x Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm-level controls	YES	YES	YES	YES	YES	YES	YES	YES
Observations	114,040	114,040	114,040	114,040	114,040	114,040	114,040	114,040
R-squared	0.915	0.952	0.898	0.938	0.915	0.952	0.898	0.938
First-stage F-test	-	-	-	-	106.90	106.90	106.90	106.90
Number of firms	22,632	22,632	22,632	22,632	22,632	22,632	22,632	22,632

Notes: Table 4 reports results from estimating equation (18) by OLS and IV. OLS-results are reported in columns 1-4. IV-results are reported in columns 5-8. The dependent variable in columns 1-4 and 5-8 are respectively the revenue labor share, the output elasticity of labor, the output market power parameter, and the labor market power parameter. All regressions include time and industry times firm fixed effects and controls for the firm's number of products, capital over labor ratio, and value added over revenue ratio. Standard errors are clustered at the firm-level. Significance: *10 percent, **5 percent, ***1 percent.

Summary statistics, exporter vs. non-exporter

Variable	Exporter			Non-exporter		
	Mean (1)	Median (2)	N (3)	Mean (4)	Median (5)	N (6)
Employees	252.82	91	135,696	115.00	59	42,238
Log of value added per employee	16.54	16,42	135,696	15.59	15.43	42,238
Deflated capital per employee in thousands	98,717	73,809	135,696	86,184	51,040	42,238
Deflated intermediates per employee in thousands	94,225	74,785	135,696	64,787	46,692	42,238
Value added over revenue	0.40	0.40	135,696	0.44	0.44	42,238
Average real wage	34,773	34,451	135,696	26,935	26,230	42,238
Revenue labor share	0.30	0.29	135,696	0.33	0.33	42,238
Value added share	0.77	0.75	135,696	0.78	0.77	42,238
Output market power parameter	1.09	1.07	135,696	1.10	1.08	42,238
Labor market power parameter	0.99	0.91	135,696	0.77	0.68	42,238
Output elasticity labor	0.29	0.29	135,696	0.25	0.25	42,238
Returns to scale	1.04	1.04	135,696	0.96	0.95	42,238

Notes: Table 5 reports mean and median values of selected variables separately for exporting and non-exporting firms. Means, medians and the number of observations used to calculate the statistics are respectively reported in columns 1 and 4, 2 and 5, and 3 and 6.

Trade and share of economic activity

Panel A: Exporter	OLS		IV	
	$\frac{L_{it}}{\sum L_{it}}$	$\frac{P_{it}Q_{it}}{\sum P_{it}Q_{it}}$	$\frac{L_{it}}{\sum L_{it}}$	$\frac{P_{it}Q_{it}}{\sum P_{it}Q_{it}}$
	(1)	(2)	(3)	(4)
IMP_{it-1}^{CHN}	-0.00436***	-0.00820***	-0.00859***	-0.0139***
	(0.000870)	(0.00112)	(0.00154)	(0.00195)
EXP_{it-1}^{CHN}	0.00286***	0.00610***	0.0112***	0.0247***
	(0.000941)	(0.00147)	(0.00355)	(0.00472)
Firm x Industry FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Firm-level controls	YES	YES	YES	YES
Observations	88,761	88,761	88,761	88,761
R-squared	0.983	0.982	0.983	0.982
First-stage F-test	-	-	103.40	103.40
Number of firms	17,059	17,059	17,059	17,059

Panel B: Non-exporter	OLS		IV	
	$\frac{L_{it}}{\sum L_{it}}$	$\frac{P_{it}Q_{it}}{\sum P_{it}Q_{it}}$	$\frac{L_{it}}{\sum L_{it}}$	$\frac{P_{it}Q_{it}}{\sum P_{it}Q_{it}}$
	(1)	(2)	(3)	(4)
IMP_{it-1}^{CHN}	-0.00928***	-0.0124***	-0.0124***	-0.0257***
	(0.00226)	(0.00319)	(0.00434)	(0.00636)
EXP_{it-1}^{CHN}	-0.00296	0.00576*	-0.000909	0.00716
	(0.00257)	(0.00312)	(0.0144)	(0.0224)
Firm x Industry FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Firm-level controls	YES	YES	YES	YES
Observations	23,564	23,106	23,106	23,106
R-squared	0.979	0.981	0.979	0.981
First-stage F-test	-	-	4.179	4.179
Number of firms	6,070	6,070	6,070	6,070

MICRO MECHANISMS BEHIND DECLINING LABOR SHARES: MARKET POWER, CHANGING PRODUCTION PROCESSES, AND GLOBAL COMPETITION