

# Within-firm and between-firm drivers of wage inequality in CEE

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# Motivation

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- Ongoing research & policy debate on income and wage inequalities
- Growing evidence on the role firms play in determining wage inequalities
  - (Blau and Kahn 2016; Card, Heining and Kline ,2013; Barth, Bryson, Davis & Freeman, 2016)
- Little evidence on recent developments in wage dispersion in CEE countries

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# Research questions

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- Picture of wage dispersion in CEE:
  - How high wage inequalities are?
  - How do they differ across CEE? How do they compare to Western Europe or CEE?
  - How did they evolve since 2000s?
- What is the role of firms?
  - Are wage differentials higher between or within firms?
  - How do these patterns change?
- What are the micro determinants of wage inequalities?

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# Data

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- European Structure of Earnings Survey (ESES), 2002, 2006, 2010 & 2014 repeated cross sectional data
- 9 CEE countries: CZ, BG, EE, HU, LT, LV, PL, RO, SK
- 3,2 – 5,5 mln individual observations per year, 70 – 120 thousand firms per year
- Wages normalized within country/year (average =100)
- Main variables of interest:
  - Ln(hourly gross wage) and its variance
  - Individual (age, education, gender, experience)
  - Job related (type of contract, occupation)
  - Firm (size, NACE sector, collective bargaining coverage, public/private)
  - Co-workers (share of <30, share of 50+, share of tertiary educated, share of females)

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# Methodology: variance decomposition

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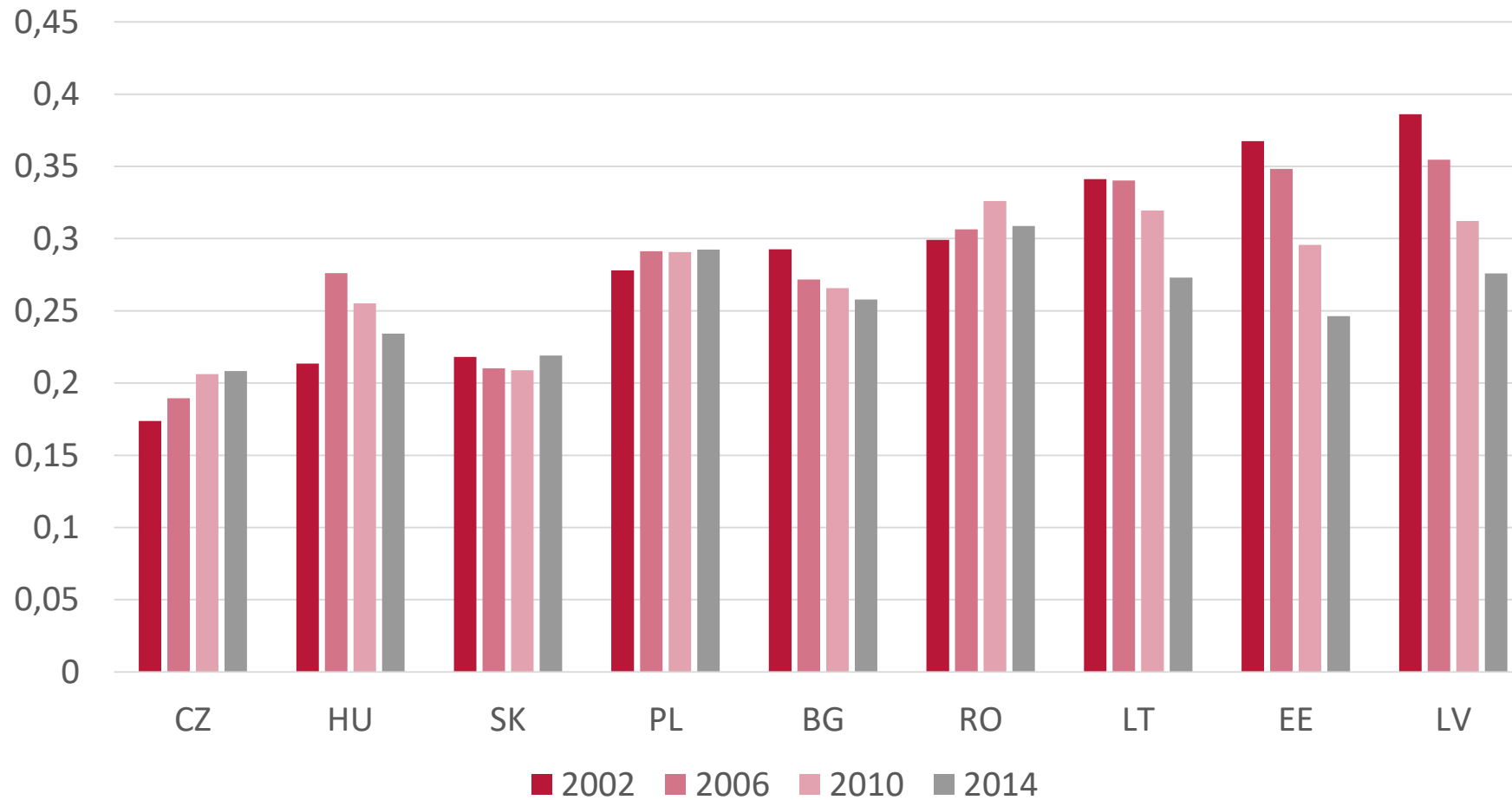


- $\text{Var}(\ln w_{ij}) = \text{Var}(\ln w_{ij} - \underline{\ln w}_i) + \text{Var}(\underline{\ln w}_i)$ 
  - we calculate total variance ( $\text{Var}(\ln w_{ij})$ ) and the between- component  $\text{Var}(\underline{\ln w}_i)$
  - within-variance derived as the difference (Lazear 2009, Barth et al. 2016)

# Variance of wages in CEE, 2002 - 2014 – a convergence?



Variance of wages, CEE, 2002-2014



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# Between firm wage differentials drive the CEE differentials in wage inequality

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## Between firm wage differentials drive the CEE differentials in wage inequality

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Wage variance, 2014





# 2002-2014 changes driven mostly by within-firm changes



var_within	2002	2006	2010	2014
CZ	0.03	0.03	0.05	0.08
HU	0.06	0.09	0.09	0.10
SK	0.05	0.05	0.04	0.06
PL	0.08	0.09	0.09	0.09
BG	0.08	0.13	0.12	0.12
RO	0.12	0.06	0.05	0.04
LT	0.13	0.12	0.13	0.10
EE	0.09	0.09	0.07	0.03
LV	0.18	0.09	0.10	0.06

Within firm inequality increased in low inequality countries,

But decreased in high inequality countries

Thus mainly a convergence in within firm inequality

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# Fewer changes in between-firm wage inequality



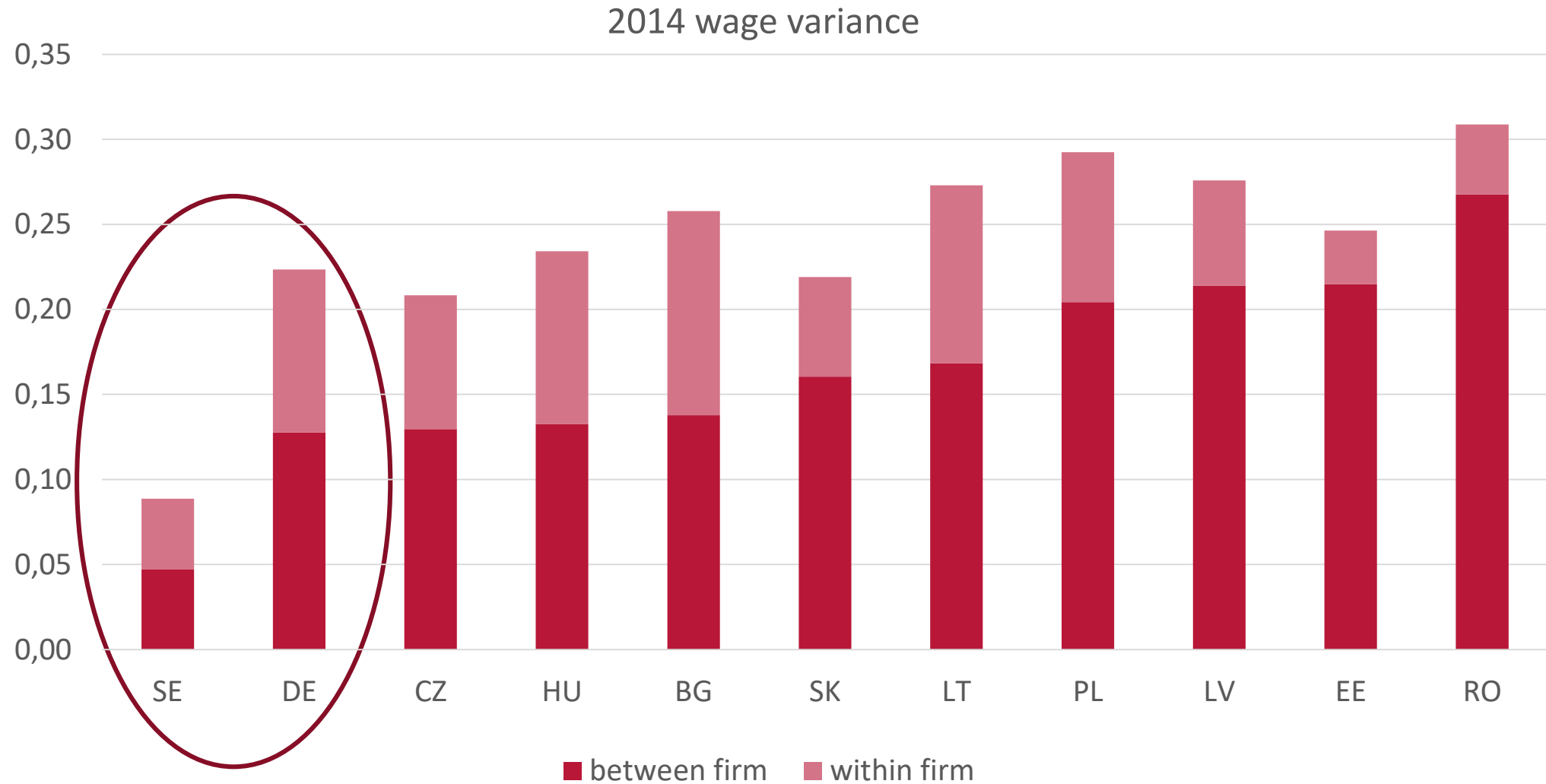
<b>var_between</b>	<b>2002</b>	<b>2006</b>	<b>2010</b>	<b>2014</b>
CZ	0.139	0.162	0.156	0.130
HU	0.149	0.188	0.163	0.132
SK	0.166	0.165	0.164	0.161
PL	0.198	0.206	0.199	0.204
BG	0.213	0.144	0.143	0.138
RO	0.183	0.242	0.274	0.268
LT	0.213	0.219	0.193	0.168
EE	0.282	0.259	0.224	0.215
LV	0.204	0.261	0.209	0.214

# Few changes in between-firm wage inequality

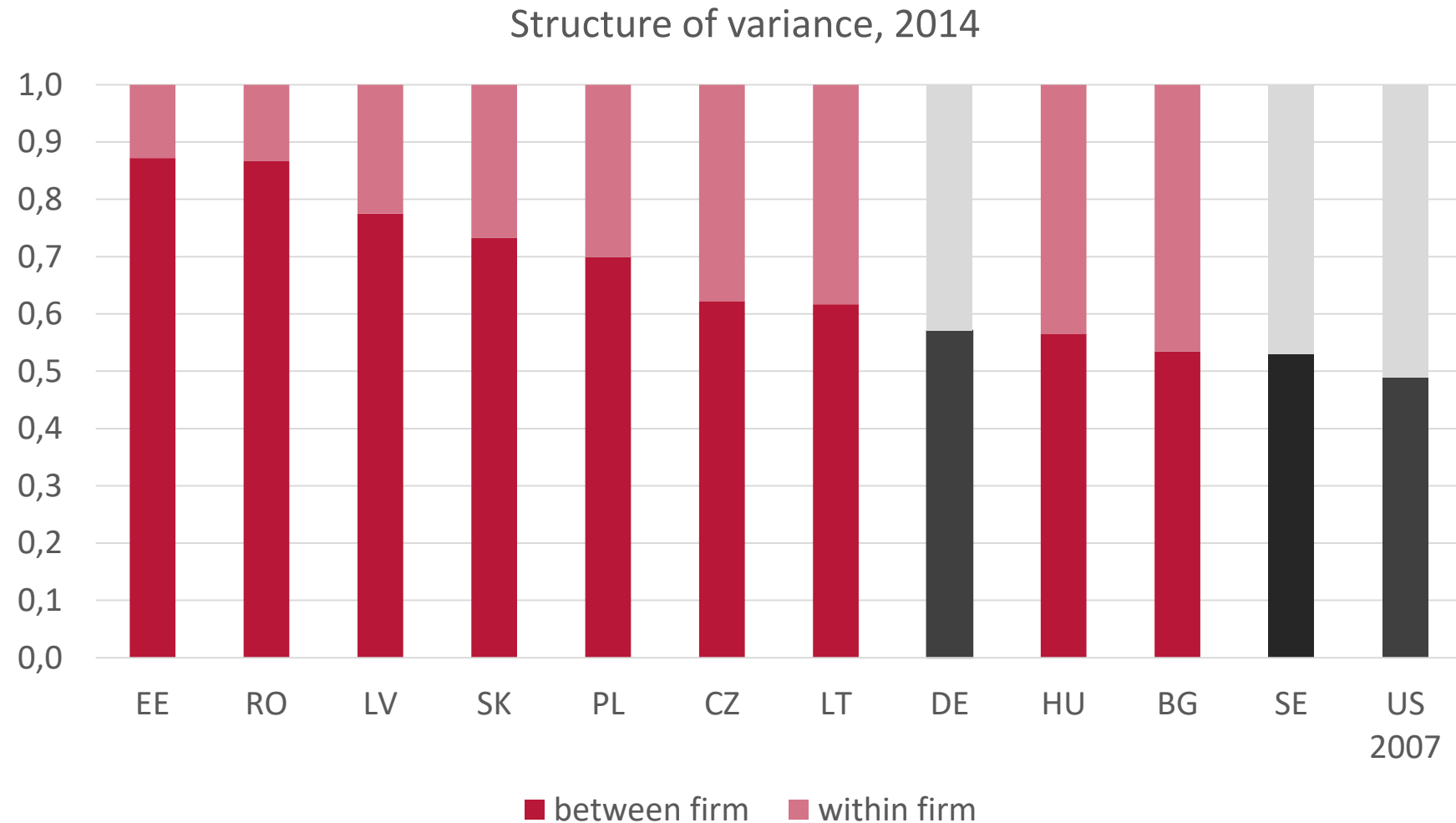


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# CEE's wage inequality higher than DE or SE



# CEEs have high levels and shares of between variance



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# What determines variance of wages?

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RIF regression (Firpo, Fortin, Lemieux 2018)

- Calculate the recentered influence function value for each observation  $y$ :

$$RIF(y; \sigma^2) = \sigma^2 + IF(\sigma^2)$$
$$RIF(y; \sigma^2) = \sigma^2 + (y - \int z * dF_Y(z))^2 - \sigma^2$$

- Run OLS regression of the RIF values on the explanatory variables
- Interpretation: the impact of explanatory variables on variance of log wages

# Micro level analysis of wage variance (RIF reg, 2014)



	<b>CZ</b>	<b>RO</b>
tertiary_edu	0.138***	0.185***
age (55+)	0.090***	0.082***
female	-0.070***	-0.042***
fixed term contract	-0.022***	-0.034***
low skilled occup	-0.130***	-0.135***
industry agreement	-0.034***	-0.069***
firm level agreement	-0.019***	-0.023***
co-workers share of 50+	-0.120***	-0.098***
co-workers: share of tertiary educated	0.115***	0.013**
Public sector	-0.055***	0.011***
Observations	2,176,278	280,194
R-squared	0.133	0.122



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# Decomposing changes in variance of wages (2002-2014, OB) . | :

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	<b>CZ</b>	<b>LV</b>
Difference	0.035***	-0.110***
Endowments	0.011**	0.005*
Coefficients	0.015**	-0.122***
Interaction	0.009	0.007

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Endowments	CZ	LV
ind	0.003	0.018***
job	0.004*	0.017***
firm	0.013***	-0.024***
co-workers	-0.008***	-0.006*

Coefficients	CZ	LV
ind	0.041***	-0.019
job	-0.031***	0.029**
firm	0.020*	-0.059**
co-workers	-0.064***	0.012
Constant	0.048*	-0.085**

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# Conclusions & further work

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- Convergence in the level of wage inequality among CEEs 2002 – 2014
- Wage inequality in CEE driven by between– firm variance, its level have not changed over time in majority of countries
- Micro level: tertiary education contributes to higher levels of wage inequality, collective bargaining and employment with ,weak bargaining power’ powrkers contribute to lower wage inequality
- Determinants of changes over time: firm and coworkers’ characteristics an important contributor of the observed changes in wage inequality

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# Conclusions & further work

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- Analysis of sub periods
- institutional and sectoral explanations, in particular of the between firm variance?
- Robustness checks: Gini coefficient

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