Discussion on: "Market imperfections, skills and total factor productivity: Firm-level evidence on Belgium and the Netherlands"

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A tale of two neighbor economies

- Using the empirical framework provided by Dobbelaere and Mairesse (2013)
- The authors offer a typology of product and labour market competition. And ask
- How product competition shapes the distribution total factor productivity?
- How labor market imperfections may influence misallocation of resources?
- What is the role of skills driving productivity?

The perspective of a labor economist

- This is very relevant, most particularly, for a labor economist
- Labor demand theory is essentially a branch of production theory, especially concerned with studying the transmission mechanism running from shocks in to the product market and to prices set in the input markets to employment and wages, the structure of production being an essential component of the transmission mechanism.
- Where empirical work typically relies on assumptions far too strong:

- Perfect product markets
- Perfect labor markets
    - Employment at will (Nickell and Andrews, 1983).
    -
    - Unlike Efficient Bargaining (McDonald and Solow, 1981)
    - or Monopsony power (Manning 2003).

The perspective of a labor economist

On the wage side, there is now overwhelming evidence that the wage policy of the firms accounts for a large part of wage variation:

- Rent sharing
- Production efficiency
- Efficiency wages
- Union power
- Facing upward labor supply (monopsony)

The sources of wage variation: Firm (permanent) heterogeneity

Source: Torres et al., 2013
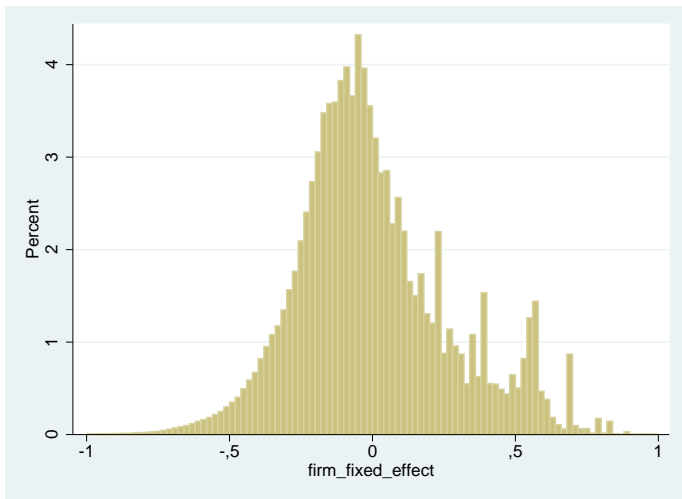
The framework

- The authors build up on the fascinating empirical application of Dobbelaere and Mairesse (2013) that combines (and tests) imperfect labor markets and imperfect product markets.

- Dobbelaere and Mairesse (2013) jointly estimate price-cost markups in the product market and the extent of rent-sharing in the labor market

- Product market imperfections may arise from product differentiation, asymmetric information, ...

- Following Crépon et al. (1999, 2005) it is assumed that employees can gain market power by exploiting costs of firing, hiring and training (efficient bargaining)

- Generating wage differentials not driven by productivity differentials

- The analysis relies crucially on the insight that output elasticities of labor and materials are equal to their revenue shares when prices equal the marginal cost of production (Hall, 1988).

Setup

- Pick the estimates of factor elasticities from the production function ($\widehat{\varepsilon}_M$ and $\widehat{\varepsilon}_N$) and compare with their revenue shares (α_M and α_N) to obtain a parameter of joint market imperfections (ψ)
- $\widehat{\psi}$ determines the regime characterizing the type of competition in the product and labor market

$$\psi_{it} = \frac{(\varepsilon_M)_{it}}{(\alpha_M)_{it}} - \frac{(\varepsilon_N)_{it}}{(\alpha_N)_{it}}$$

- If $\widehat{\psi} > 0$ then the **efficient bargaining model** (McDonald and Solow, 1981) prevails and we can derive estimates for the price-cost markup (μ) and the (absolute and relative) extent of rent-sharing parameters (γ and ϕ)
- If $\widehat{\psi} < 0$ then the **firm monopsony model** applies: search frictions and worker heterogeneity generate upward-sloping labor supply curves to individual firms giving some power to employers

What do with these estimates tell us?

- Classify the industries in Belgium and the Netherlands according the estimates of those parametes

- Taken from a carefully estimated Cobb-Douglas production function

- And found that the most prevalent regime in both Belgium and the Netherlands is Imperfect Product Competition and Efficient Bargaining in the labor market

- The empirical distribution of tfp does not seem to exhibit a discernible pattern across regimes

- High skill firms are exhibit higher total factor productivity grout rates (relevant in the assortative matching literature, e.g., Torres et al., 2013)

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Some trepidation

- The choice of the estimator plays too much of a role defining the regimes

- How nervous should the reader be with the tests on the validity of the instruments?

- What would be the desirable level of spacial aggregation? How confident can we be on the micro-homegeneity of the production function?

- The Cobb-Douglas is very convenient, in particular for the purpose of estimating the market imperfection parameters. But is increasingly restrictive as one considers disaggregated data.

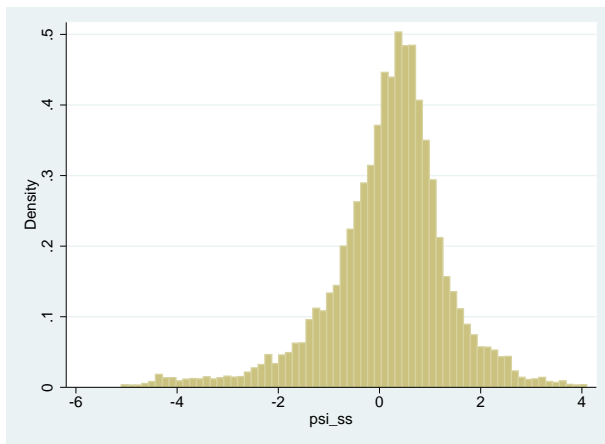# Market Imperfection Parameters: Joint imperfections

Figure : Weighted distribution of $\widehat{\psi}_i$: Manufacturing Sector (firms in the dataset for at least 11 years)

Market imperfections

- IC-EB 1845 firms
- PC-MO 1689 firms
- IC-MO 287 firms
- PC-IB 46 firms
-
- Which, of course, raises the issue of the choice of the mark-up and the labor market imperfection thresholds (1.1 and 0.2)
- How sensitive are classifications to the choice of the thresholds

Labor heterogeneity

- Input heterogeneity (in particular labor inputs) is likely to be critical
- The section on skills and productivity is less convincing because labor heterogeneity was not incorporated in the production function
- We know the it is essential to explain skill-biased technological change and polarization (Autor et al., 2008; Autor and Dorn, 2009)
- And, of course, to properly estimate total factor productivity (Bergstroom and Panas, 1992).

Be aware of the effects of spacial and time aggregation

- Time aggregations likely to bias results against non-convex adjustment cost
- Product aggregation may seriously confound production and labor demand estimation.
- There are other inputs that may require time to adjust.
- The timing of discrete adjustments (e.g., the time to adjust distribution) may provide good matching moments to study the role of adjustment costs (Ejarque and Portugal, 2008; Nilsen and Ejarque, 2008; Varejao and Portugal, 2007)

Conclusions

- To describe six market competition regimes over two countries for 30 industries is probably too much.
    - The comparison between the too countries may gain from being limited to the more aggregate approach.
    - The comparisons of tfp across regimes (and countries) could be organized in terms of (descriptive) regressions.
    - The impact of skills on tfp deserves a less casual approach, but it is craving for data that allows the estimation of production functions with labor heterogeneity.

Other extension are almost natural

    - Obtain alternative estimates of monopsony power (e.g., Webber, 2012)
    - Look at direct measures of worker bargaining power (union density, coverage, etc.)
    - The Inclusion of measures product and labor market imperfection in richer wage equations

BPlim

- The Bank of Portugal is launching a new research unit to promote the analysis of micro data.
  - The researchers of the unit are specialized in the production of micro econometric estimators and techniques.
  - The datasets used and produced at the Bank of Portugal are going to be available to the international academic community.
  - Through a network of powerful virtual computers (sand boxes) that can be accessed anywhere in the world.
  - Provided that a research project was submitted and approved by the head of the research unit.
  - Issues of statistical secret are dealt on a case by case basis.
  - Portuguese micro data is very, very rich.

May be we are too confident about our knowledge of the consequences of labor demand policies

- "The scientific community rewards those that produce strong novel findings. The public, impatient for solutions to its pressing concerns, rewards those who offer simple analysis leading to unequivocal policy recommendations. These incentives make it tempting to maintain assumptions far stronger than they can persuasively defend, in order to draw strong conclusions." in "Policy Analysis with Incredible Certitude," Mansky, 2007, pp 3.

A Three-Way High-Dimensional Fixed-Effect Model

$$y_{ijft} = \lambda_i + \theta_f + \gamma_j + \beta X_{ift} + \epsilon_{ijft} \tag{1}$$

- y_{ijft} represents the logarithm of the hourly wage for each individual i, in job j, working for firm f in year t.
- X_{ift} are observed time-varying characteristics of individual i and firm j in year t.
    - Workers time-varying characteristics (age, age squared, seniority, and seniority squared)
    - Firms time-varying characteristics (log of size)
- λ_i is a worker fixed effect
- θ_f is a firm fixed effect
- γ_j is a job-title fixed effect
- ϵ_{ijft} is an idiosyncratic error term
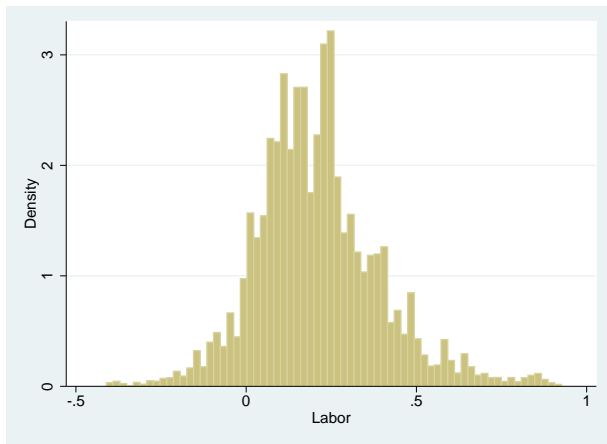
Production Function: Labor

Figure : Weighted distribution of $(\widehat{\varepsilon}_n)_i$: Manufacturing Sector (firms in the dataset for at least 12 years)
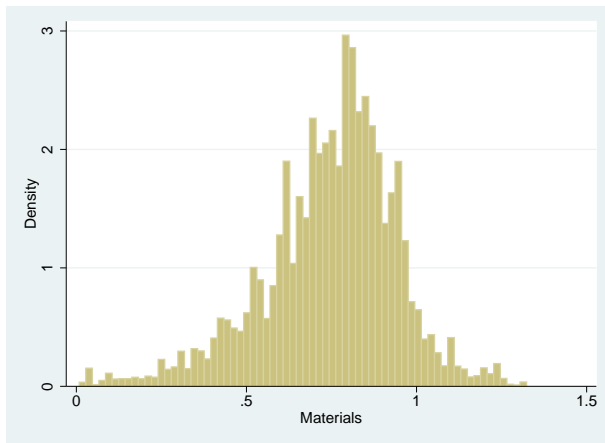
Production Function: Materials

Figure : Weighted distribution of $(\widehat{\varepsilon}_m)_i$: Manufacturing Sector (firms in the dataset for at least 11 years)

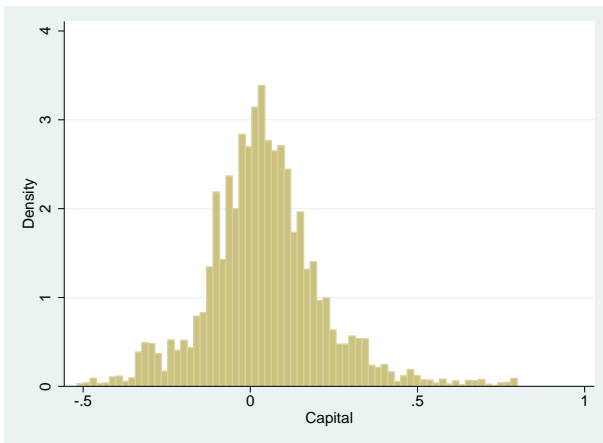# Production Function: Capital

Figure : Weighted distribution of $(\widehat{\varepsilon}_k)_i$: Manufacturing Sector (firms in the dataset for at least 11 years)

Empirical Specification

Bedrock empirical specification for regressions:

$$q_{it} - k_{it} = (\varepsilon_N)[n_{it} - k_{it}] + (\varepsilon_M)[m_{it} - k_{it}] + [\lambda - 1]k_{it} + \zeta_{it}$$

where λ is the elasticity of scale.

- n_{it}: (log) average number of employees in each firm at each year

- k_{it}: (log) gross book value of tangible assets as reported in the firm balance sheets

- m_{it}: (log) intermediate consumption