Labor Market Power

Berger, Herkenhoff, Mongey (WP, 2019)

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PhD Course: Granularity and Networks

ENSAE-CREST

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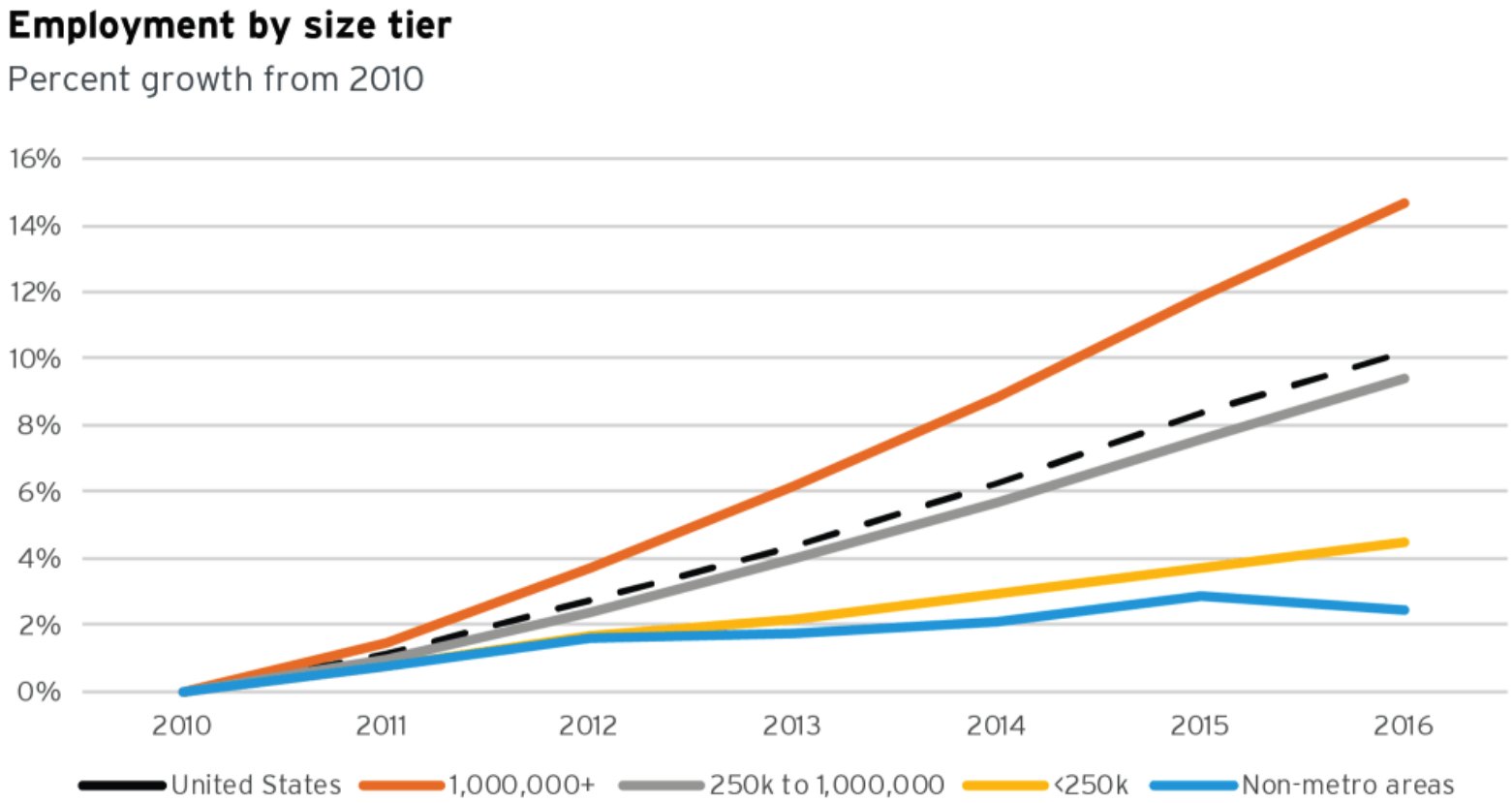
Agglomeration Economies

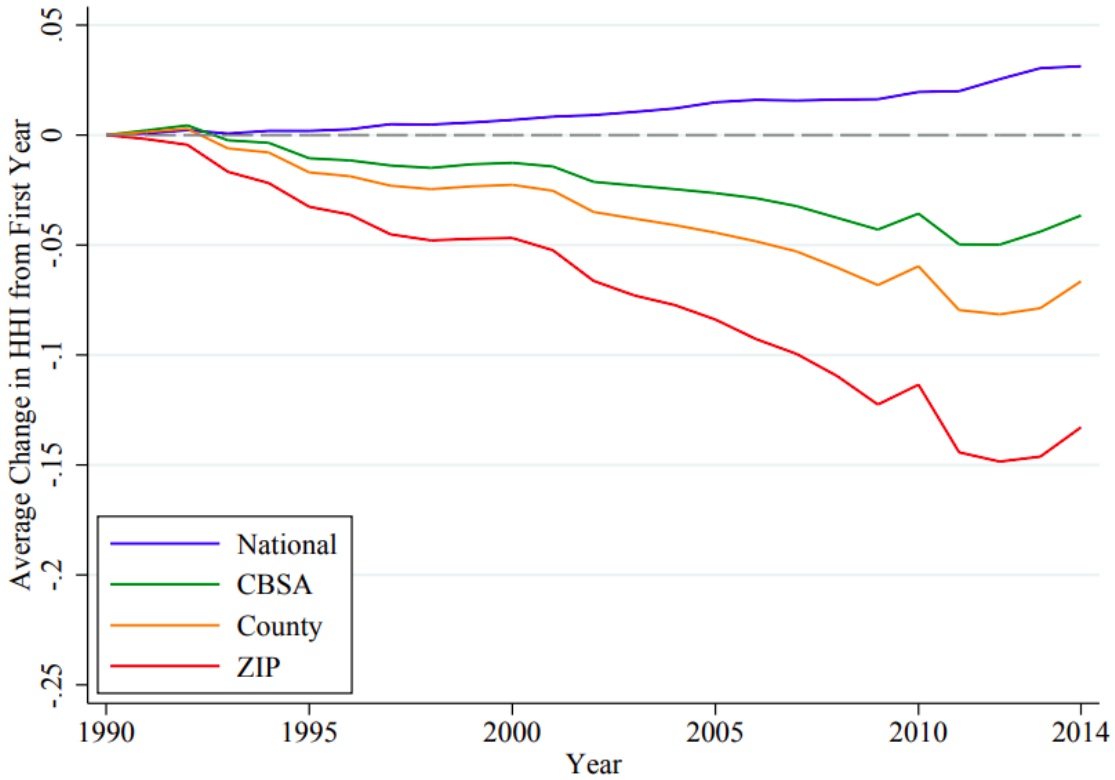


source: Brookings, "The Avenue" (blog), 2018

Maps

Diverging Trends

Figure 1: Diverging economy-wide national and local concentration trends



source: Rossi-Hansberg, Sarte and Trachter, 2018

Granular Component

Challenges

Labor Markets and Firms

- Market Segmentation
- Competition and Markups
- Spatial Divergence

Labor Market Concentration

Local Labor Market:

Properties:

(i) workers' attachment (preferences)

(ii) firms compete strategically

Definition:

- 3-digit NAICS industry
  (like: "*Printing and Related Support Activities*")
- within a Commuting Zone
  (like: Minneapolis or Chicago with their surrounding counties)

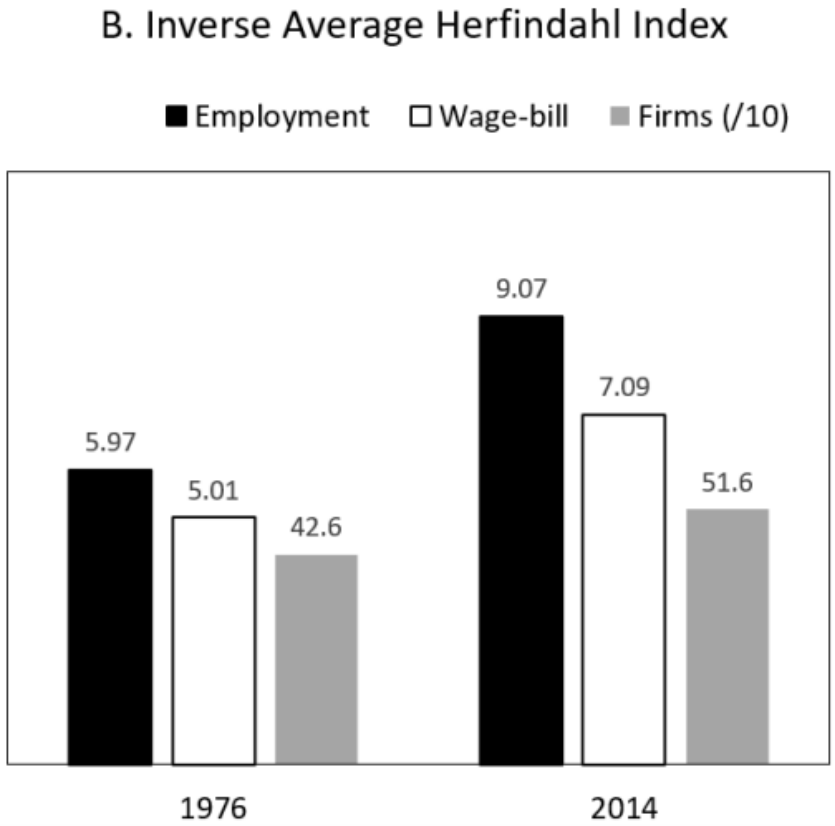
$=>$ obs. 16.000 markets

Labor Market Concentration

Concentration in the US (1976 - 2014)

Wage-bill Herfindahl:

$$HHI_j^{wn} := \sum_{i \in J} (s_{ij}^{wn})^2, \text{ with } s_{ij}^{wn} = \frac{w_{ij} n_{ij}}{\sum_{i \in J} w_{ij} n_{ij}} \text{ (vs. } s_{ij}^{n} = \frac{n_{ij}}{\sum_{i \in J} n_{ij}})$$



Labor Market Concentration

Market-level Average					
		Wage-bill		Employment	
		H	1/H	H	1/H
US(LBD)	1976	0.45	5.01	0.43	5.97
	2014	0.45	7.09	0.42	9.07
FRA(DADS)	2005	0.48	6.65	0.47	7.49
		(0.35)	(13.8)	(0.38)	(16.68)
	2015	0.47	6.81	0.46	7.69
		(0.35)	(16.5)	(0.35)	(19.79)
cor: wage	2015	-0.09*	0.22*	-0.09*	0.24*
cor: emp		-0.12*	0.27*	-0.12*	0.26*
cor: wage/emp		0.12*	-0.06*	0.10*	-0.05*

Purpose of the Model

Segmented Labor Markets Model

Workers can move[1]:

(a) Between Markets (either industries, cities or both, at cost θ)

(b) Within markets across firms (cost η)

$=>$ Frictions. Lower costs implies lower market power.

Oligopsony in each markets with Firms:

(i) Internalizing their upward sloping labor supply curve

(ii) Non-atomistic with Cournot competition (on quantity)

$=>$ Firm's equilibrium wage is a size-dependent markdown and profits

[1] Following Kennan and Walker (2011) approach

Set-up

Environment

Agents:

- Representative Household
- Continuum of firms i, heterogeneous in:
  - localization j from a continuum (industry *time* city)
  - productivity $z_i jt$ (from a distribution $f(z)$, location invariant)

=> Granularity resides in the **finite number of firms** within each labor market (will be the source of Market Power)

=> Other quantities are "continuum"

Model's equations

Production function and Problems of the household

Production function:

$$y_{ijt} = Zz_{ijt}(k_{ijt}^{1-\gamma} n_{ijt}^{\gamma})^{\alpha}, \text{ with } \gamma \in (0,1) \text{ (share) and } \alpha > 0 \text{ (scale)}$$

Representative household:

$$U_0 = \max_{\{n_{ijt}, c_{ijt}, K_{t+1}\}} \sum_{t=0}^{\infty} \beta^t u(C_t - \frac{1}{\varphi^{\frac{1}{\varphi}}} \frac{N_t^{1+\frac{1}{\varphi}}}{1+\frac{1}{\varphi}}), \ \beta \in (0,1), \ \varphi > 0$$

Where the disutility of labor supply is:

$$N_t := [\int_0^1 Njt^{\frac{\theta+1}{\theta}}]^{\frac{\theta}{\theta+1}} \text{ and } N_{jt} := [n_{1jt}^{\frac{\eta+1}{\eta}} + ... + n_{M_j jt}^{\frac{\eta+1}{\eta}}]^{\frac{\eta}{\eta+1}}$$

Model's equations

Firm Side

Inverse labor supply function:

$$w_{ijt} = \varphi^{\frac{1}{\varphi}} \left(\frac{n_{ijt}}{N_{jt}}\right)^{\frac{1}{\eta}} \left(\frac{N_{jt}}{N_t}\right)^{\frac{1}{\theta}} N_t^{\frac{1}{\varphi}}$$

Labor demand problem:

$$\pi_{ijt} = \max_{n_{ijt}} Z \tilde{z}_{ijt} n_{ijt}^{\alpha} - w_{ijt} n_{ijt}$$

foc: $w_{ijt} = \mu_{ijt} MRLP_{ijt}$, with $MRLP := \alpha Z \tilde{z}_{ijt} n_{ijt}^{\alpha-1}$

In the Nash equlibrium, the markdown is determine by the equilibrium elasticity of the firms' labor supply ϵ_{ijt}:

$$\mu_{ijt} = \frac{\epsilon_{ijt}}{\epsilon_{ijt}+1}, \text{ with } \epsilon_{ijt} = \left[\frac{1}{\eta}(1 - s_{ijt}^{wn}) + \frac{1}{\theta} s_{ijt}^{wn}\right]^{-1}$$

Graph

Equilibrium

Properties:

Local level:

- Larger market shares implies smaller labor supply elasticities and (thus) larger mark-downs:

$$\frac{\partial \epsilon_{ij}}{\partial s_{ij}^{wn}} < 0 \text{ and (thus) } \frac{\partial \mu_{ij}}{\partial s_{ij}^{wn}} < 0$$

General equilibrium:

- Allows to determine the labor share as a fonction of θ and η
- A single firm's labor share is proportionate to its markdown
- Provides a closed-form between labor share and concentration (increasing in weighted inverse Hefindahl index)

Equilibrium

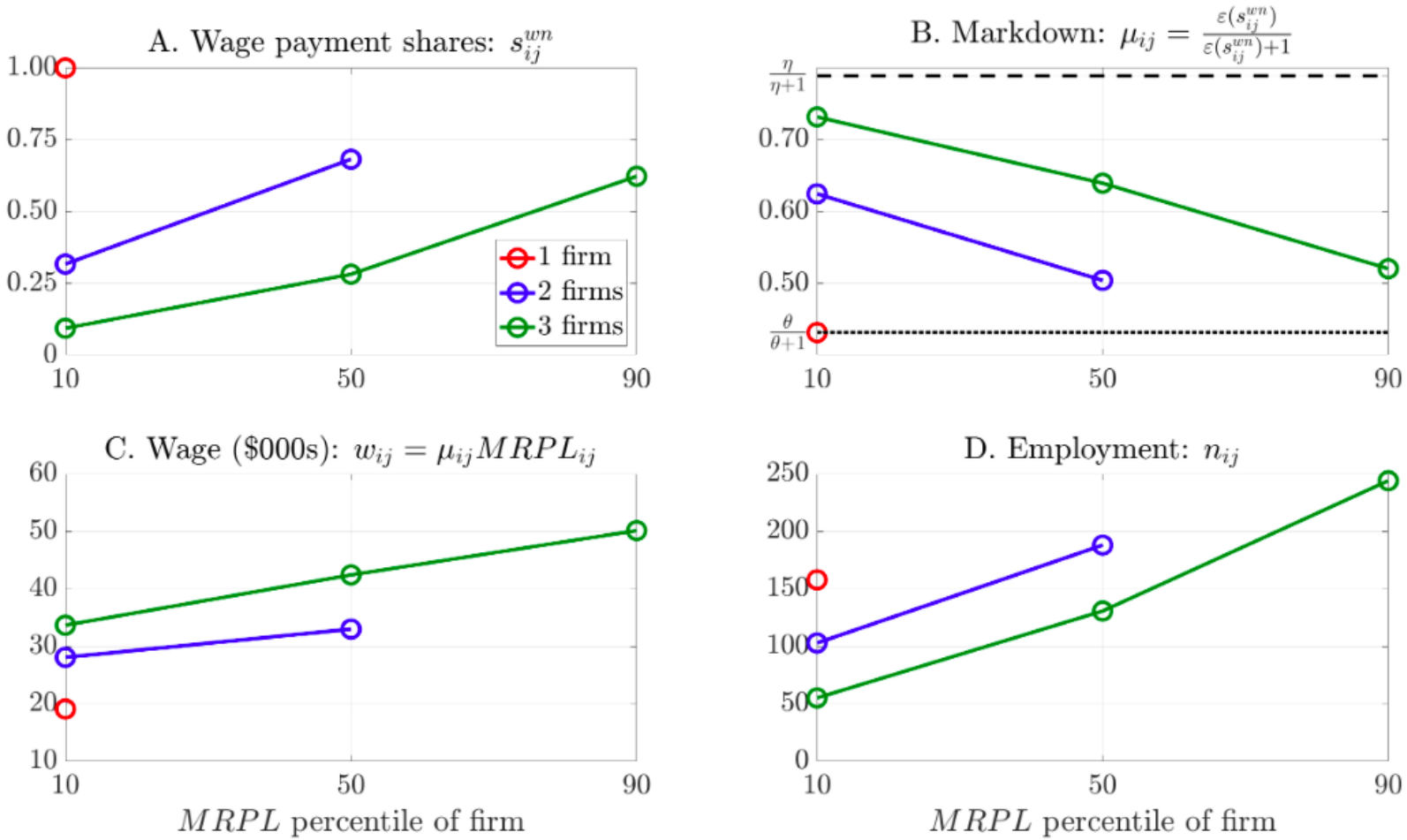


Figure 3: Oligopsonistic equilibrium in three labor markets

Calibration

Two Steps

A. Estimates cross-market (θ) and within-market (η) labor substituability:

$$\epsilon(s^{wn}_{ijkt}) = \frac{\beta^n + \gamma^n s^{wn}_{ikt}}{\beta^w + \gamma^w s^{wn}_{ikt}}$$

with: $\frac{dlog(n_{ijkt})}{d\tau_{s(k)t}} = \beta^n + \gamma^n s^{wn}_{ikt}$ and $\frac{dlog(w_{ijkt})}{d\tau_{s(k)t}} = \beta^w + \gamma^w s^{wn}_{ikt}$

B. Remaining parameters:

- Target relevant moments: (a) average firm employment, (b) average earnings per worker, (c) the labor share, and (d) employment-weighted wage-bill Herfindhal

Calibration

Focus on (my favorite) step: **A.**

Internal Capital Market

- Transaction costs and the Theory of the Firm:
  Coase (1937); Williamson (1967)
- Tools to estimate marginal productivity and factor relocation:
  Giroud and Mueller (2015); Charnoz et al. (2018)

Estimation

- Tax changes: within state between commuting zones
- Regress employment and wages according to tax changes time market share (pass-through) with firm fixed effect
- Discuss short and longer term adjustment (select long one)

Welfare implication

Counter factual

Labor Market Power (two sources)

- Firms internalize upward slopping labor supply
- Non-atomistic and so competing strategically (Cournot)

Competitive equilibrium (counter factual model)

- Firms internalize upward slopping labor supply
- Non-atomistic but *behave as* atomistic **price taker**

=> Estimate the impact of Market Segmentation

Graph

Perspectives

Labor Markets and Firms: what's next?

- System of cities with unemployment (Gaubert, 2018)
- Disentangling occupation from spatial substistuability (frictions) (Traiberman et al., 2017; Schmutz and Sidibé, 2018)
- Enlighten sectoral to functional and local to national concentration (Duranton and Puga, 2005; Rossi-Hansberg et al., 2018)
- Uses counterfactual to estimate how market segmentation matters for macro-study. Compare national and local trends Autor et al., 2017).

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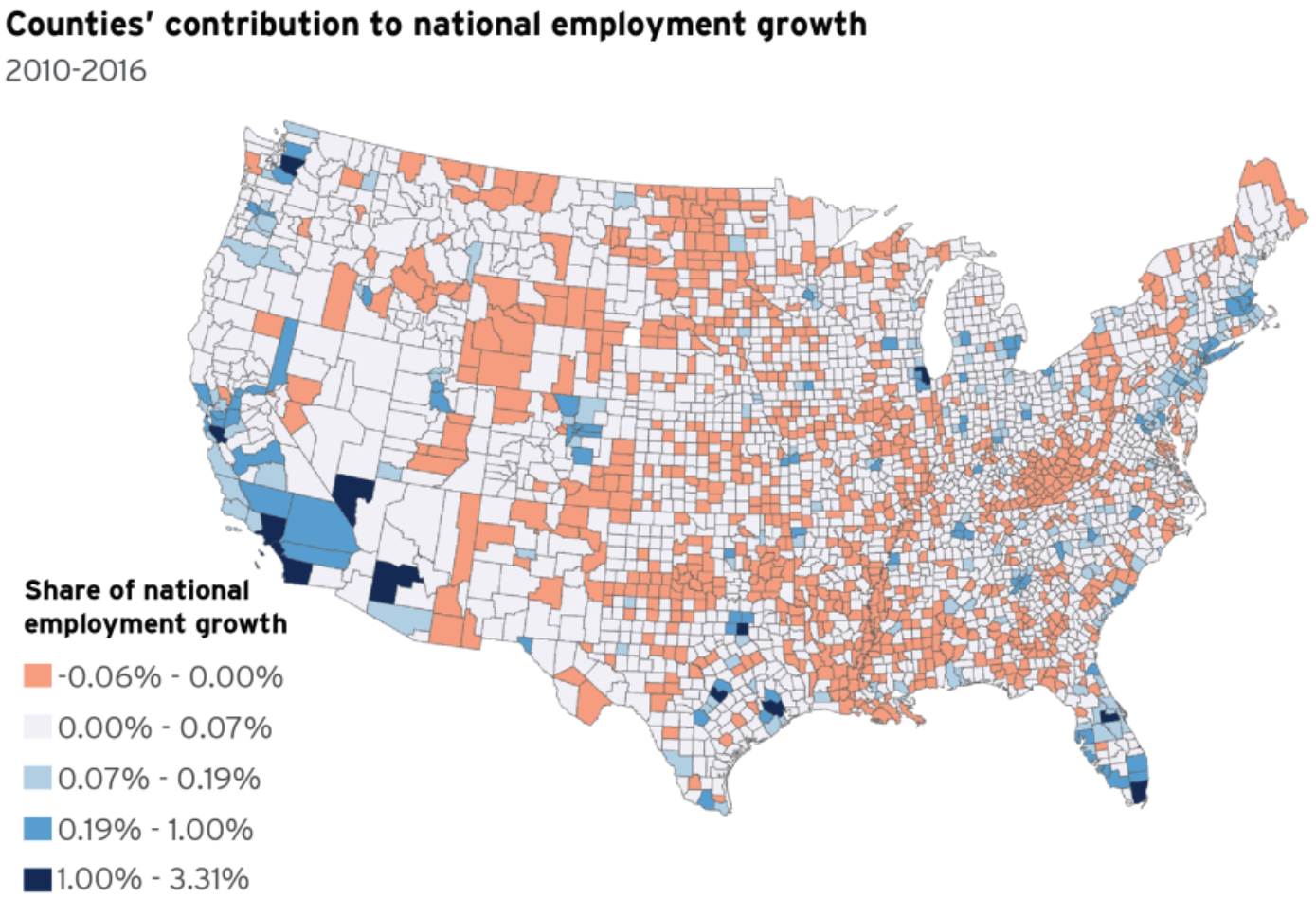
APPENDIX

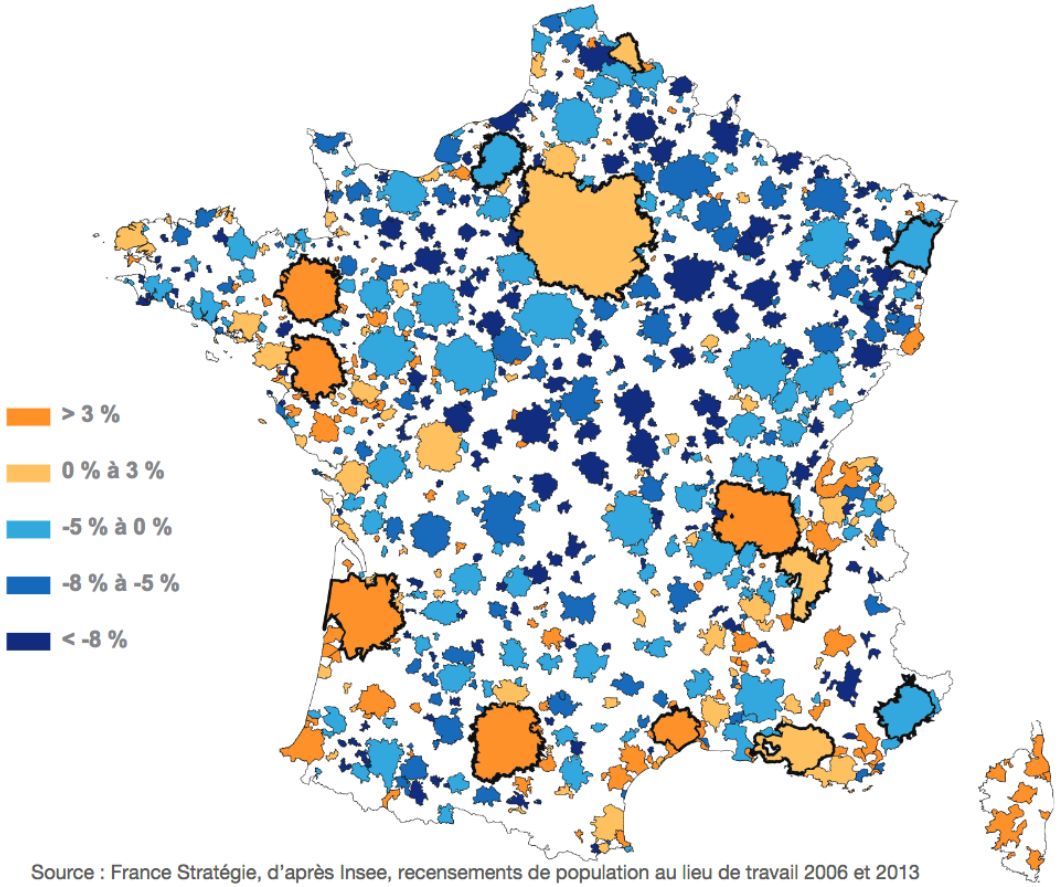
Spatial Heterogeneity (US)



1/2

Spatial Heterogeneity (France)

Carte 2 – Évolution de l'emploi des 25-54 ans entre 2006 et 2013, par aire urbaine

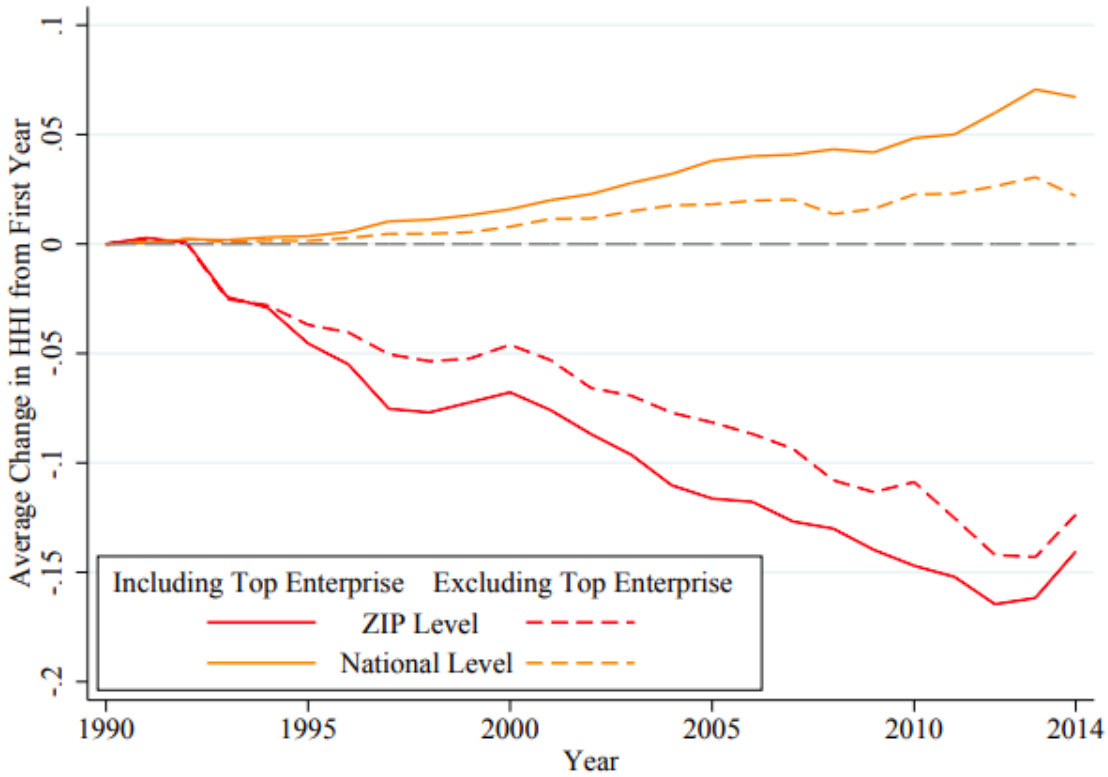


Source : France Stratégie, d'après Insee, recensements de population au lieu de travail 2006 et 2013

Back

Granular component

Figure 8: The role of top enterprises in national and local concentration trends in diverging industries



source: Rossi-Hansberg, Sarte and Trachter, 2018

Back

Firm level optimality

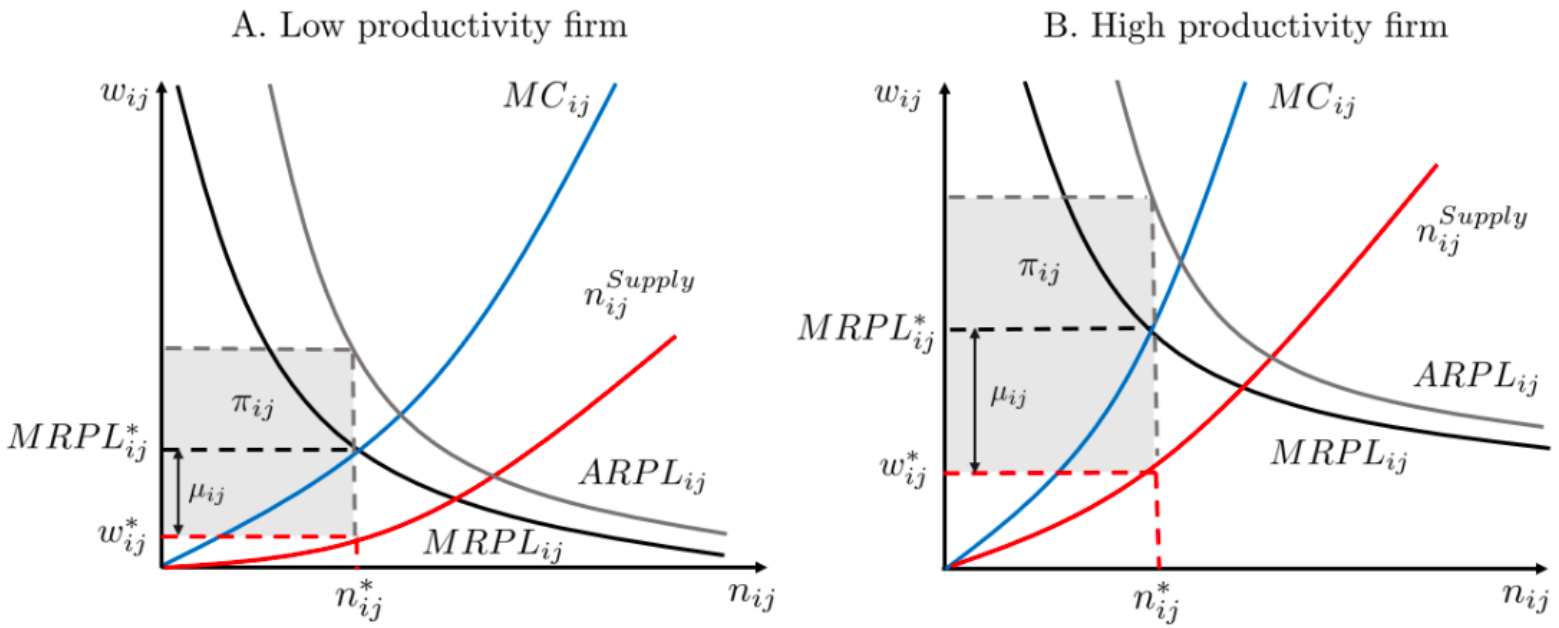


Figure 2: Firm level optimality

Back

Counter Factual

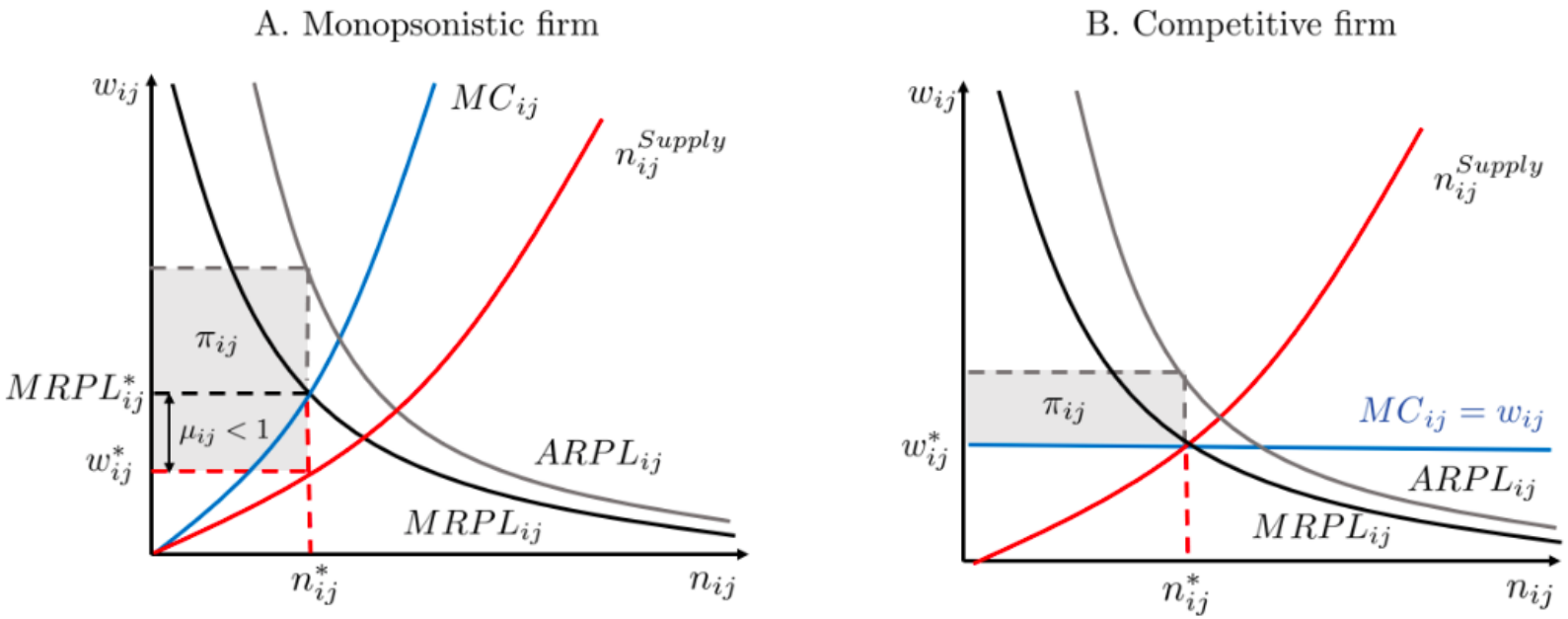


Figure 6: Oligopsonistic vs. Competitive equilibrium

Notes: In a *oligopsonistic equilibrium* (Panel A) the firm understands that its marginal cost MC_{ij} is increasing in its employment. In a *competitive equilibrium* (Panel B) the firm perceives that its marginal cost MC_{ij} is simply equal to its wage, which it takes as given.

Back