Urban Wage Premia, Cost of Living and Collective Bargaining

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Introduction

- I benefit from the previous presentation, no details about:

✓ Italian bargaining system

✓ The computation of the local CPI

✓ The Theoretical Framework

✓ We make use of a similar CPI

✓ We have unique data for employees and self-employed

The Urban Wage Premium

- Wide literature on the Urban Wage Premium (UWP)
- UWP estimates positive in basically all countries

- Possible explanations:
- **Urbanizations externalities**: lower transport costs, and technological and knowledge spillovers etc. (Marshall, 1890, Glaeser, 1998, Kim, 1987, Ciccone and Hall, 1996).
- **Learning**. Human capital accumulation might be faster in cities, with possible positive spillovers on the unskilled (Moretti, 2004).
- **Sorting**. Best workers and best firms are more likely to be located in urban areas (Combes et al, 2008, Mion e Naticchoni, 2009).
- **Matching**. Better quality of the match in dense areas, due to thicker labour markets.

Goal of the paper

- Main goal: identifying the role played by collective bargaining on the urban wage premium (UWP).

- Collective bargaining tends to make wages homogenous along the space dimension
- Cost of living highly heterogeneous in the space dimension, between urban and rural areas

$\longrightarrow$ to address the impact of collective bargaining on the UWP it is crucial to derive measures of local cost of living

Hence, two additional pillars in the paper: Collective Bargaining and local cost of living

Why is Italy a perfect case study

- Collective Bargaining is a two-tier Multi-Employer system.

- Local prices are very heterogeneous.
- This is particularly true for housing prices that represents the main driver of local consumer price index (CPI).
- Also, papers on **productivity** shows that agglomeration effects are substantial (Cingano and Schivardi, 2004; Lamorgese and Petrella, 2016).

- Additional reason for considering Italy: Excellent data for workers and for housing

ESTIMATION OF A LOCAL PRICE INDEX, LOCAL CPI

Estimation of a local price index

- **Housing is one of the main driver of the variation in local cost of living**: housing costs incorporate economic and non economic factors that make individuals willing to pay more (less) for a given location.

- **Data from the Osservatorio Mercato Immobiliare (OMI)** provide detailed information on housing prices at the municipality level.

- Main intuition from Moretti (2013): computing **direct** and **indirect** impact of housing on local CPI.
- **Direct**: direct costs of housing
- **Indirect**: the effects of housing on other goods, think about a restaurant or having an haircut

How to compute a local price index

- The Local Price index in city *c* at time *t* as a weighted average of two price indexes: housing *H* (direct and indirect impact) and non housing *NH*:

$$\boldsymbol{CPI_{c,t} = \beta H_{c,t} + (1 - \beta) NH_t}$$

- $\boldsymbol{\beta}$ is the weight of the *housing* (*H*) , both direct and indirect

- To derive a local $\boldsymbol{CPI_{c,t}}$ we need to compute $\boldsymbol{H_{c,t}}$, $\boldsymbol{NH_t}$ *and* $\boldsymbol{\beta}$

How to compute $H_{c,t}$ *and* NH_t

- **The housing price index $H_{c,t}$** is computed using the OMI data on the housing transactions.

Public finance approach: regress the price of housing transaction on characteristics (square meter, number of rooms, cadastral category, being in the city center or in the suburbs, state of the property etc).

Residuals are averaged by province (or LLM) and year: **housing price index depurated by the quality of the properties.**

- **The component non housing price NH_t** : national variation of all goods except housing, using national CPI by goods by Istat (as in Boeri et al 2016). No variations at the local level.

- **Period 2005-2015. Base year: 2005**

Estimate of the real weight of housing ($\boldsymbol{\beta}$)

- Estimate of $\boldsymbol{\beta}$: regress the official ISTAT **provincial** $CPI_{p,t}$ on the provincial housing price index ($HP_{p,t}$), with provincial fixed effects:

$$\boldsymbol{CPI_{p,t} = \beta H_{p,t} + \mu_p + \varepsilon}$$

- **From our estimate: $\boldsymbol{\beta = 0.34}$.**
- Much bigger than the direct impact of housing, estimated by Istat to be equal to 0.09.

- We compute the $\boldsymbol{CPI_{c,t}}$ at the municipality level we introduce $\boldsymbol{\beta}$ in

$$\boldsymbol{CPI_{c,t} = \beta H_{c,t} + (1 - \beta) NH_t}$$

A local CPI index

- By definition, this local CPI index is an approximation of the 'true' CPI in a space dimension.

- One might argue that in cities individual might react to the higher cost of living consuming less or differently (i.e. living in tiny flat for instance). In this case our local CPI might **overestimate** the cost of living in cities.

- On the other hand, Combes, Duranton, Gobillon (2017) ⇛ the elasticity of urban costs increases with city population much more than in proportional (linear) way. In this case our CPI might **underestimate** the real cost of living in cities.

Robustness Checks: Alternative CPI indexes

a) Computing the β using housing rents instead of housing prices (data by Istat at the provincial level): **β increases to 0.5**, and results are even stronger.

b) Using an external official but rougher local CPI, provided by ISTAT to compute absolute poverty thresholds ⇨

c) Important point: the CPI affects the magnitude of our impact, not their qualitative interpretation (under the assumption that CPI index is higher in cities).

Two levels of analysis: LLM and municipality

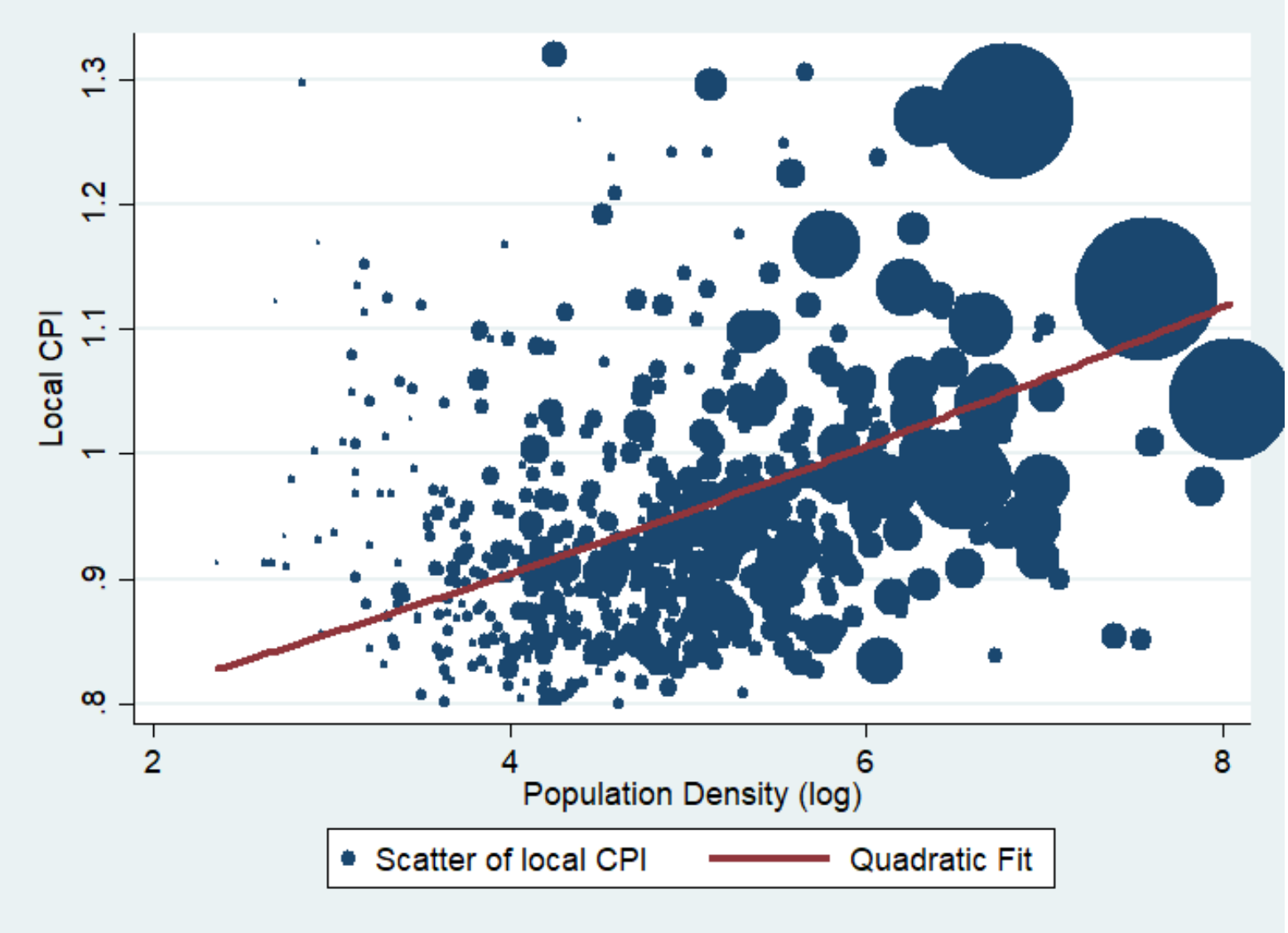
- **Preferred one: Local labour market level : high variability (611 LLM)** and accurate estimate of the local cost of living: the LLM are defined to maximizes the probability that the individual works and lives in the same local unit.

- **Check: Municipality level: very high variability (8,000 municipalities).** Higher probability to imprecisely estimate the local cost of living, which depends also on the municipality where workers live, and on the surrounding municipalities.

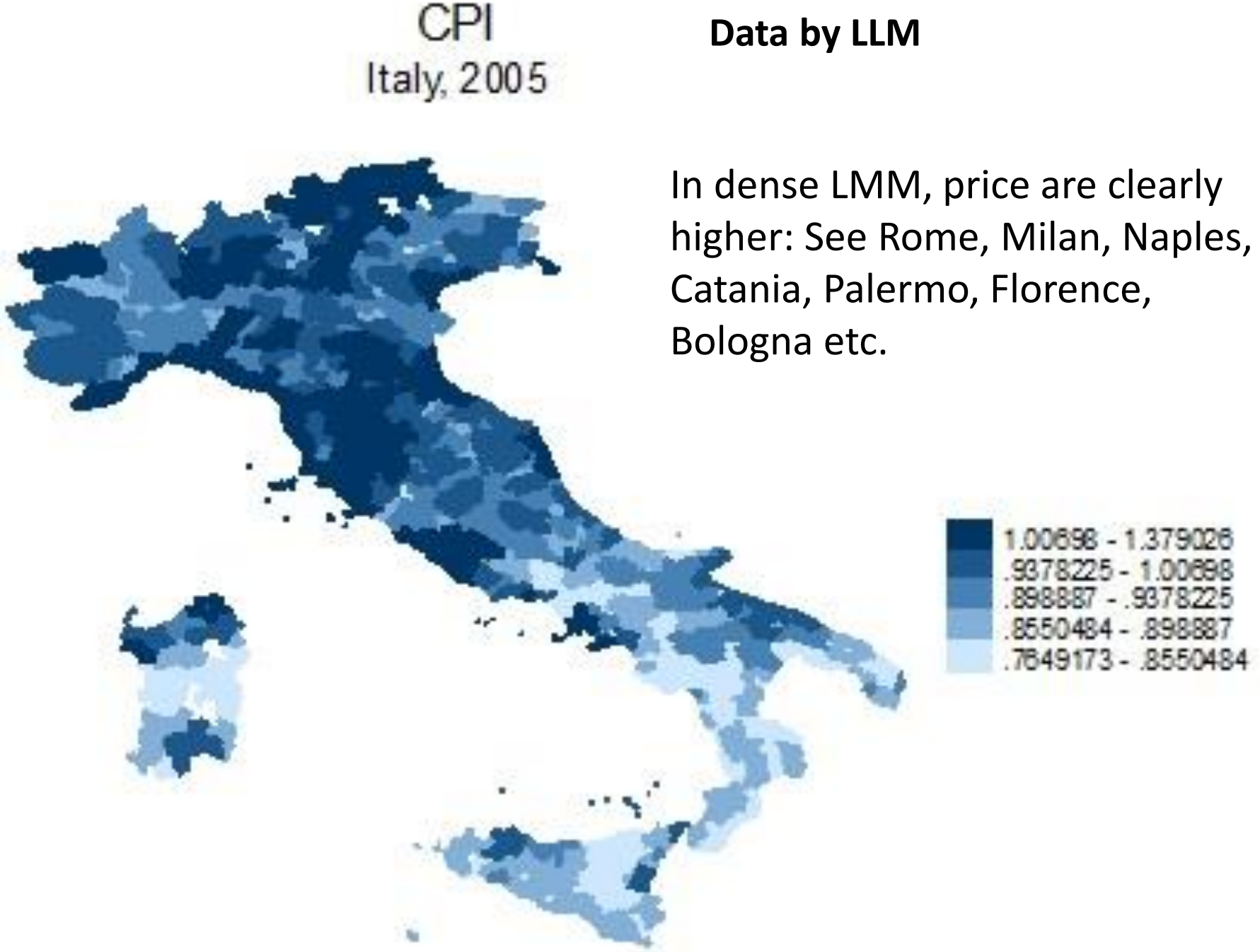
- Robusteness check (see later): Very similar results

LOCAL CPI
DESCRIPTIVE STATISTICS

Clear positive relation between Local CPI and Pop density, by LLM (2005): bubbles are LMM size, in big cities CPI is higher



Data by LLM

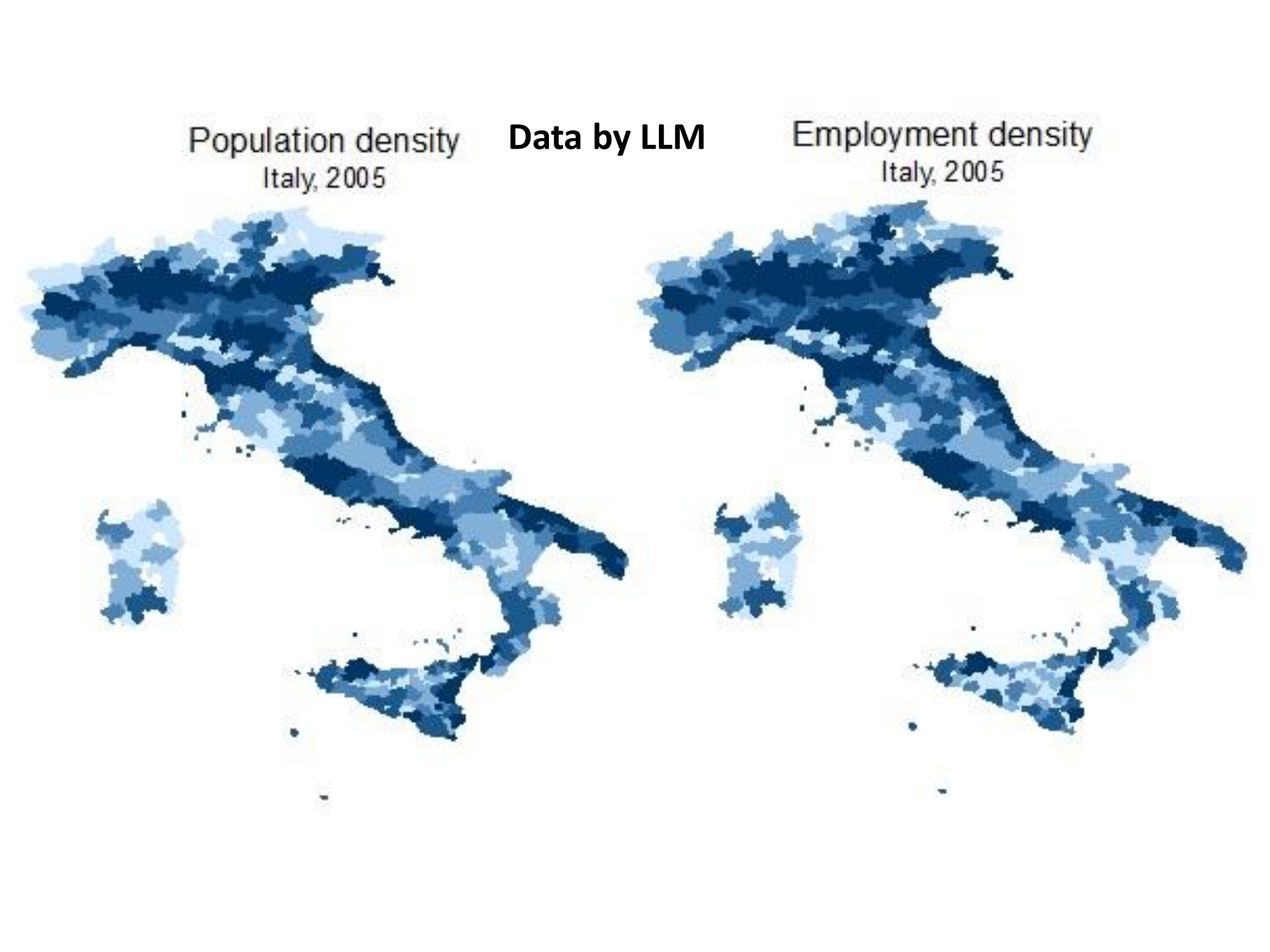


In dense LMM, price are clearly higher: See Rome, Milan, Naples, Catania, Palermo, Florence, Bologna etc.

Agglomeration variable

- Agglomeration measure: **population density (ED),** population by LLM (or municipality) out of surface in km2 (Combes 2000, Combes et al, 2008, 2011, Mion and Naticchioni, 2009, Matano and Naticchioni, 2012).

- As a check we also use *employment density*: similar results


Population density
Italy, 2005
Data by LLM
Employment density
Italy, 2005

Worker data: VisitINPS

- VisitINPS: research program started by Tito Boeri, INPS president from 2015.
- Three different datasets on :

1. Employees, using an employer-employee dataset

- Self-employed, in particular:

2. *'Collaboratori'*, a peculiar type of self-employed, where the worker is still always associated to a firm
3. Standard self-employed ('Casse Professionali'), such as Lawyers, Physicians, Accountants etc.

Employee data: VisitINPS

- Universe of the dependent workers in Italy (male).
- Period: 2005-2015.
- Information of the Municipality where the job is carried out.
- One observation per worker per year (highest earnings).
- Dropping the outliers in the tails (0.5% by year), and workers attached to the labour market for less than two months per year.
- Final sample: around **75 millions of observations**.

Within-Between Variance Decomposition

Variance of nominal wages for employees does not depend much on differences across macroregions, regions or provinces: wage variability is basically very local, within provinces.

Within-Between Variance Decomposition

	Macro Regions (5)	Region (20)	Province (103)
Between	4.4	4.7	6.2
Within	95.6	95.3	93.8
Total	100.0	100.0	100.0

Nominal and Real Wages definition

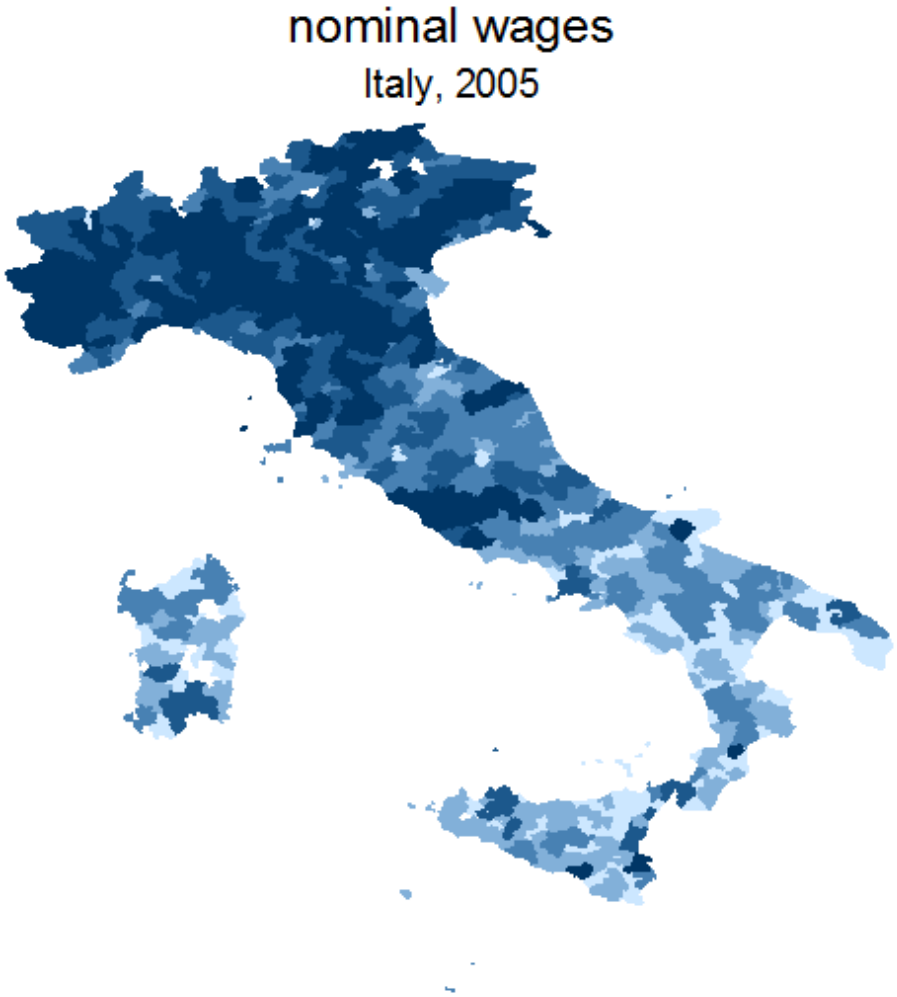
Two weekly wage variables:

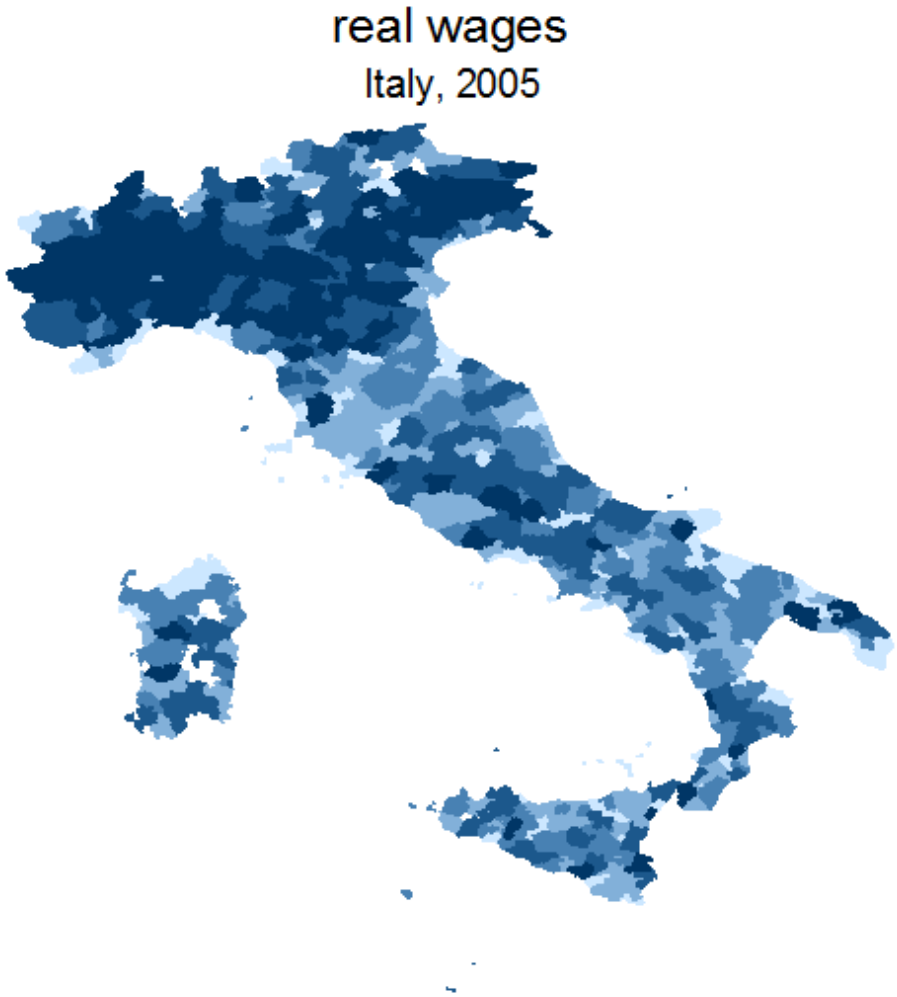
- **Weekly Nominal Wage**;
- **Weekly Spatial Real Wage**: deflated by using the local CPI.

Nominal and Real weekly wages for employee. Year 2005.

quantiles	Nominal Wages	Real Wages
1	401	446
2	428	459
3	444	458
4	472	465
5	511	443

- Clear evidence. Real wages are more compressed.





- Real wages are much lower in cities like Rome, Naples, Milan etc.
- And real wages are greater in the South, consistently with Boeri et al (2017).

THE ECONOMETRIC PART

Econometric specification

- The main specification is:

$$ln(W_{i(c),t}) = \alpha + \rho * ln(PopDen_{i,t}) + \beta * X + \delta_r + \delta_t + u_i + \varepsilon_{i,t}$$

- ρ **: estimate of the UWP.** It is an elasticity: variables are in log.
- Matrix X : individual controls (age, occupation, part time, fixed term); firm controls (size).
- To control for the **centralized national bargaining** we include (250) dummies for all national contracts (roughly industries)
- Year and Regional dummies;
- Standard errors clustered at the LLM level.
- Dropping CPI outliers at the SLL level: 0.5% in the two tails (to exclude locations like *Portofino, Cortina D'Ampezzo, Capri*, or *L'Aquila* after the earthquake in 2009).

UWP Estimates : Nominal Wages

VARIABLES	(1) OLS	(2) + worker charact.	(3) + firm charact.
log pop dens	0.046***	0.006***	0.002
	(0.017)	(0.002)	(0.002)
part time		-0.154***	-0.072***
		(0.007)	(0.006)
fixed term		-0.103***	-0.119***
		(0.008)	(0.004)
log firm size			0.023***
			(0.002)
occupational dummies	no	yes	yes
age dummies	no	yes	yes
contract dummies	no	no	yes
province fe	no	yes	yes
year fe	yes	yes	yes
Observations	77,015,891	77,015,891	77,015,891
R-squared	0.041	0.515	0.608

UWP Estimates : Nominal *vs* Real Wages

	nominal wages			real wages		
VARIABLES	(1) OLS	(2) + worker charact.	(3) + firm charact.	(4) OLS	(5) + worker charact.	(6) + firm charact.
log pop dens	0.046***	0.006***	0.002	-0.006	-0.041***	-0.051***
	(0.017)	(0.002)	(0.002)	(0.017)	(0.012)	(0.004)
part time		-0.154***	-0.072***		-0.185***	-0.070***
		(0.007)	(0.006)		(0.010)	(0.006)
fixed term		-0.103***	-0.119***		-0.120***	-0.124***
		(0.008)	(0.004)		(0.008)	(0.004)
log firm size			0.023***			0.022***
			(0.002)			(0.002)
occupational dummies	no	yes	yes	no	yes	yes
age dummies	no	yes	yes	no	yes	yes
contract dummies	no	no	yes	no	no	yes
province fe	no	yes	yes	no	yes	yes
year fe	yes	yes	yes	yes	yes	yes
Observations	77,015,891	77,015,891	77,015,891	77,015,891	77,015,891	77,015,891
R-squared	0.041	0.515	0.608	0.005	0.444	0.591

Standard errors clustered at the LLM level. *** p<0.01, ** p<0.05, * p<0.1

- In real terms, the UWP becomes negative and substantial!

Unobserved Heterogeneity

- What's the role of sorting of workers and firms?

- To investigate this issue we make use of:

- Individual fixed effects estimate, to evaluate whether the elasticities are affected by sorting of workers (Mion & Naticchioni, 2009; Combes, Duranton, Gobillon, 2008).

- AKM (Abowd, Kramarz, Margolis, 1999) estimates, to control for individual and firm fixed effects. Important recent papers:

- Card et al (2013): firm wage policies have contributed to the increase in inequality in Germany
- Dauth et al, (2016): sorting of firms, and the related assortative matching, explain a substantial part of spatial inequalities

Unobserved Heterogeneity: estimates

	nominal wages			real wages		
VARIABLES	FULL OLS	FE	AKM	FULL OLS	FE	AKM
log pop dens	0.002	-0.000	0.002*	-0.051***	-0.056***	-0.054***
	(0.002)	(0.001)	-0.001	(0.004)	(0.004)	(0.004)
control variables	yes	yes	yes	yes	yes	yes
occupational dummies	yes	yes	yes	yes	yes	yes
age dummies	yes	yes	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes	yes	yes
province fe	yes	yes	yes	yes	yes	yes
year fe	yes	yes	yes	yes	yes	yes
worker fe	no	yes	yes	no	yes	yes
firm fe	no	no	yes	no	no	yes
Observations	77,015,891	77,015,891	77,015,891	77,015,891	77,015,891	76,755,407
R-squared	0.608	0.892	0,892	0.591	0.886	0.9131

*** p<0.01, ** p<0.05, * p<0.1. Clustered Standard Errors - LLM level

Endogeneity

- The estimate of could be biased.
- For example, reverse causality: a productivity shock in a LLM would increase wages attracting more workers.

- Standard solution in a reduced form approach: instrumental variables ⟶ Instruments have to be uncorrelated to current productivity shocks, and correlated with employment density.

- Instruments: lagged values of LLM population, in 1871, almost 150 years ago.
- Similar findings when using IV

Unobserved Heterogeneity and IV: results

	Nominal		**Real**	
VARIABLES	FE	IV-FE	FE	AKM
log pop dens	-0.000	0.000	-0.056***	-0.102***
	(0.001)	(0.002)	(0.004)	(0.011)
control variables	yes	yes	yes	yes
occupational dummies	yes	yes	yes	yes
age dummies	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes
province fe	yes	yes	yes	yes
year fe	yes	yes	yes	yes
worker fe	yes	yes	yes	yes
firm fe	no	yes	no	yes
Observations	77,015,891	77,015,891	77,015,891	76,755,407
R-squared	0.892	0,892	0.886	0.9131

*** p<0.01, ** p<0.05, * p<0.1. Clustered Standard Errors - LLM level

Interpretation

- **Workers are penalized in terms of real wage when living in big cities.**
- Winners in this framework:

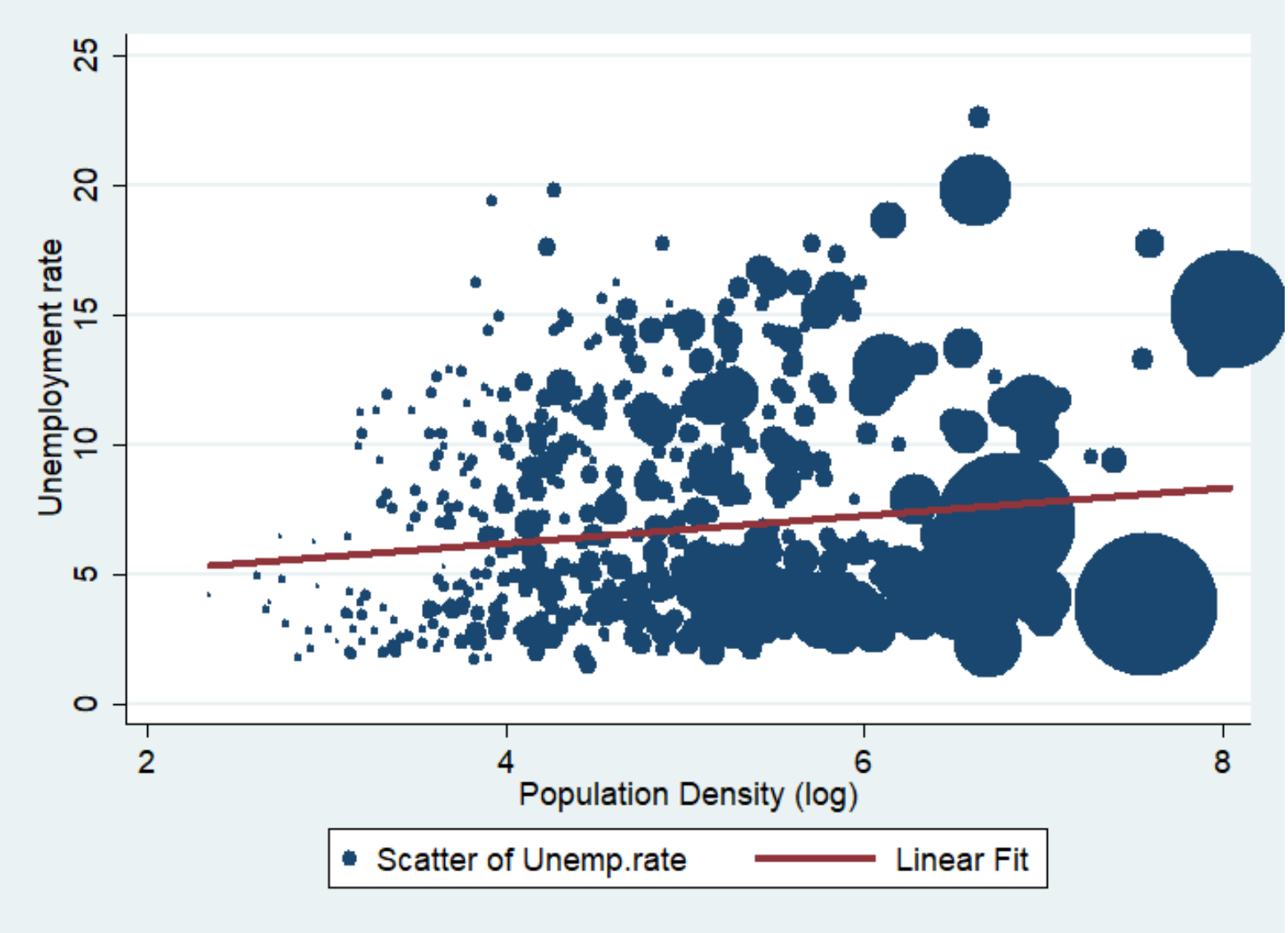
- House-owners in high productivity areas
- Employed in low productivity areas

- According to Boeri et al (2017), **lower real wages in cities should be balanced by lower unemployment rate.**

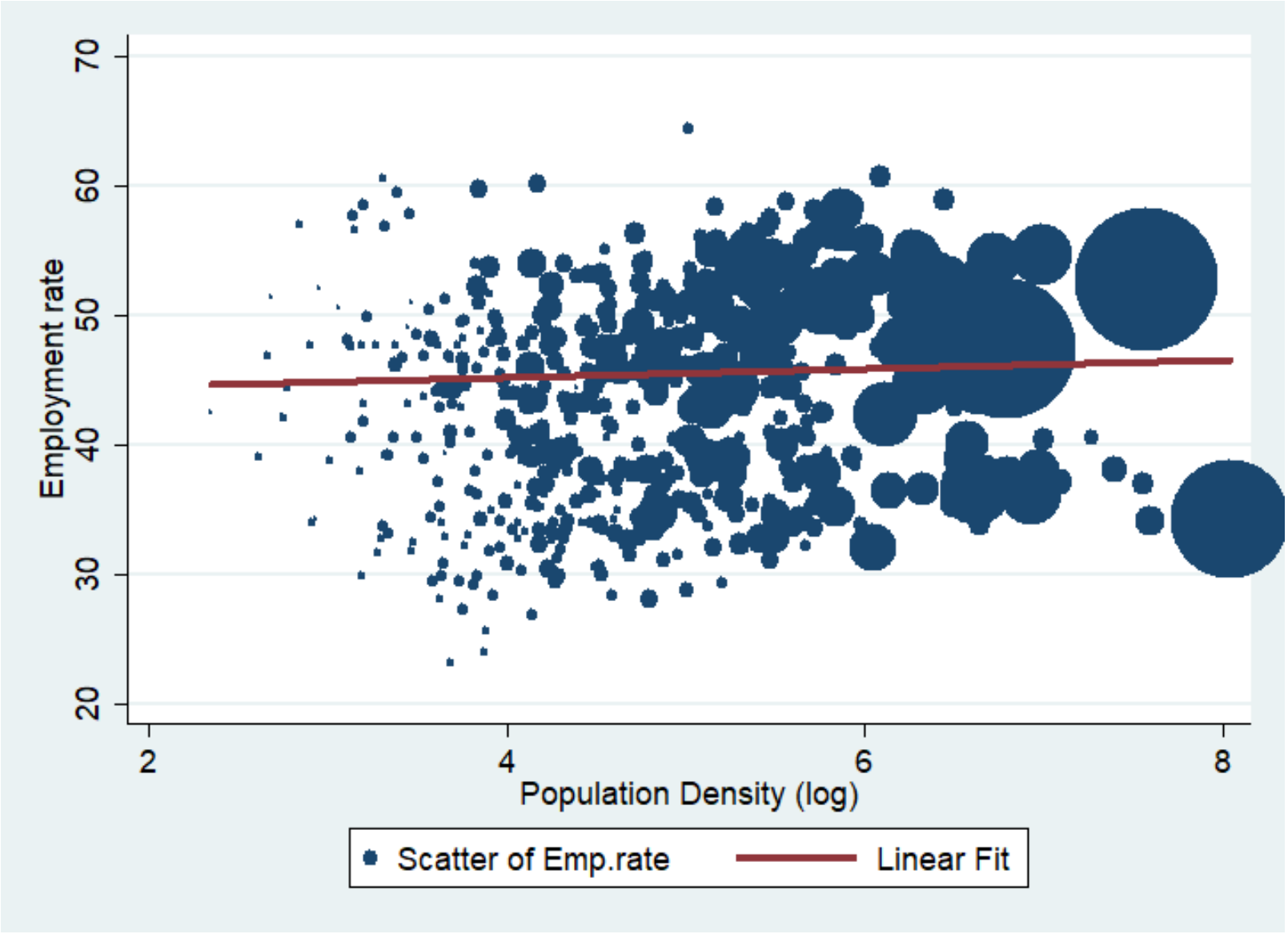
- Is it the case?

- We merge our data with data by Istat on unemployment, employment and inactivity rate by LLM (2006-2015)

Unemployment rate and Population density – by LLM - 2006



Employment rate and Population density – by LLM - 2006



Baseline estimates adding Unemployment Rate: similar results

	nominal wages			real wages		
VARIABLES	(1) OLS	(2) FE	(3) IV-FE	(4) OLS	(5) FE	(6) IV-FE
log pop dens	0.003	0.000	0.001	-0.052***	-0.055***	-0.101***
	(0.002)	(0.001)	(0.002)	(0.004)	(0.004)	(0.011)
part time	-0.072***	0.046***	0.046***	-0.070***	0.046***	0.047***
	(0.006)	(0.003)	(0.003)	(0.006)	(0.003)	(0.003)
fixed term	-0.119***	-0.048***	-0.048***	-0.124***	-0.049***	-0.050***
	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
log firm size	0.023***	0.016***	0.016***	0.022***	0.016***	0.017***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
unemployment rate	-0.001***	-0.002***	-0.002***	0.001	-0.002	-0.001
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
occupational dummies	yes	yes	yes	yes	yes	yes
age dummies	yes	yes	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes	yes	yes
province fe	yes	yes	yes	yes	yes	yes
year fe	yes	yes	yes	yes	yes	yes
worker fe	no	yes	yes	no	yes	yes
Observations	77,015,891	77,015,891	77,015,891	77,015,891	77,015,891	77,015,891
R-squared	0.608	0.892	0.892	0.591	0.886	0.885
K-P rk Wald F statistic			125.423			125.423

Is Collective Bargaining driving our results?

- Urban Economics literature: lower real wages in cities could be due to, at least, three different factors:

- **Amenities and/or quality of public goods**
- **Idiosyncratic preferences for locations**
- **Collective bargaining**

- How is it possible to isolate the role of Centralized Bargaining if any?
- **Our strategy: considering various groups of self-employed,** located in the same areas (hence sharing the same amenities, quality of public goods, and average preferences for locations) but not subject to the national bargaining.

An Analysis on Self-Employment

- A group of self-employed workers, the so called **'*Collaborazioni*',** which are:

- not subordinate employees but anyway associated to a firm;
- usually act as a consultant, as external staff
- temporary
- both skilled and unskilled labour

- These workers are not subject to the Centralized Wage Setting: their earnings are just bargained between employees and employers.

An Analysis on Self-Employment

- The INPS archives include the universe of *collaborazioni (independent contractors)*.
- We exclude:
- *collaborazioni* with a fixed wage, such as the PhD students.
- the (1%) tails in the distribution of earnings and duration.

- The information available are as follows:
- Earnings
- Age and Gender
- Duration of the contracts
- Type of Contract, which refer to the type of *collaborazioni* (general contract, statutory auditor, company administrator, legal representative, etc).

Econometric specification

- The specification is the same as before:

$$ln(W_{i(c),t}) = \alpha + \rho * ln(Ed_{i,t}) + \beta * X + \delta_r + \delta_t + \varepsilon_{i,t}$$

- **Dependent variable: daily wage for Male Workers**
- ***ρ :* estimate of the UWP.**
- Matrix X : individual controls (age, type of contract); firm controls (size, sectoral dummies at 2 digits)
- Year and Regional Fixed effects
- Standard errors clustered at the LLM level.

Employees vs Self-Employed: Nominal Wages

	Employees			Self Employed		
	OLS	**FE**	**AKM**	**OLS**	**FE**	**AKM**
ln(pop. density)	0.002	0.000	0.002*	0.049***	0.011***	0.008***
	(0.002)	(0.003)	(0.001)	(0.009)	(0.003)	-0.004
Observations	77,015,891	77,015,891	76,755,407	5,828,279	5,828,279	5,193,846
R-squared	0.600	0.892	0.917	0.209	0.783	0.828
Year Dummies	YES	YES	YES	YES	YES	YES
ALL Controls	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	YES	NO	YES	YES
Firm FE	NO	NO	YES	NO	NO	YES

*,**,*** stand for 10%,5%,1% statistically significance. Clustered Standard Errors - LLM level.

- In OLS, nominal UWP around **20 times bigger** for self-employed
- **Sorting more at work for self-employed**: when wages can adjust there are more incentives for skilled workers to sort in a city.
- Estimating with AKM does not change much the estimates.

Employees vs Self-Employed: Real Wages

	Employees			Self Employed		
	OLS	**FE**	**AKM**	**OLS**	**FE**	**AKM**
ln(pop. density)	-0.051***	-0.056***	-0.054***	-0.014	-0.055***	-0.057***
	(0.004)	(0.004)	(0.004)	(0.009)	(0.009)	(0.013)
Observations	77,015,891	77,015,891	76,755,407	5,828,279	5,828,279	5158259
R-squared	0.892	0.885	0.9131	0.216	0.785	0.829
Year Dummies	YES	YES	YES	YES	YES	YES
ALL Controls	YES	YES	YES	YES	YES	YES
Individual FE	NO	YES	YES	NO	YES	YES
Firm FE	NO	NO	YES	NO	NO	YES

*,**,*** stand for 10%,5%,1% statistically significance. Clustered Standard Errors - LLM level

- No penalty in full OLS for self-employed;
- Sorting still more at work for self-employed

Groups of *Collaboratori*

	nominal wages			real wages		
	(1)	(2)	(3)	(5)	(6)	(7)
	OLS	FE	AKM	OLS	FE	AKM
PANEL A: Stuatutory auditor, company administrator, legal representative						
log pop dens	0.060***	0.007	0.001	0.003	-0.054***	-0.059***
	(0.011)	(0.006)	(0.005)	(0.011)	(0.009)	(0.008)
Observations	2,729,133	2,622,859	2,599,442	2,729,133	2,622,859	2,599,442
R-squared	0.159	0.781	0.815	0.158	0.781	0.815
PANEL B: External staff of the public administration						
log pop dens	0.031***	0.006	0.003	-0.038***	-0.063***	-0.067***
	(0.007)	(0.005)	(0.005)	(0.011)	(0.007)	(0.010)
Observations	2,410,877	1,971,711	1,941,726	2,410,877	1,971,711	1,941,726
R-squared	0.164	0.797	0.840	0.166	0.798	0.841
PANEL C: External staff of private firms						
log pop dens	0.077***	0.081***	0.135**	0.012	-0.000	0.039
	(0.028)	(0.025)	(0.055)	(0.033)	(0.030)	(0.058)
Observations	188,328	150,069	149,301	188,328	150,069	149,301
R-squared	0.139	0.773	0.786	0.134	0.771	0.785
age fe	yes	yes	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes	yes	yes
industry fe	yes	yes	yes	yes	yes	yes
province fe	yes	yes	yes	yes	yes	yes
worker fe	no	yes	yes	no	yes	yes
firm fe	no	no	yes	no	no	yes

Self selection into employment contract

- Possible challenge: self selection into different contract type (employee vs self-employment) might be driving our results.
- Not an issue if self-selection does not change across the space distribution. And we do not see any systematic reason for it.

- Anyway, to reinforce our results we check whether our results applies for additional groups of self-employed, both high-skilled and medium-skilled.

Analysis on Standard Self-Employment

- INPS archives allow considering standard self-employed (enrolled in *Casse Professionali*).

- Focus on the universe of the following groups:

- Skilled workers (tertiary degree): Business Consultant, Lawyer, Architect, Physicians

- Medium Skilled Workers (upper secondary): Surveyor, Accountant, Journalist

Econometric specification

- The specification is the same as before:

$$\boldsymbol{ln(W_{i(c),t}) = \alpha + \rho * ln(Ed_{i,t}) + \beta * X + \delta_r + \delta_t + \varepsilon_{i,t}}$$

- **Dependent variable: ln(yearly wage)**
- ***ρ :* estimate of the UWP.**
- Matrix X : individual controls (age, province, year fixed effects)
- Yearly Earnings Standard errors clustered at the LLM level.

- For these groups, the location information is time-invariant (hence there is no mobility to estimate Fixed Effect Estimates)

Standard Self-Employed

	Nominal		Real	
	OLS	Full OLS	OLS	Full OLS
ln(pop dens)	0.114***	0.053***	0.058	0.002
	(0.040)	(0.004)	(0.038)	(0.005)
Year FE	SI	SI	SI	SI
Age FE	NO	SI	NO	SI
Province FE	NO	SI	NO	SI
Group SE	NO	SI	NO	SI
Observations	4,154,141	4,154,140	4,154,141	4,154,140
R-squared	0.014	0.267	0.005	0.253

Clustered Standard Errors at the LLM level.

- Even if Full OLS, UWP is around 5%, close to the *Collaboratori*'s one
- In Real Term it is basically zero.

Standard Self-Employed: UWP using Nominal Wage

	HIGH SKILLED /GRADUATED				MEDIUM SKILLED/NO GRADUATED		
	Business Consultant	Lawyer	Physician/ dentist	Architect	Journalist	Surveyor	Accountant
ln(pop dens)	0.099***	0.121***	0.036***	0.030***	0.065***	0.033***	0.047***
	(0.009)	(0.010)	(0.005)	(0.006)	(0.021)	(0.006)	(0.010)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	329,709	813,197	839,317	838,825	102,666	598,215	158,975
R-squared	0.303	0.186	0.080	0.129	0.073	0.204	0.250

Clustered Standard Errors at the LLM level

- Very high UWP for self employed skilled
- Still sizeble UWP for self employed medium-skilled

Standard Self-Employed: UWP using Real Wage

	HIGH SKILLED /GRADUATED				MEDIUM SKILLED/NO GRADUATED		
	Business Consultant	Lawyer	Physician/ dentist	Architect	Journalist	Surveyor	Accountant
ln(pop dens)	0.050***	0.070***	-0.022***	-0.019***	0.013	-0.015**	-0.004
	(0.009)	(0.011)	(0.006)	(0.006)	(0.022)	(0.006)	(0.010)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	329,709	813,197	838,825	839,317	102,666	598,215	158,975
R-squared	0.283	0.167	0.121	0.079	0.060	0.187	0.227

Clustered Standard Errors at the LLM level

- For very high skilled occupations (lawyer and business consultant) UWP still positive e substantial.
- For the other groups, UWP close to zero or slightly negative.

Heterogeneity: Skills and Incentives

- So far we have investigated effects on the mean, using OLS.
- Now we move to wages along the wage distribution, to evaluate heterogeneity in skills $\Longrightarrow$ different incentives in the location choices for different workers, i.e. skilled vs unskilled.

- On the one hand, even with collective bargaining **skilled workers** might derive higher returns in cities: more productive firms could pay higher wages by means of individual/firm bargaining.
- On the other, if unions play a crucial role in the bargaining at the firm level, they might boost wages of **unskilled workers** in cites, where their purchasing power is limited by the higher cost of living.

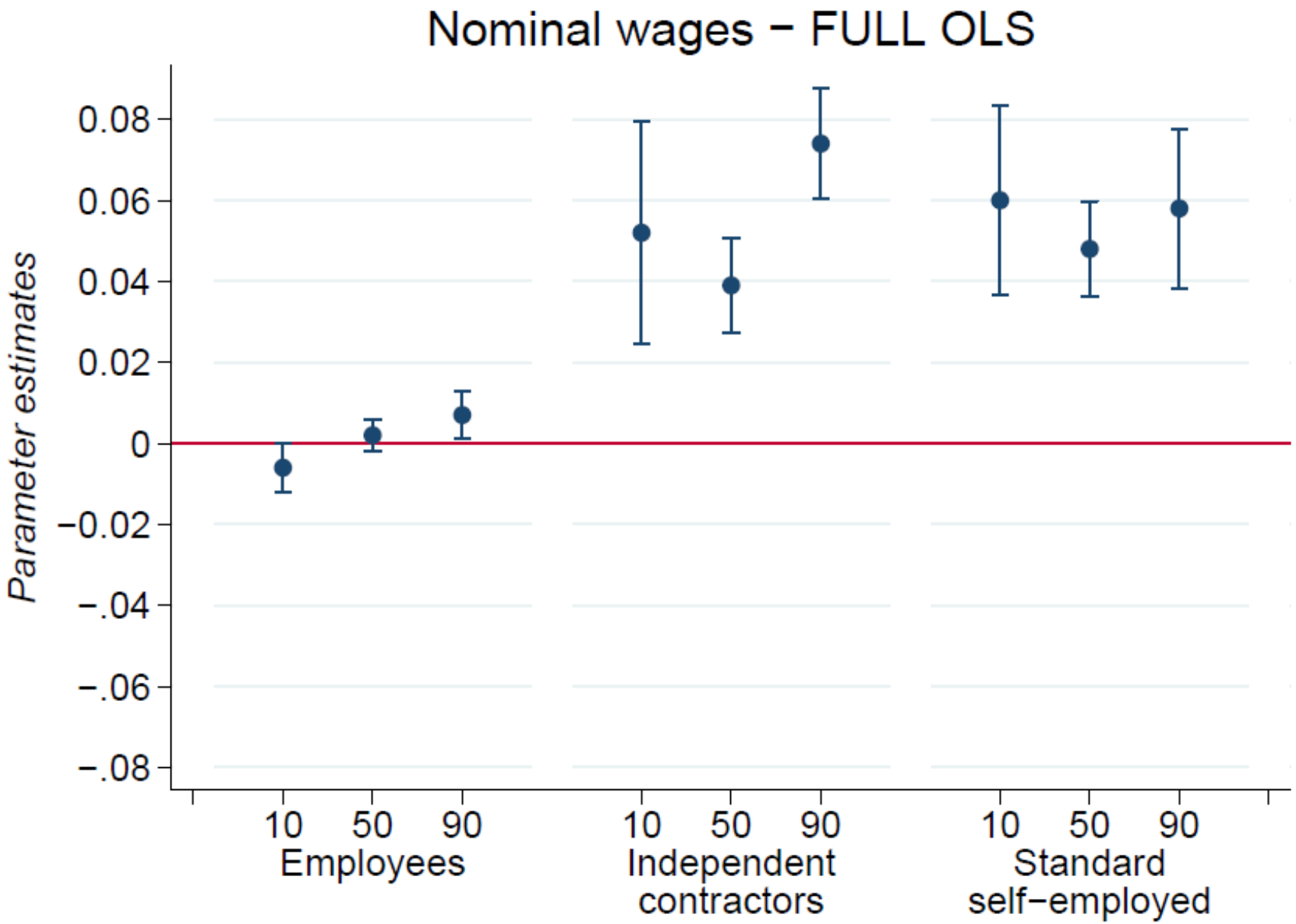
Heterogeneity: Skills and Incentives

- Unconditional Quantile Regressions (Firpo, Fortin, Lemieux, 2009, Econometrica): using the recentered influence function it is possible to evaluate the impact of a covariate of interest on the unconditional percentile of the Y variable.

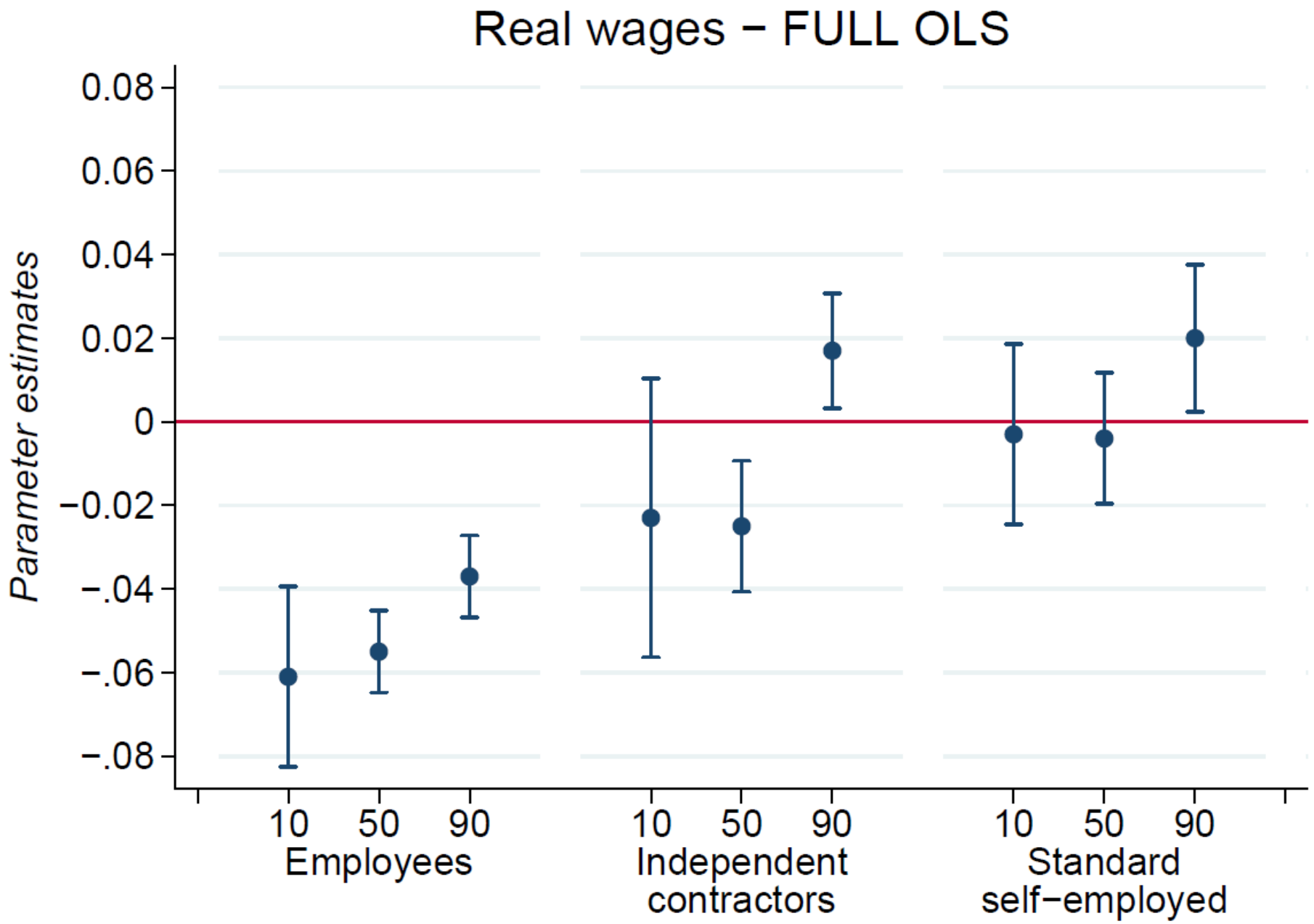
- We consider three percentiles: 10, 50, 90

- This methodology allows also the introduction of individual fixed effects.

Quantiles: groups comparison – Nominal Wage



Quantiles: groups comparison – Real Wages



Heterogeneity: Skills and Incentives

- Differences at the 10 and 90 percentiles are similar (sometimes bigger) than the ones at the mean.

- This represents an indirect evidence that decentralized collective bargaining is not playing an important role in Italy.

- This could be an issue shared by countries using the so-called two-tier multy-employer bargaining system (Boeri, 2015).

Robustness Checks (for the moment for employees, similar results apply for self employed – not showed)

- Using data by the 8,000 municipalities: same results ⇛
- Focusing on prime age workers (25-49): same results ⇛
- Using employment density instead of population density ⇛
- Split by occupation categories (white collar, blu collar, managers). ⇛
  - UWP slightly greater for white collar workers
  - Same results for all categories: very low UWP for nominal wages, negative and substantial UWP for real wages.

A puzzling evidence: why firms do not pay more in cities?

- On the one hand, two-tier multy-employer systems could be associated anyway to **higher overall labour costs**, and this might limit possibilities for the firms to introduce performace-pay schemes (Boeri; 2015).

- On the other hand, two-tier collective bargaining might be considered as a **social norm**, representing a reference benchmark for all firms, even for those that are more productive and that might pay higher wages.

Policy implications

- Towards reforms of the Italian System?
- In which direction?
- Our paper shows that it is not only an issue across macroregions, but also within province between rural and urban areas.
- This means that it cannot be addressed by using some rough rules across macroregions (‘Gabbie Salariali’).

Policy implications

- The discussion should be on how reforming the current system, after 25 years of disappointing performances.

- Related issue on how to move towards the local/firm bargaining: trade off between efficiency and worker protection
- Issue of small firms, how imaging a bargaining in such firms?
- Issue of «Rappresentanza Sindacale»
- Issue of «contratti pirata»

Policy Discussion

- Challenges and opportunities for unions, in order to play a stronger role at the local/firm level :

- Asking for higher wages in high productive and high cost of living areas (or firm)
- Bargaining lower wages in exchange of higher employment rates in area with low productivity/cost of living

Conclusion

- First paper addressing the impact of collective bargaining on UWP, in nominal and (spatial) real terms
- In Real Terms the UWP is negative and substantial, non compensated by lower unemployment rate
- This is not the case when considering Self-Employed, with greater UWP : this suggests collective bargaining is driving the results
- Beyond the conditional mean, results still apply.
- Policy discussion

An Alternative local CPI index

- Official data source of local CPI from ISTAT, used to compute the absolute poverty threshold. This represents the monetary value at current prices of the basket of good and services considered essential for a family.
- The local CPI depends on some geographical variables: Macro area (North, Center, South) and size of the municipality (lower than 50k, from 50 to 250k, more than 250k)

Absolute poverty threshold (Istat) for macroregions and muncipality size in 2005

	North	Centre	South and Islands	North	Centre	South and Islands
Up to 50 thousands	734.74	699.49	552.39	-	-	-
From 50 to 250 thousands	779.97	746.44	588.52	1.06	1.07	1.07
Above 250 thousands	819.13	787.1	609.28	1.11	1.13	1.10

Note. The threshold refers to family with only one member

An Alternative local CPI index: results ⇛

VARIABLES	(1) OLS	(2) FE	(3) IV-FE
log pop dens	-0.026***	-0.028***	-0.033***
	(0.003)	(0.003)	(0.002)
part time	-0.073***	0.046***	0.046***
	(0.006)	(0.003)	(0.003)
fixed term	-0.119***	-0.047***	-0.047***
	(0.004)	(0.003)	(0.003)
log firm size	0.022***	0.016***	0.016***
	(0.002)	(0.001)	(0.001)
occupational dummies	yes	yes	yes
age dummies	yes	yes	yes
contract dummies	yes	yes	yes
province fe	yes	yes	yes
year fe	yes	yes	yes
worker fe	no	yes	yes
Observations	77,015,891	77,015,891	77,015,891
R-squared	0.572	0.882	0.882

Checks: using a municipality CPI ⇛

VARIABLES	(1) OLS	(2) FE	(3) IV-FE
log pop dens	-0.054***	-0.056***	-0.076***
	(0.006)	(0.007)	(0.009)
part time	-0.068***	0.047***	0.048***
	(0.006)	(0.003)	(0.003)
fixed term	-0.131***	-0.051***	-0.051***
	(0.004)	(0.003)	(0.003)
log firm size	0.022***	0.016***	0.017***
	(0.001)	(0.001)	(0.001)
occupational dummies	yes	yes	yes
age dummies	yes	yes	yes
contract dummies	yes	yes	yes
province fe	yes	yes	yes
year fe	yes	yes	yes
worker fe	no	yes	yes
Observations	76,998,804	76,998,421	76,998,421
R-squared	0.582	0.884	0.883
K-P rk Wald F statistic			65.777

Checks: prime age workers (25-49) ⇛

	nominal wages			real wages		
VARIABLES	(1) OLS	(2) FE	(3) IV-FE	(4) OLS	(5) FE	(6) IV-FE
log pop dens	0.002	-0.000	0.000	-0.053***	-0.057***	-0.103***
	(0.002)	(0.001)	(0.002)	(0.004)	(0.004)	(0.011)
part time	-0.080***	0.043***	0.043***	-0.078***	0.043***	0.043***
	(0.007)	(0.003)	(0.003)	(0.007)	(0.003)	(0.003)
fixed term	-0.126***	-0.050***	-0.050***	-0.131***	-0.051***	-0.052***
	(0.005)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
log firm size	0.023***	0.015***	0.015***	0.022***	0.015***	0.015***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
occupational dummies	yes	yes	yes	yes	yes	yes
age dummies	yes	yes	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes	yes	yes
province fe	yes	yes	yes	yes	yes	yes
year fe	yes	yes	yes	yes	yes	yes
worker fe	no	yes	yes	no	yes	yes
Observations	56,696,640	56,254,468	56,254,468	56,696,640	56,254,468	56,254,468
R-squared	0.575	0.888	0.888	0.560	0.883	0.882
K-P rk Wald F statistic			128.187			128.187

Checks: using Employment Density ⇛

	nominal wages			real wages		
VARIABLES	(1) OLS	(2) FE	(3) IV-FE	(4) OLS	(5) FE	(6) IV-FE
log emp dens	0.004***	0.002***	0.000	-0.042***	-0.045***	-0.079***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.008)
part time	-0.072***	0.046***	0.046***	-0.070***	0.046***	0.047***
	(0.006)	(0.003)	(0.003)	(0.006)	(0.003)	(0.003)
fixed term	-0.119***	-0.048***	-0.048***	-0.124***	-0.049***	-0.049***
	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
log firm size	0.023***	0.016***	0.016***	0.023***	0.016***	0.017***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
occupational dummies	yes	yes	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes	yes	yes
province fe	yes	yes	yes	yes	yes	yes
year fe	yes	yes	yes	yes	yes	yes
worker fe	no	yes	yes	no	yes	yes
Observations	77,015,891	77,015,891	77,015,891	77,015,891	77,015,891	77,015,891
R-squared	0.608	0.892	0.892	0.591	0.886	0.886

Checks: Blue Collar Workers

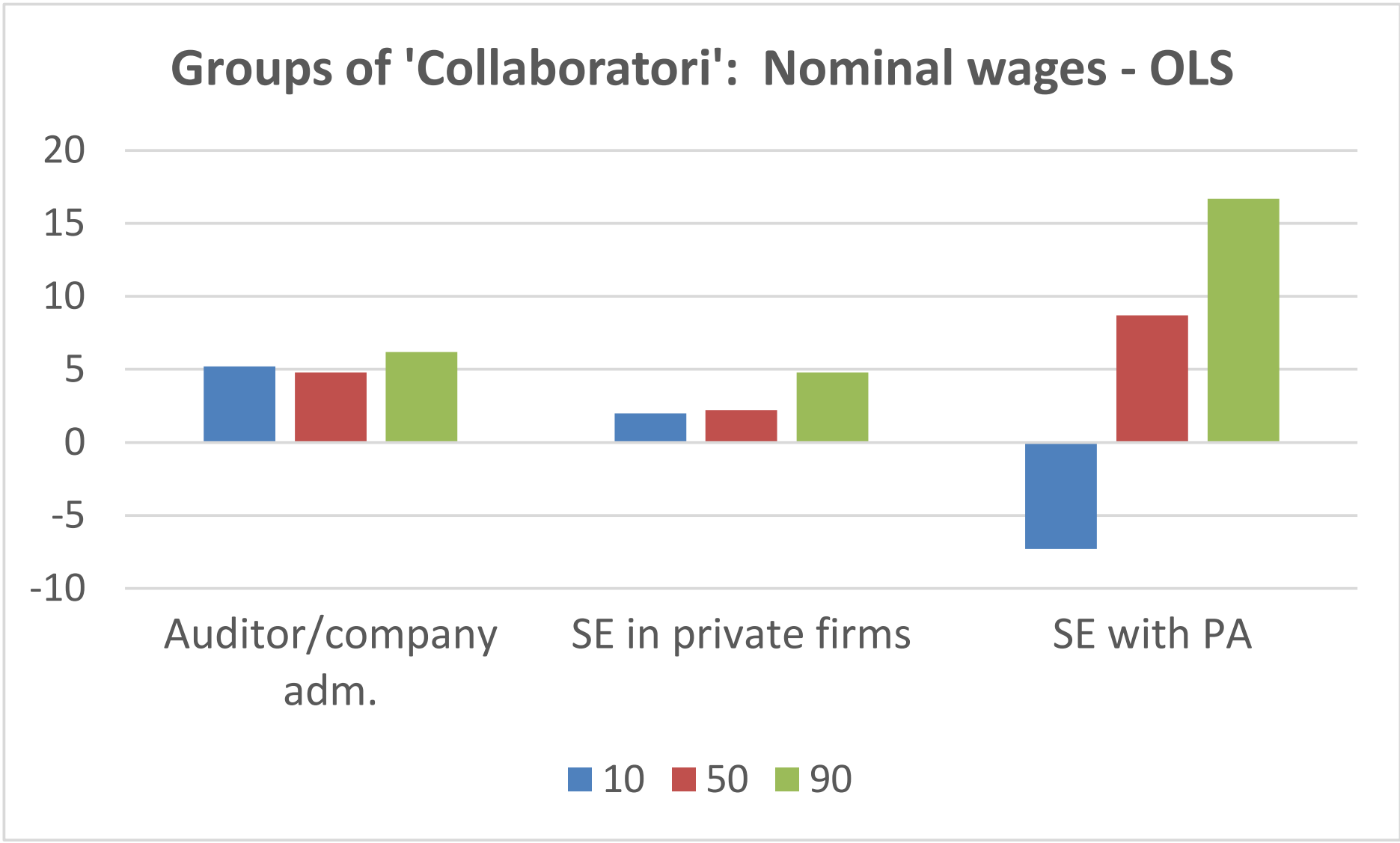
	nominal wages			real wages		
VARIABLES	(1) OLS	(2) FE	(3) IV-FE	(4) OLS	(5) FE	(6) IV-FE
log pop dens	-0.000	-0.002**	-0.003	-0.052***	-0.056***	-0.101***
	(0.002)	(0.001)	(0.002)	(0.004)	(0.004)	(0.011)
part time	-0.048***	0.062***	0.062***	-0.046***	0.062***	0.063***
	(0.004)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)
fixed term	-0.104***	-0.033***	-0.033***	-0.109***	-0.035***	-0.035***
	(0.003)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
log firm size	0.026***	0.015***	0.015***	0.026***	0.015***	0.015***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
age dummies	yes	yes	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes	yes	yes
province fe	yes	yes	yes	yes	yes	yes
year fe	yes	yes	yes	yes	yes	yes
worker fe	no	yes	yes	no	yes	yes
Observations	49,559,314	49,247,306	49,247,306	49,559,314	49,247,306	49,247,306
R-squared	0.358	0.801	0.801	0.378	0.807	0.806
K-P rk Wald F statistic			128.507			128.507

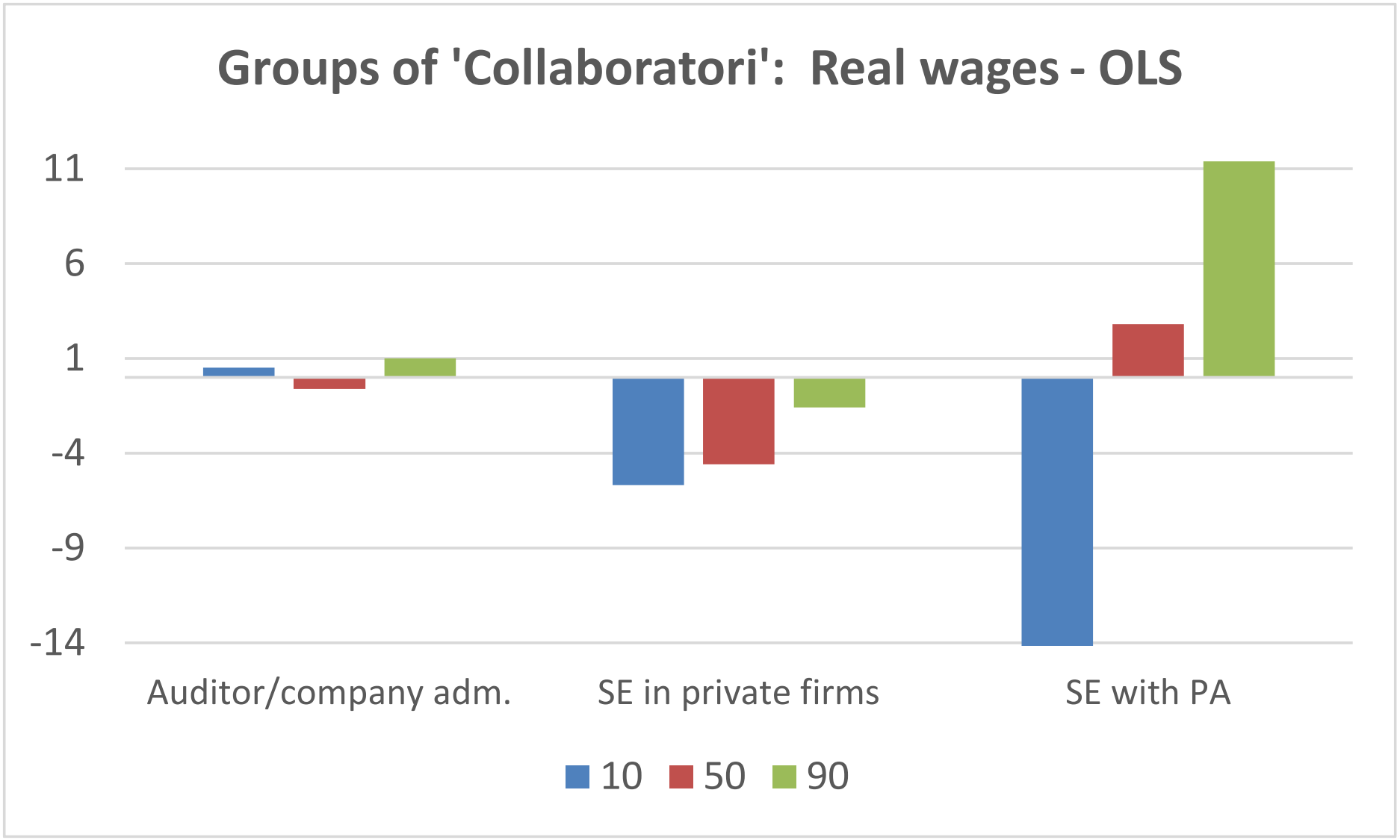
Checks: White Collar Workers

	nominal wages			real wages		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	OLS	FE	IV-FE	OLS	FE	IV-FE
log pop dens	0.014***	0.005***	0.010***	-0.045***	-0.055***	-0.104***
	(0.003)	(0.001)	(0.002)	(0.004)	(0.004)	(0.012)
part time	-0.144***	0.009***	0.009***	-0.144***	0.008***	0.009***
	(0.010)	(0.003)	(0.003)	(0.010)	(0.003)	(0.003)
fixed term	-0.171***	-0.099***	-0.099***	-0.173***	-0.100***	-0.100***
	(0.006)	(0.004)	(0.004)	(0.006)	(0.004)	(0.004)
firm size	0.017***	0.013***	0.013***	0.017***	0.013***	0.013***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
age dummies	yes	yes	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes	yes	yes
province fe	yes	yes	yes	yes	yes	yes
year fe	yes	yes	yes	yes	yes	yes
worker fe	no	yes	yes	no	yes	yes
Observations	20,193,761	19,952,336	19,952,336	20,193,761	19,952,336	19,952,336
R-squared	0.395	0.894	0.894	0.402	0.893	0.892
K-P rk Wald F statistic			110.694			110.694

Checks: Managers and Executives ⇆

	nominal wages			real wages		
VARIABLES	(1) OLS	(2) FE	(3) IV-FE	(4) OLS	(5) FE	(6) IV-FE
log pop dens	0.014***	-0.003***	-0.002	-0.051***	-0.065***	-0.117***
	(0.003)	(0.001)	(0.002)	(0.005)	(0.005)	(0.012)
part time	-0.107***	0.012***	0.012***	-0.106***	0.013***	0.013***
	(0.007)	(0.004)	(0.004)	(0.007)	(0.004)	(0.004)
fixed term	-0.084***	-0.131***	-0.131***	-0.085***	-0.134***	-0.133***
	(0.007)	(0.002)	(0.002)	(0.007)	(0.002)	(0.002)
firm size	0.001	-0.000	-0.000	0.000	0.000	0.000
	(0.002)	(0.000)	(0.000)	(0.002)	(0.000)	(0.001)
age dummies	yes	yes	yes	yes	yes	yes
contract dummies	yes	yes	yes	yes	yes	yes
province fe	yes	yes	yes	yes	yes	yes
year fe	yes	yes	yes	yes	yes	yes
worker fe	no	yes	yes	no	yes	yes
Observations	3,343,657	3,312,484	3,312,484	3,343,657	3,312,484	3,312,484
R-squared	0.279	0.869	0.869	0.318	0.872	0.872
K-P rk Wald F statistic			100.007			100.007


Groups of 'Collaboratori': Nominal wages - OLS
20
15
10
5
0
-5
-10
Auditor/company adm.
SE in private firms
SE with PA
10
50
90


Groups of 'Collaboratori': Real wages - OLS
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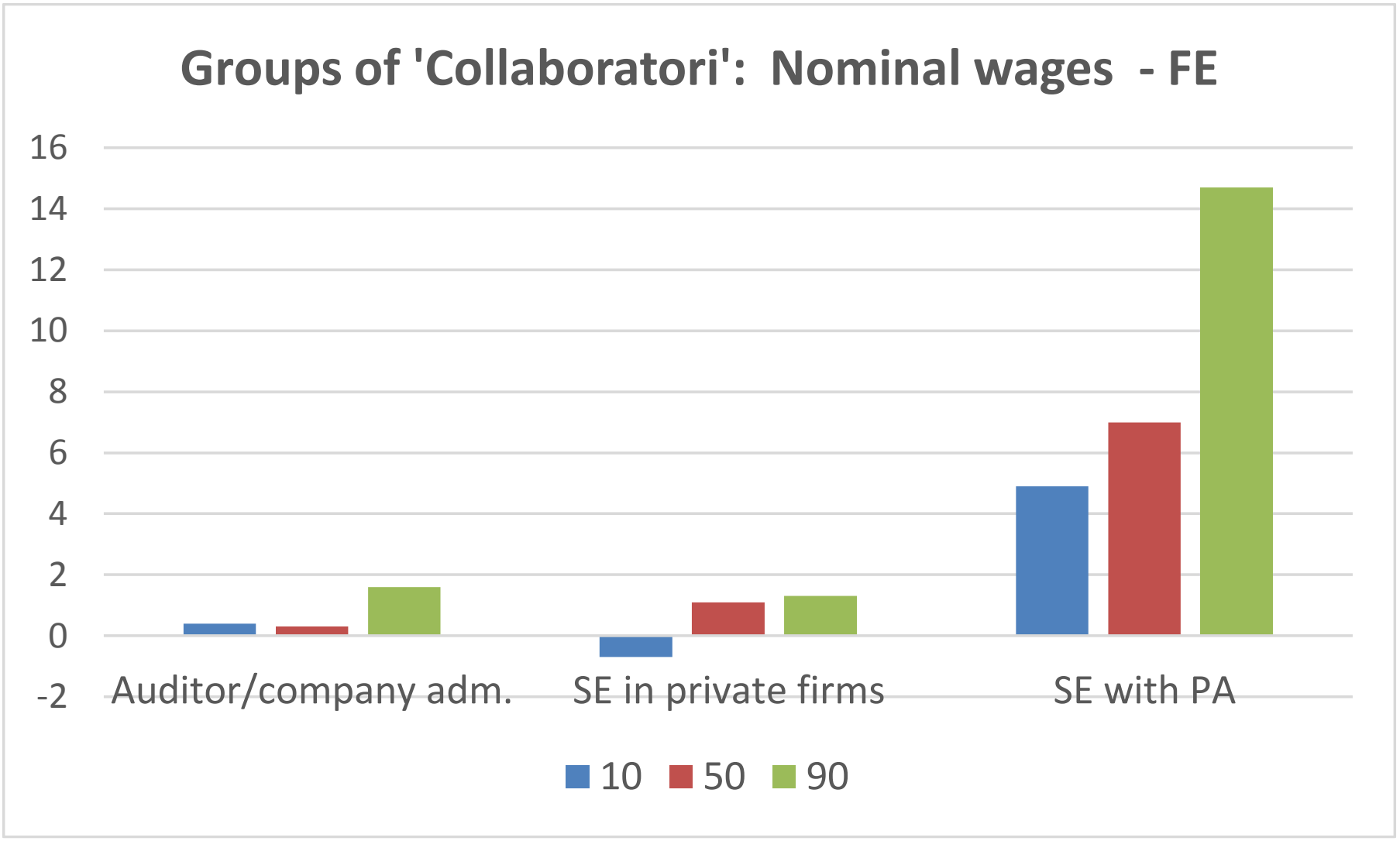
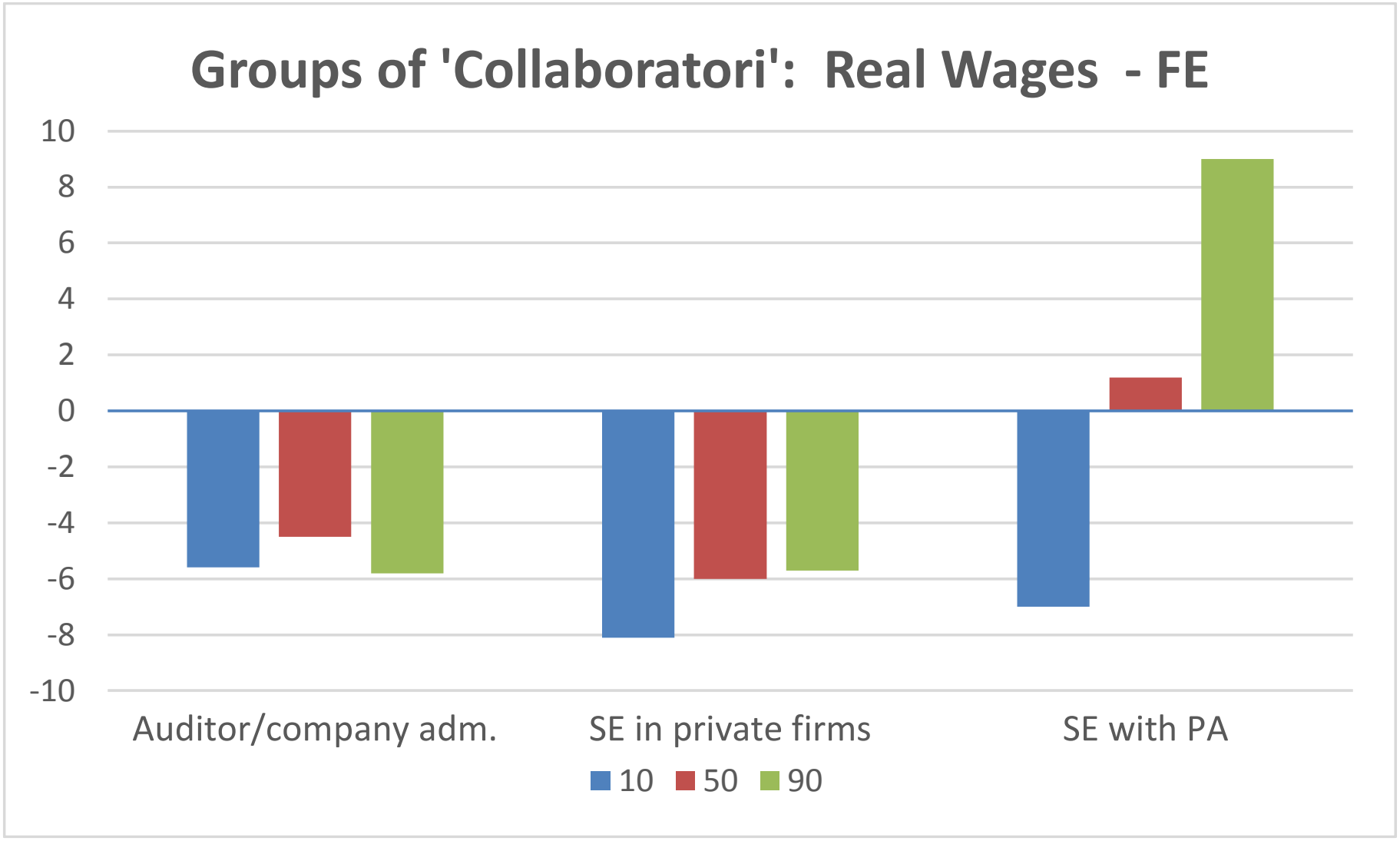
6
1
-4
-9
-14
Auditor/company adm.
SE in private firms
SE with PA
10
50
90


Groups of 'Collaboratori': Nominal wages - FE
16
14
12
10
8
6
4
2
0
-2
Auditor/company adm.
SE in private firms
SE with PA
10
50
90


Groups of 'Collaboratori': Real Wages - FE
10
8
6
4
2
0
-2
-4
-6
-8
-10
Auditor/company adm.
SE in private firms
SE with PA
10
50
90

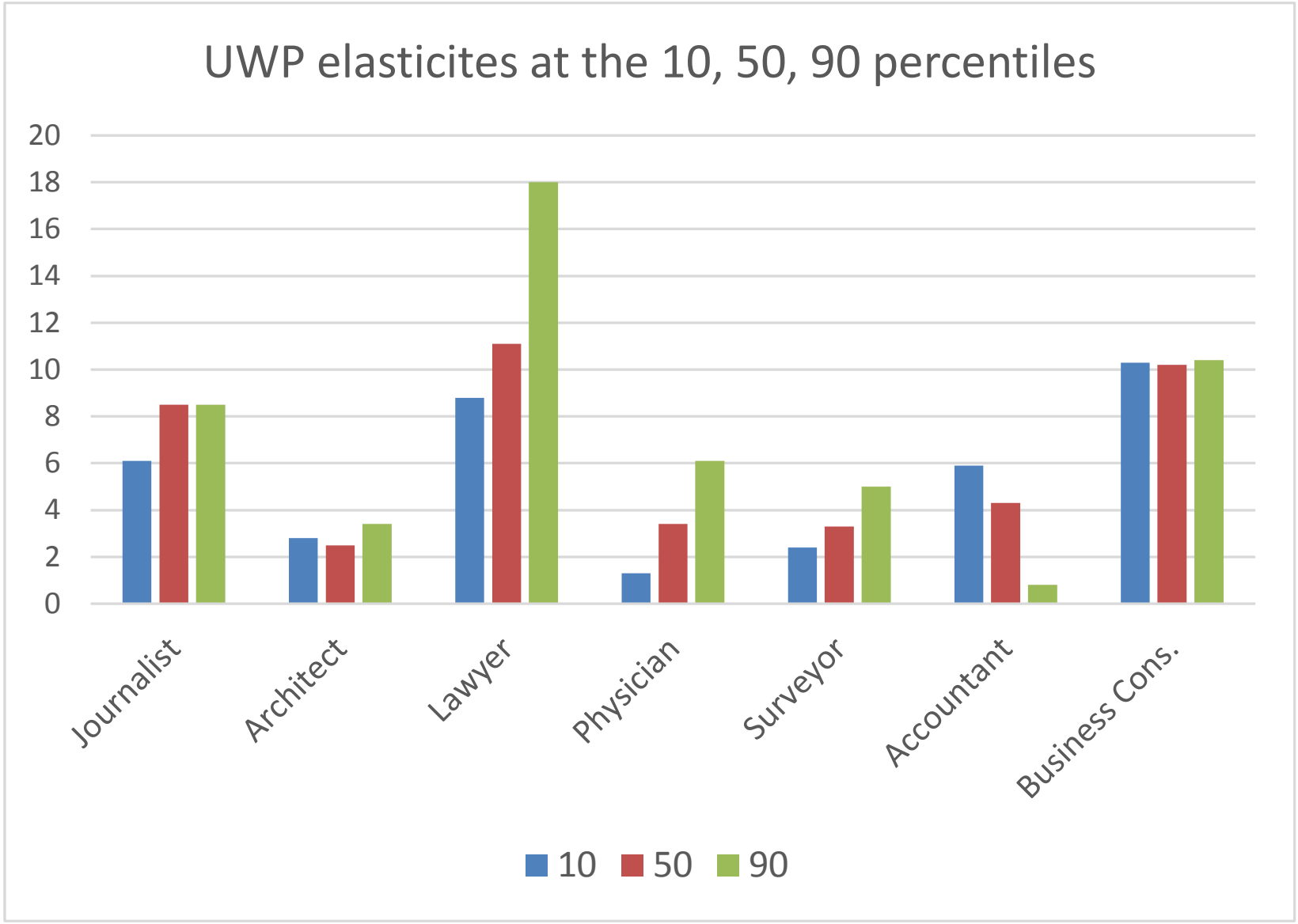
Quantiles: sample of Standard Self-Emp, OLS

	Nominal			Real		
	q10	q50	q90	q10	q50	q90
ln(pop dens)	0.060***	0.048***	0.058***	-0.003	-0.004***	0.020***
	(0.003)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
Age FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-6.117***	5.169***	13.751***	-5.661***	5.542***	13.942***
	(0.142)	(0.041)	(0.056)	(0.140)	(0.042)	(0.056)
Observations	4,153,818	4,153,818	4,153,818	4,153,818	4,153,818	4,153,818
R-squared	0.126	0.170	0.093	0.121	0.159	0.088

Robust standard errors in parentheses

- Positive and homogenous returns for nominal wage.

Quantiles: groups of Standard Self-Emp, OLS



Quantiles: groups of Standard Self-Emp, OLS