International Competition and Rent Sharing in French Manufacturing

Lionel Nesta* Stefano Schiavo†

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Abstract

The paper investigates the impact of import competition on rent sharing between firms and employees. First, by applying recent advances in the estimation of price-costs margins to a large panel of French manufacturing firms, we are able to classify each firm into six different regimes based on the presence/absence of market power in both the labor and product markets. Second, we concentrate on firms that operate in an efficient bargaining framework to study the effect of import penetration on workers' bargaining power. We find that imports from OECD countries have a small negative effect, whereas Chinese competition leads French firms to upgrade their products, and thus increases the bargaining power of workers. Moreover, the effect is heterogeneous across firms, so that both the origin of imports and firm-level characteristics play a role in determining the overall impact of international competition. By providing firm-level evidence on the relationship between international trade and rent sharing, the paper sheds new light on the effect of trade liberalization on the labor market.

Keywords: firm heterogeneity; import competition; mark-up; wage bargaining;

JEL Classification: F14; F16; J50

*GREDEG Université Nice Sophia-Antipolis, OFCE SciencesPo and SKEMA Business School. E-mail: lionel.nesta@unice.fr

†University of Trento and OFCE SciencesPo. E-mail: stefano.schiavo@unitn.it

1 Introduction

The recent debate on the pros and cons of new (actual or potential) trade agreements and the associated rise in protectionism sentiments (think of the recent withdrawal by the US from the Trans-Pacific Partnership, the difficult ratification of the EU-Canada Free Trade Agreement, and the dire state of negotiations on the Transatlantic Trade and Investment Partnership between the EU and the US) have brought back on stage concerns about the effects of trade liberalization on labor markets.

These concerns tend to be magnified when trade involves economies with different levels of income per capita, social protection, and labor costs. In fact, the last two decades have witnessed a very sharp increase in trade between OECD countries and emerging economies, due to the rapid integration of some countries (most notably China) into world markets, falling trade costs and the disintegration of production into several stages.

Such heated debates are likely to represent a recurrent theme in the near future, as other emerging economies integrate into world markets and the (alleged) benefits of free trade are further questioned. Hence, understanding how globalization affects European firms and workers represents a crucial question both from an academic and a policy point of view.

Intuitively, we would expect increased competition from abroad to lower domestic firm's profit margins and, as a result, to lower the scope for rent sharing between firms and workers, even in the context of highly regulated labor markets where direct effects on both employment and wage levels might take time to materialize. On the other hand, some firms might respond to price competition from emerging markets by improving product quality, moving upscale and thus increase their price-cost margins. Hence, the impact of import competition on a firm's market power both in the product and in the labor markets may be heterogeneous and remains an empirical issue.

In this paper we combine two streams of the recent empirical literature on market imperfections to determine the product and labor market regimes in which firms operate. More specifically, we build on the methodology developed by De Loecker & Warzynski (2012) to estimate productivity and markups at firm level and combine the results with the approach used by Dobbelaere & Mairesse (2013) and Dobbelaere et al. (2015) to classify sectors according to the (combined) degree of product and labor market imperfections. In this way, we are able to classify firms —not industries— into six different regimes depending on whether they enjoy market power on the product and/or the labor market. To the best of our knowledge this is the first time that such an exercise is performed at the firm level, and this represents the first contribution of the paper.

Moreover, we investigate the relationship between our measure of workers' bargaining power and a number of firm-level characteristics, among which features the degree of import competition from both low-wage and industrial countries. In this way, we test the hypothesis that import penetration acts as a disciplining device in wage bargaining, and we uncover significant heterogeneity across firms. Such heterogeneity is important to analyze because in many countries, and France is one of them, the system of collective bargaining often takes place at

the enterprise level, so that industry-level analysis may hide significant differences among firms operating in the same sector.

The paper is organized as follows: the next section provides a quick overview of recent contributions dealing with the effect of import competition on workers' bargaining power. Section 3 describes the empirical methodology adopted to measure market imperfections, the data used, and presents some descriptive results. In Section 4 we estimate the relationship between import penetration and bargaining power using different econometric techniques. A discussion of the results and some conclusions are then summarized in Section 5.

2 A glance at the existing literature

The impact of trade liberalization on labor market outcomes, such as wages and employment, represents a classical research question in international economics. The literature has tackled it from different angles, alternatively looking at developed or developing countries, wage levels or wage inequality, skill premia vs unemployment. Early studies dating back to the 1990s tend to find little direct effect of trade on labor market outcomes, and convey the broad message that technical change plays a much more prominent role in explaining job losses and wage polarization in industrial countries. However, more recent studies that take into account outsourcing and offshoring in addition to the standard import competition mechanism, tend to give more relevance to trade-related explanations (Dumont et al. 2012). The effect of international trade on workers's bargaining power remains however a much less studied phenomenon. Moreover, while a handful of studies exist on the subject, to the best of our knowledge, none of them has ever addressed the issue at the firm level.

Dumont et al. (2006) analyze evidence for five European countries during 1994–1998. First they estimate sector-level bargaining power from firm microdata, then they investigate its determinant looking in particular at labor composition, R&D intensity, outsourcing practices, market structure and imports from both OECD and emerging economies. For what concerns trade variables, results suggest that only imports from OECD countries have a significant effect on workers' bargaining power.

A similar result emerges from a study on the UK performed by Boulhol et al. (2011). The empirical approach is similar: the authors first estimate both markups and bargaining power (by sector, year and size class), and then regress them on a series of covariates among which one finds the share of imports from both industrial and developing countries in total demand. As before, only imports from high-income countries seem to matter.[1]

Closer to our own approach, at least in spirit, is the work by Abraham et al. (2009) who analyze the price and wage setting behavior of Belgian manufacturing firms in the period 1996–2004, and distinguish between import competition from four country groups, namely EU-15, new EU members, other OECD countries, and the rest of the world. Their model assumes that increased economic integration reduces firms' price-cost margins and thus lowers the size of the rent to share with workers. As a result, workers' bargaining power is reduced. Although Abraham et al.

[1] Boulhol et al. (2011) assume that all firms/sectors are engaged in an efficient bargaining wage setting.

(2009) use firm-level data, they still assume that markups and bargaining power are the same for all firms within the same industry. Their findings suggest that import competition puts pressure on both markups and bargaining power, especially when there is increased competition from low wage countries. The authors conclude that trade integration is associated with wage moderation, which should then yield a positive effect on employment.

Moreno & Rodriguez (2011) address a similar question by looking at the hypothesis that import reinforces market discipline both on product and labor markets. Using a small sample of around 2,000 Spanish firms over the period 1990–2005 they look at both markups and bargaining power, looking at whether import competition affects both the size of economic rents (measured by the Lerner's index) and their distribution between firms and workers. They find a negative effect of import competition on the Lerner's index, that is larger for firms producing final goods. This is consistent with the notion that imports of final goods are more directly in competition with domestic production and therefore put particular pressure on local firms. From the point of view of rent sharing, Moreno & Rodriguez (2011) find that bargaining power is smaller for producers of final and homogeneous goods. Interestingly, this paper presents a first attempt to estimate markups at the firm level, applying the methodology developed by Roeger (1995) (amended to allow for labor market imperfections as in Crépon et al. 2005) to each firm. This implies running firm-level regressions that have between 9 and 15 observations each for a subsample of 885 firms, and then focusing on the distribution of markups rather than on the specific firm-level values.

An interesting extension to the standard theoretical setup that assumes homogeneity among workers is offered by Dumont et al. (2012), who explicitly model bargaining between firms and two types of unions, representing high- and low-skilled workers. The model's implications are then brought to the data using information on Belgian firms. The authors study the determinants of bargaining power at sectoral level, and find that while the bargaining position of high-skilled workers is not affected by either technical change or globalization, low-skilled workers are negatively affected by imports from non-OECD countries (where the wage differential is likely to be larger), offshoring activities, and the presence of foreign affiliated in Central and Easter European countries.

Two recent papers look at the effect of trade liberalization in India, thus taking the vintage point of an emerging economy where market imperfection may be more relevant and where an increase in (foreign) competition could trigger larger efficiency gains. Ahsan & Mitra (2014) focus on the labor share of income following liberalization, but also report results on bargaining power. They find that sectors featuring lower tariff rates before the liberalization display lower bargaining power. Pal & Rathore (2016) exploit state-level variations in the deregulation of both product and labor markets, and find that both types of reforms has led to significant declines in workers' bargaining power, while none of them has had any meaningful effect on firms' price-cost margins.

3 Empirical Strategy

3.1 Measuring Imperfect Markets

Dobbelaere & Mairesse (2013) show that in the context of a gross output production function where factor inputs comprise labor, capital and materials, one can exploit the difference between the markup computed on materials and labor to infer the existence of imperfect competition on both the product and the labor market. The first important working assumption in this context is that both labor (L) and materials (M) are variable inputs.[2] The second key assumption of the paper is to consider that materials prices P^M equalize their marginal product. This assumption allows us to consider the wedge between μ_{it}^M and μ_{it}^L as stemming from imperfections in the labor market. In particular, Dobbelaere & Mairesse (2013) define a joint market imperfection parameter:

$$\Psi_{it} = \frac{\theta_{it}^M}{\alpha_{it}^M} - \frac{\theta_{it}^L}{\alpha_{it}^L} = \mu_{it}^M - \mu_{it}^L$$

whose sign and significance provides us with information on the presence of labor market imperfections. If all markets are perfects, the two terms on the right-hand side should amount to unity. If the product market is imperfect but the two factor markets are perfect, then the terms μ_{it}^M and μ_{it}^L must be strictly equal. Hence the left hand side term Ψ_{it} should be zero. Based on our second working assumption, an inequality in μ_{it}^X ($\Psi_{it} \neq O$) implies the presence of imperfections in the labor market. Based on Hall (1988), Dobbelaere & Mairesse (2013) formally show that Ψ_{it} informs us on three labor market regimes:

1. *Efficient Bargaining* (EB, $\Psi > 0$). Firms and risk-neutral workers bargain over wages and employment level. In this case, it is possible to derive an expression for the absolute extent of rent sharing ($\phi_{it} \in [0, 1]$), i.e. the part of the rent that is appropriated by workers (with $1 - \phi$ being the share going to the firm).

2. *Perfect competition - Right-to-manage* (PR, $\Psi = 0$). In this case the labor market is coined as operating under perfect competition, for neither the firms nor the workers can influence wages.

3. *Monopsony* (MO, $\Psi < 0$). If firms enjoy *monopsony* power, we can derive measure of the elasticity of labour supply with respect to wages β_{LS}.

Exploiting the methodology presented above, we are able to obtain firm-level estimates of the key parameters and therefore we can classify each firm in a different regime with the following procedure. First, we compute the confidence intervals (CI) at 90% level for each firm-level measure of μ_{it}^M and μ_{it}^L in a classical fashion ($\mu_{it}^X < \hat{\mu}_{it}^X \pm z \times \sigma_{\mu_X,it}$) where X stands for either M ort L, $z = 1.64$ and $\sigma_{\mu_X,it}$ is given by:

[2] One could object that labour market is a quasi-variable input, especially in the case of France. However, incorporating it into the model is beyond the scope of the paper.

$$(\sigma_{\mu_X,it})^2 = (\alpha_{it}^X)^{-2} \cdot \left[\sum_w w_{it}^2 \cdot (\sigma_x)^2 + 2 \cdot \sum_{x,z,x \neq z} x_{it} \cdot z_{it} \cdot cov_{xz} \right]$$

where $w = \{1, l, k, lk\}$ and $x, z = \{m, lm, mk, lmk\}$ when $X = M$ and $w = \{1, m, k, mk\}$ and $x, z = \{l, lm, lk, lmk\}$ when $X = L$, where lower cases denote the log transformed variables of capital K, labor L and materials M.

Second, and consistently with the above classification, the comparison of the two confidence intervals allows us to classify the labor market in which each firm operates:

1. EB: *Efficient Bargaining.* If lower bound for the 90% CI μ_{it}^M exceeds the upper bound of the 90% CI for $\mu_{it}LM$, then μ_{it}^M is significantly greater than μ_{it}^L: $\mu_{it}^M > \mu_{it}^L \Rightarrow \Psi_{it} > 0$, at 90% level.

2. PR: *Perfect competition - Right-to-manage.* If the two confidence intervals overlap, then μ_{it}^M is not significantly different from μ_{it}^L: $\mu_{it}^M = \mu_{it}^L \Rightarrow \Psi_{it} = 0$, at 90% level.

3. MO: *Monopsony.* If lower bound for the 90% CI μ_{it}^L exceeds the upper bound of the 90% CI for μ_{it}^M, then μ_{it}^M is significantly lower than μ_{it}^L: $\mu_{it}^M < \mu_{it}^L \Rightarrow \Psi_{it} < 0$, at 90% level.

Observe that to classify firms as operating under perfect or imperfect product market is now straightforward. Using the confidence interval for μ^M, firms are coined as operating in perfect markets if the lower bound of the 90% CI is below unity.

Based on the joint market imperfection parameter, Dobbelaere & Mairesse (2013) identify six different regimes – each being a combination of the types of competition on both the product and the labor market – in which they classify each industry (see Table 1). Results reported in Section 3.3 suggest that there is substantial heterogeneity across firms operating in the same industry: therefore, the ability to account for the different behavior of firms represent an important contribution of our work.

Table 1: Product and labor market regimes

	product market	
labor market	perfect competition	imperfect competition
perfect competition	PC-PR	IC-PR
efficient bargaining	PC-EB	IC-EB
monopsony	PC-MO	IC-MO

3.2 Data

We use data on a large sample of French manufacturing firms based on the *Enquête Annuelle d'Entreprises* (EAE), an annual survey that gathers balance sheets information for all manufacturing firms with at least 20 employees conducted until 2007 by the French Ministry of Industry. The surveyed unit is the legal (not the productive) unit, which means that we are dealing with

firm-level data. We have data for the period 1993–2007, and after some basic cleaning from outliers we have information for about 12,500 firms.[3]

Beside containing the main information from each firm's income statement, the EAE also reports some details on the different activities performed by firms: more specifically, it provides us a list of the 4-digit code of activities in which the firm is active, together with the corresponding number of employees, sales and export. We use this information to derive the relative importance of each activity within the firm and, by linking these weights to data on imports retrieved from the BACI dataset maintained by CEPII (Guillaume Gaulier 2010) we obtain a firm-specific measure of competition from low wage countries, from China, and from OECD members.[4] In this way we can exploit firm-specific heterogeneity in import competition, that would otherwise be masked by the use of sector-level measures of import penetration. The same source of data on each firm's detailed activities is used to compute the share of employees pertaining to high-tech activities within the firm.

Low-wage countries are defined following Bernard et al. (2006): a country is classified as low-wage if its per capita GDP lower than 5% of the US value; our import competition measure is the ratio of French imports (from any specific country or group of countries) over apparent consumption in the same sector, i.e. total sales plus imports minus exports. Since trade data are reported according to the HS classification while the EAE is based on the French industrial classification system (NAF) we have developed a concordance between HS and NAF codes.

3.3 Descriptive Statistics

Tables 2 present information on the fraction of firm belonging to the six different market regimes defined above by looking at the presence of product- and labor-market imperfections. Results are based on a translog production function: Tables A2-A4 in the Appendix report analogous results for the Cobb-Douglas specification and the OLS estimation of the trans-log production function respectively, which are qualitatively similar.[5]

We see that there is substantial heterogeneity both across and within different sectors. Looking at the whole economy, around 41% of firm-year observations fall within of the regimes classified as imperfect competition, meaning that the markup is significantly (from a statistical point of view) but this fraction varies from a lower bound of less then 1% for *Textiles* to a higher bound of almost 100% for *Electric and electronic equipment* and *Printing and publishing*.

For what concerns the labor market, efficient bargaining represent nearly 54% of firm-year observations, followed by right-to-manage (37%) and monopsony, with less than 10% of observations. The single most common joint regime is the IC-EB combination, whereby firms enjoy some degree of market power on both the product and labor market, and the rent is shared with

[3]We keep companies which are present at least 8 consecutive years and for which the annual growth rates never exceed $\pm 100\%$.

[4]For more information on the BACI data, see `http://www.cepii.fr/cepii/en/bdd_modele/presentation.asp?id=1`

[5]In the Cobb-Douglas specification the estimated output elasticities are constant within each sector, so that all the firm-level heterogeneity in μ_L, μ_M and the associated parameters such as Ψ comes from variation in the input shares α_L and α_M. In fact, Table A2 shows that firms are all classified as belonging to the EB labor market regime.

Table 2: Percentage of firms in each market regime by sector: trans-log production function

	Sector name	♯Firm	♯Obs.	PC-PR	PC-EB	PC-MO	IC-PR	IC-EB	IC-MO
C1	Clothing & footwear	1527	11062	57.32	19.27	2.67	1.53	17.12	2.09
C2	Printing & publishing	1629	14346	0.81	0	0.09	7.58	91.02	0.50
C3	Pharmaceuticals	555	4459	41.84	32.01	7.01	2.63	14.92	1.59
C4	House equipm. & furnishings	1457	11622	23.03	25.30	2.035	2.65	44.52	2.46
D0	Automobile	597	5085	61.56	22.44	5.30	1.10	9.15	0.45
E1	Transportation machinery	332	2782	74.70	8.83	3.31	2.80	9.93	0.43
E2	Machinery & mechanical equipm.	3694	31744	17.51	10.17	8.00	5.49	56.19	2.64
E3	Electric & electronic equipm.	1198	9240	0.45	0	0.08	2.25	97.18	0.04
F1	Mineral industries	904	7981	63.32	18.44	7.90	3.15	5.56	1.62
F2	Textile	1254	10278	75.76	4.12	19.22	0.37	0.17	0.37
F3	Wood & paper	1326	11581	57.91	15.58	16.33	1.33	5.72	3.13
F4	Chemicals	2212	19301	19.63	19.63	3.22	4.33	51.38	1.81
F5	Metallurgy, Iron & Steel	3881	34666	44.85	31.60	15.28	0.88	6.72	0.67
F6	Electric & electronic comp.	960	7754	11.39	11.63	2.07	2.60	67.81	4.50
TOT	All manufacturing	20622	181901	33.78	17.22	7.81	3.13	36.32	1.73

Product market regimes: PC = perfect competition; IC = imperfect competition.
Labor market regimes: PR = perfect comp.; EB = efficient bargaining; MO = monopsony.

workers; this regime accounts for 36% of the sample, closely follows by the PC-PR group (close to 34%) representing perfect competition in both labor and product markets.

It is worth noting that the relatively large standard errors associated with the fixed-effects IV estimation of the production function results in wide confidence intervals for the the markup μ and the joint market imperfection parameter Ψ: as a result, participation into the PC and PR product- and labor-market regimes is somehow inflated since the confidence intervals often include zero. In fact, OLS results (see Table A4), which are characterized by lower standard errors (although plagued by endogeneity issues) suggest that a much smaller faction of firms operates in perfect competition.

Table 2 suggests the presence of widespread variations also within each sector. In fact, while in most of the sectors it is possible to identify a prominent regime, in several cases, there at least a second, and often a third, relevant regime that covers a significant fraction of firm-year observations. Hence, characterizing all firms within a sector as belonging to the same regime would imply a significant loss of information and would hide substantial heterogeneity. For instance, 57.32% of the observations within *Clothing and Footwear* are classified as PC-PR, while 17.12% belong to the IC-EB regime and another 19.27% to PC-EB. In *Metallurgy, Iron and Steel* the most common regime (PC-PR) covers 45% of observations, 32% are classified as PC-EB and 15% as PC-MO.

Table 3 summarizes the mean values of the key parameters by industry and for the overall sample of manufacturing firms. The average markup charged by French firms is around 11%, ranging between a 10% *markdown* (a markup lower than 1, see for instance Caselli et al. 2017 for an investigation of this phenomenon) in the textile sector, to a hefty 64% in electric and electronic equipment. Within each sector there is however a substantial difference between firms that have significant market power (i.e. they operate in imperfect competition) and those for which the price is not significantly different from the marginal cost. Columns (2) and (3) highlight

this difference and show that firms classified as price takers have markups not significantly different from 1, while the remaining group manages to charge markups that range between 16% (machinery and mechanical equipment) and 68% (electric and electronic equipment).

Turning to labor market regimes, we see that the share of economic rent that goes to labor (ϕ) in the efficient bargaining setting is around 55% (with some variability across sectors, the min/max values are 48% and 68%). On the other hand, the wage elasticity of labor supply displays substantial variation across industries and is associated with varying degrees of monopsony power.

Table 3: Mean values of key parameters by industry: trans-log production function

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	overall	PC	IC	efficient bargaining			monopsony		
sector	μ	μ	μ	Ψ	γ	ϕ	Ψ	β	$\epsilon_w^{L^s}$
C1	1.192	1.141	1.419	0.522	2.808	0.619	-0.395	0.709	2.672
C2	1.454	0.995	1.469	0.667	2.514	0.602	-0.472	0.730	3.168
C3	1.160	1.076	1.563	0.714	2.104	0.559	-0.664	0.579	1.412
C4	1.127	1.022	1.284	0.470	2.386	0.591	-0.400	0.702	2.708
D0	1.017	0.980	1.347	0.446	2.395	0.591	-0.397	0.685	2.305
E1	1.118	1.067	1.469	0.648	2.079	0.587	-0.682	0.578	1.466
E2	1.078	0.961	1.164	0.348	1.818	0.527	-0.235	0.807	5.349
E3	1.642	1.007	1.675	0.973	3.409	0.684	-0.540	0.682	2.322
F1	0.994	0.963	1.286	0.360	1.706	0.506	-0.327	0.722	2.851
F2	0.899	0.894	1.434	0.366	2.093	0.523	-0.376	0.673	2.230
F3	0.976	0.950	1.218	0.401	1.533	0.493	-0.383	0.690	2.457
F4	1.096	0.979	1.223	0.417	1.694	0.505	-0.319	0.756	3.583
F5	0.933	0.910	1.190	0.255	1.471	0.484	-0.246	0.772	4.084
F6	1.205	1.030	1.302	0.584	2.475	0.600	-0.481	0.682	2.592
Total	1.110	0.974	1.323	0.477	2.085	0.553	-0.288	0.750	3.761

μ: markup, Ψ: joint market imperfection; ϕ: absolute rent sharing; $\gamma = \phi/(1-\phi)$: relative rent sharing; $\epsilon_w^{L^s}$: wage elasticity of the labor supply; $\beta = \epsilon_w^{L^s}/(1-\epsilon_w^{L^s})$: degree of monopsony power.

3.4 Econometric specification

The spirit of the empirical specification we develop in this paper is to allow for the effect of import penetration on rent sharing ϕ to be different according to the degree of market power enjoyed by firms on the product (as captured by μ). In fact, we hypothesize that the degree of rent sharing will depend on the size of the economic rent that the firm is able to generate. The baseline model can be seen as an adaptation of the standard empirical specification which reads as:

$$\phi_{it+1} = \beta_0 + \beta_1 IMP_{it}^s + \beta_2 \epsilon_{it}^{\mu} + \mathbf{BX} + \nu_i + \lambda_t + e_{it}, \tag{1}$$

where IMP_{it}^s is import penetration from source country s. Importantly, import penetration is firm-year specific because we make use of firm sales by industry at the four digit level:

$$IMP_{it}^{s} = \sum_{k} \left(S_{ikt_0}^{d} \times \frac{IMP_{kt}^{s}}{IMP_{kt}} \right) \tag{2}$$

where k identifies all the different industrial sectors in which firm i is active, $S_{ikt_0}^{d}$ represents their individual share in domestic sales in 1994 (the year before our analysis starts, or in the first year in which the firm enters the sample), and IMP_{kt}^{s} denotes imports from country s in sector k at time t. Hence, the import competition measure has features a firm-level heterogeneity that comes from the portfolio of activities of each firm, while its variation over time depends on industry-level imports. In this way we minimize endogeneity concerns.

The variable ϵ_{it}^{μ} captures market power in the product market, net of industry structure and costs. More specifically, it is computes as the residual (plus the constant term) of a regression of the mark-up μ on a polynomial of over five comprising average costs, the number of firms active in the main sector of activity of the firm, and the Herfindahl index for sales (net of firm i). This variable is meant to capture the degree of market power of each firm that is due to firm-specific characteristics —such as quality or brand power– and not depending on the industry structure. $\mathbf{X}$ is a vector of additional controls which includes productivity ω, firm size s, employment growth at the local (NUTS 3) level to control for the tightness of the labor market; ν_i and λ_t are firm i and time t effects and e_{it} is the error term. Observe that rent sharing ϕ, import penetration IMP, product market power ϵ^{μ} all vary across firms and years. The parameters of interest is β_1, that is, the effect of foreign competition on rent sharing.

To allow for an heterogeneous effect of import penetration IMP on ϕ, a natural point of departure is to argue that the latter depends on product quality —that is, ϵ_{it}^{μ} – and therefore to interact IMP with ϵ_{it}^{μ}, yielding the following model:

$$\phi_{it+1} = \beta_0 + \beta_1 IMP_{it} + \beta_2 \epsilon_{it}^{\mu} + \beta_3 IMP_{it} \times \mu_{it} + \mathbf{BX} + \nu_i + \lambda_t + e_{it}, \tag{3}$$

In this setting, the marginal effect of IMP on ϕ depends on ϵ_{it}^{μ}, that is, $\partial\phi/\partial IMP = \beta_1 + \beta_3 \cdot \epsilon_{it}^{\mu}$.

Following a common strategy in the recent (Autor et al. 2013, Hummels et al. 2014, Ashournia et al. 2014, see for instance), we instrument import competition to account for a possible omitted variable bias stemming from factors that simultaneously affect both French imports and a firm's bargaining power vis-a-vis its workers. In equation (2), French imports from source country s in any given 4-digit sector k are then substituted with country s exports to all other counties minus France.[6]

[6]Similar results are obtained using a limited number of non-EU countries, as done by Dauth et al. (2014).

4 Empirical Results

4.1 International Competition and Rent Sharing

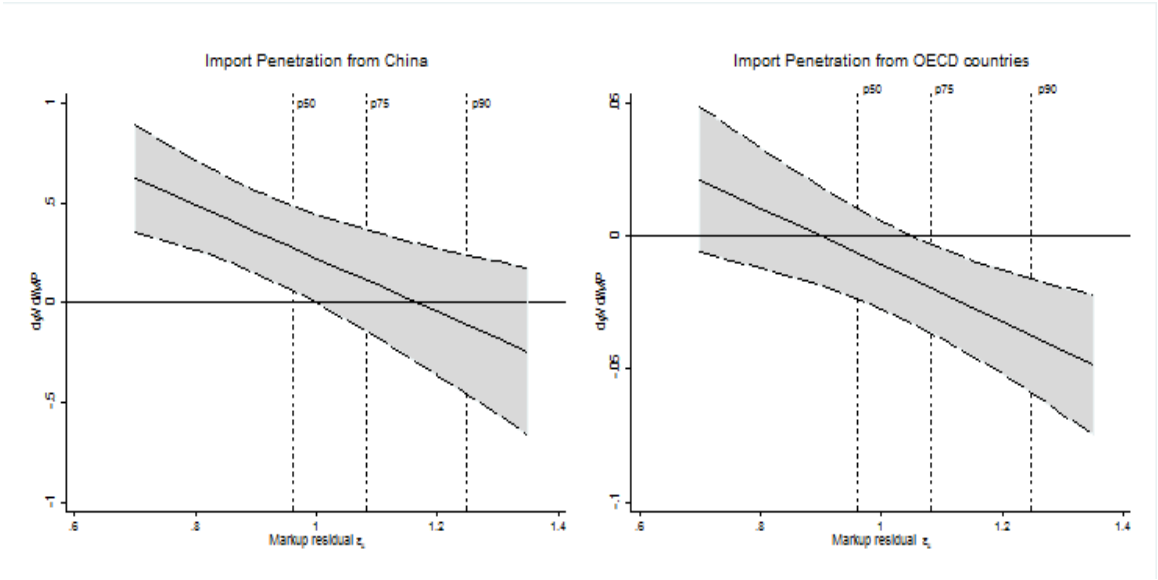
[TO BE COMPLETED]

Table 4: Rent Sharing as a function of International Competition.
Sequential Regressions. Dependent Variable: Rent Sharing $\hat{\phi}$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Import Penetration China	0.287***	0.309***	0.310***	0.204*	1.226***	0.294***	1.555***
	(0.089)	(0.090)	(0.090)	(0.108)	(0.340)	(0.106)	(0.392)
Import Penetration OECD	-0.006	-0.016*	-0.017**	-0.009	-0.015*	0.023	0.096***
	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.029)	(0.036)
Productivity ω		-0.056***	-0.056***	-0.066***	-0.064***	-0.059***	-0.067***
		(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.009)
Size (Log of employment)		0.023***	0.023***	0.016***	0.017***	0.022***	0.015**
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Employment Growth (NUTS 3)			0.007**	0.004	0.004	0.006*	0.003
			(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Markup residual ϵ^{μ}				0.182***	0.201***	0.075*	0.358***
				(0.059)	(0.064)	(0.042)	(0.097)
Mill's Ratio	0.020***	0.024***	0.025***	-0.043*	-0.036*	0.009	-0.058**
	(0.004)	(0.004)	(0.004)	(0.022)	(0.019)	(0.010)	(0.023)
IMP China $\times\epsilon^{\mu}$					-0.961***		-1.333***
					(0.350)		(0.417)
IMP OECD $\times\epsilon^{\mu}$						-0.036	-0.107***
						(0.027)	(0.034)
Observations	49,480	49,480	49,480	49,480	49,468	49,468	49,468
R-squared	0.043	0.047	0.047	0.048	0.048	0.048	0.049
Number of firms	9,198	9,198	9,198	9,198	9,198	9,198	9,198
Weak ID Kleibergen-Paap	472.5	473.7	473.7	456.2	116.2	248.0	53.99
Number of exclusion restrictions	2	2	2	2	3	3	4
RMSE	0.123	0.123	0.123	0.123	0.123	0.123	0.123

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include a full vector of unreported year fixed effects.

Figure 1: Marginal effect of Import Penetration from China and OECD countries on Rent Sharing



4.2 International Competition and Firms' Strategies

[TO BE COMPLETED]

Figure 2: Marginal effect of Import Penetration from China and OECD countries on Competition Strategies

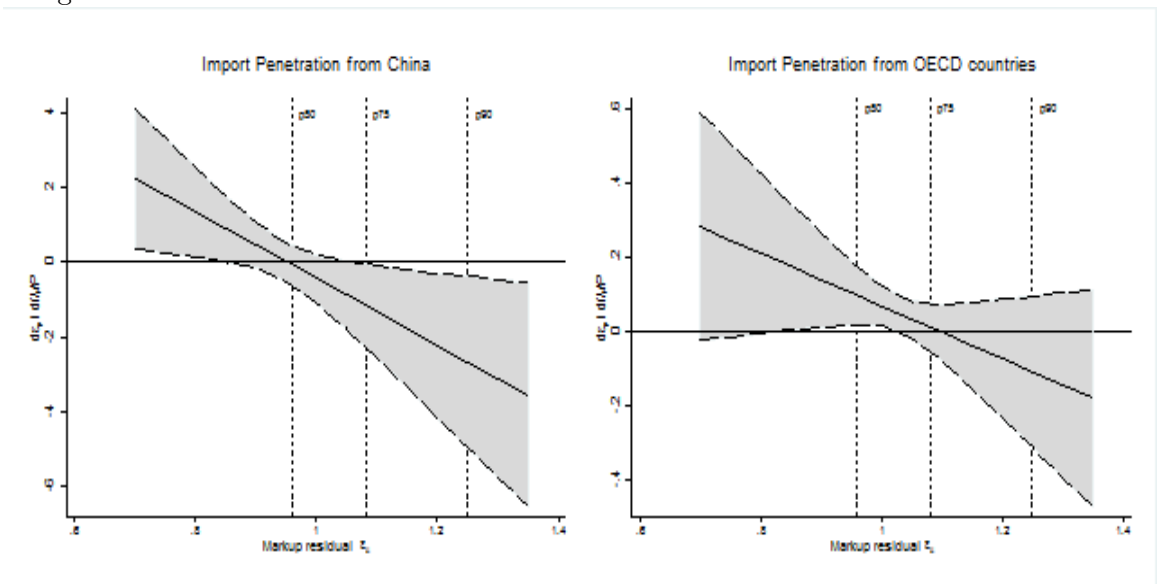


Table 5: Competition Strategies as a Function of International Competition. Sequential Regressions. Dependent Variable: Markup residual $\epsilon_{\mu,t+1}$.

	(8)	(9)	(10)	(11)	(12)	(13)
Import Penetration China	0.512***	0.534***	-0.698	7.877**	-0.683	8.504**
	(0.062)	(0.062)	(0.593)	(3.817)	(0.467)	(3.577)
Import Penetration OECD	-0.021***	-0.032***	0.182*	0.054**	0.435	0.778
	(0.005)	(0.006)	(0.101)	(0.026)	(0.418)	(0.480)
Markup residual ϵ^{μ}			2.522**	1.957***	1.835***	2.701***
			(1.220)	(0.749)	(0.682)	(0.899)
Productivity ω		-0.012**	-0.158**	-0.095***	-0.112***	-0.108***
		(0.006)	(0.065)	(0.027)	(0.035)	(0.028)
Size (Log of employment)		0.044***	-0.065	-0.026	0.007	-0.032
		(0.004)	(0.054)	(0.027)	(0.014)	(0.025)
Share employment in high-tech		-0.017***	0.242**	0.166**	0.119**	0.150***
		(0.006)	(0.121)	(0.065)	(0.056)	(0.057)
Mill's ratio	0.133***	0.140***	-0.848*	-0.500**	-0.387**	-0.558***
	(0.005)	(0.005)	(0.468)	(0.227)	(0.183)	(0.213)
IMP China $\times\epsilon^{\mu}$				-8.028**		-8.940**
				(3.976)		(3.767)
IMP OECD $\times\epsilon^{\mu}$					-0.391	-0.710
					(0.411)	(0.465)
Observations	49,433	49,433	29,885	29,877	29,877	29,877
R-squared	0.149	0.157	-0.153	-0.066	-0.158	-0.067
N. of firms	9,193	9,193	6,705	6,704	6,704	6,704
Weak ID Kleibergen-Paap	469.9	467.7	16.00	3.987	4.429	3.486
N. of exclusion restrictions	2	2	4	6	6	8
Hansen's J			0.521	1.930	0.915	2.757
J p-value			0.470	0.381	0.633	0.431
RMSE			0.0778	0.0748	0.0780	0.0748

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include a full vector of unreported year fixed effects.

4.3 Simultaneous Equations Modeling

[TO BE COMPLETED]

Table 6: Rent Sharing and Competition Strategies as a Function of International Competition.
Simultaneous GMM estimations

	(14)		(15)		(16)		(17)		(18)	
	$\hat{\phi}$	$\epsilon_{\mu,t+1}$	$\hat{\phi}$	$\epsilon_{\mu,t+1}$	$\hat{\phi}$	$\epsilon_{\mu,t+1}$	$\hat{\phi}$	$\epsilon_{\mu,t+1}$	$\hat{\phi}$	$\epsilon_{\mu,t+1}$
Import Penetration China	0.436***	-0.522	1.046***	6.226**	0.416***	-0.672*	1.381***	7.265**	1.369***	6.226**
	(0.099)	(0.325)	(0.349)	(2.781)	(0.100)	(0.343)	(0.412)	(3.029)	(0.411)	(2.781)
Import Penetration OECD	-0.017**	0.038**	-0.018**	0.044**	0.033	0.462	0.089**	0.876**	0.089**	0.044**
	(0.007)	(0.015)	(0.007)	(0.018)	(0.031)	(0.320)	(0.039)	(0.399)	(0.039)	(0.018)
Markup residual ϵ^{μ}	0.035	1.484***	0.140*	1.661***	0.080*	1.828***	0.301***	2.590***	0.298***	1.661***
	(0.029)	(0.433)	(0.071)	(0.542)	(0.041)	(0.525)	(0.110)	(0.816)	(0.110)	(0.542)
Size (Log of employment)	0.043***	0.007	0.039***	-0.014	0.043***	0.008	0.037***	-0.023	0.037***	-0.014
	(0.006)	(0.010)	(0.007)	(0.019)	(0.006)	(0.010)	(0.007)	(0.021)	(0.007)	(0.019)
Productivity ω	-0.049***	-0.105***	-0.053***	-0.087***	-0.050***	-0.110***	-0.057***	-0.104***	-0.056***	-0.087***
	(0.008)	(0.025)	(0.008)	(0.021)	(0.008)	(0.025)	(0.009)	(0.025)	(0.009)	(0.021)
Empl. Growth (NUTS 3)	0.004		0.002		0.004		0.001		0.001	
	(0.004)		(0.004)		(0.004)		(0.004)		(0.004)	
Mill's ratio	0.021**	-0.372***	-0.010	-0.410**	0.019*	-0.378***	-0.034	-0.500***	-0.033	-0.410**
	(0.010)	(0.136)	(0.021)	(0.164)	(0.010)	(0.128)	(0.026)	(0.185)	(0.026)	(0.164)
Share empl. in high-tech		0.133***		0.141***		0.115***		0.128***		0.141***
		(0.040)		(0.047)		(0.036)		(0.045)		(0.047)
IMP China $\times\epsilon^{\mu}$			-0.639*	-6.308**			-1.036**	-7.702**	-1.022**	-6.308**
			(0.371)	(2.865)			(0.454)	(3.197)	(0.453)	(2.865)
IMP OECD $\times\epsilon^{\mu}$					-0.049*	-0.419	-0.104***	-0.815**	-0.104***	
					(0.029)	(0.312)	(0.038)	(0.383)	(0.038)	
Observations	31,829		31,829		31,829		31,829		31,829	
N. of exclusion restrictions	1		2		2		3		2	
Hansen's J	0.002		2.821		0.928		4.507		2.821	
J p-value	0.966		0.244		0.629		0.212		0.244	
Pearson's $r(\epsilon_{\phi}, \epsilon_{\epsilon^{\mu}})$	0.031		0.037		0.030		0.036		0.037	

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include a full vector of unreported year fixed effects.

5 Conclusion

This paper combines recent advances in the estimation of firm-level markups to classify firms into six different regimes based on the presence of imperfections in both the product and labor market. Using a large sample of French manufacturing firms we show that there is substantial heterogeneity in firm behavior both across and within industries, so that being able to properly account for firm-level differences provides us with relevant information.

The methodology adopted in the paper allows us to estimate a measure of workers' bargaining power, that we relate to measures of import competition to investigate how globalization affects rent sharing, while controlling for a number of firm-level characteristics such as average costs, productivity and size. We find that import competition has an heterogeneous effect on workers' bargaining power depending both on the source of imports and the characteristics of the firm. We find three main results: i) import from OECD countries is negatively correlated with the share of economic rent going to workers; ii) competition from China, on the contrary, is positively associated with bargaining power. We interpret this result as suggesting that French manufacturing firms has attempted to escape this type of competition by moving upscale and improving the quality of their products. Indeed, we find that iii) the impact of Chinese competition depends on the quality of the products sold by firms, and its effects are stronger for firms in the lower end of the quality ladder.

The methodology presented in the paper lends itself to several different applications: in particular, the possibility to link firm-level results with detailed information on employees (e.g. their composition in terms of occupations, skills, educational attainments) represents an ideal extension of the work that we would like to pursue in the future.

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Appendix A. Estimation of Production Function

Similar to Hall (1986, 1988) and Roeger (1995), both Dobbelaere & Mairesse (2013) and De Loecker & Warzynski (2012) rely on the production function framework. Unlike previous contributions, however, this framework neither imposes constant returns to scale nor requires the computation of the user cost of capital, a task that is difficult to perform accurately. Finally, this framework provides time-varying and firm-specific estimates of markups and productivity that allow us to unravel the heterogeneity in firms' markup.

Let Q be firm output as follows: $Q_{it} = Q_{it}(\mathbf{X}_{it}, K_{it})$, where subscripts i and t stand for firm i at time t, respectively, K is capital, and $\mathbf{X}$ is a vector of production factors. In this framework, capital is assumed to be fixed, whereas all remaining production factors are variable. We suppose that $Q(\cdot)$ is twice differentiable and continuous and that the objective of the producer is to minimize costs. The associated Lagrangian function then reads

$$\mathcal{L}_{it} = \mathbf{P}_{it}^{X}\mathbf{X}_{it} + r_{it}K_{it} + \lambda_{it}(\bar{Q_{it}} - Q_{it}(\mathbf{X}_{it}, K_{it})), \tag{A1}$$

where P_{it}^{X} and r_{it} are firm input prices for input vector $\mathbf{X}$ and capital, respectively.

The first-order conditions satisfy

$$\frac{\partial \mathcal{L}_{it}}{\partial \mathbf{X}_{it}} = P_{it}^{X} - \lambda_{it}\frac{\partial Q_{it}(\mathbf{X}_{it}, K_{it})}{\partial \mathbf{X}_{it}} = 0 \tag{A2}$$

and

$$\frac{\partial \mathcal{L}_{it}}{\partial Q_{it}} = \lambda_{it}, \tag{A3}$$

which implies that λ_{it} represents the marginal cost of production.

Rearranging (A2) and multiplying both sides by $\frac{X_{it}}{Q_{it}}$ yields

$$\frac{\partial Q_{it}(\mathbf{X}_{it}, K_{it})}{\partial \mathbf{X}_{it}}\frac{\mathbf{X}_{it}}{Q_{it}} = \frac{P_{it}^{X}\mathbf{X}_{it}}{\lambda_{it}Q_{it}}. \tag{A4}$$

The term on the left-hand side of Equation A4 is the output elasticity of the variable inputs $\mathbf{X}_{it}$, whereas the right-hand-side term is its share in total cost.[7] Now, defining firm markups μ as the price to marginal cost $\mu_{it} \equiv \frac{P_{it}}{\lambda it}$, it follows that $\lambda_{it} \equiv \frac{P_{it}}{\mu_{it}}$. Inserting the former into Equation A4 and simplifying yields

$$\mu_{it}^{X} = \frac{\theta_{it}^{X}}{\alpha_{it}^{X}}, \tag{A5}$$

where the numerator $\theta_{it}^{X} = \frac{\partial Q_{it}(X_{it}, K_{it})}{\partial X_{it}}\frac{X_{it}}{Q_{it}}$ represents the output elasticity of input $\mathbf{X}_{it}$ and the denominator $\alpha_{it}^{X} = \frac{P_{it}^{X}\mathbf{X}_{it}}{P_{it}Q_{it}}$ is the share of input $\mathbf{X}_{it}$ in total sales. Hence, to compute the

[7] This is true when at the optimal point of production, the marginal cost equalizes the average cost due to the free entry of firms into the market.

markup μ_{it}, we need to compute both θ_{it}^X and α_{it}^X per firm and per time period. Although it is straightforward to compute α_{it}^X, the estimation of θ_{it}^X is more demanding.

At the outset, two important choices need to be made explicit. First, we limit the set of variable inputs to labor L and M. Theoretically, if all factor markets were perfect, the markup derived from material must yield the same value as the markup derived from labor: $\mu_{it}^M = \mu_{it}^L$. However, differences in factor markets' imperfections will yield different values of firm markups ($\mu_{it}^M \neq \mu_{it}^L$). Hence the wedge between μ_{it}^M and μ_{it}^L will be used to infer factor market imperfections. This also implies that we define output Q as gross output.

The second important choice involves the functional form of $Q(\cdot)$. The most common candidate is the Cobb-Douglas framework. This functional form would yield an estimate of the output elasticity of labor that would be common to the set of firms to which the estimation pertains: $\hat{\theta}_{it}^L = \hat{\theta}^L$, hence, $\hat{\theta}_{it}^L = \hat{\theta}_{jt}^L$ for all firms i and j, $i \neq j$, included in the estimation sample. It follows that the heterogeneity of firm markups and the ratio of the output elasticity of labor on its revenue share would simply reflect heterogeneity in the revenue share of labor: $\mu_{it}^L = \frac{\theta^X}{\alpha_{it}^L}$. Therefore, we prefer to use the translog production function because it generates markups whose distribution is not solely determined by heterogeneity in the revenue share of labor, as will be clear below.

Several different methods exists to estimate the production function. Here we follow Wooldridge (2009), i.e. a modification of the approach proposed by Levinsohn & Petrin (2003) and Ackerberg et al. (2015) to control for unobserved productivity shocks using intermediate inputs. Wooldridge (2009) proposes a joint estimation method that sidesteps some of the drawbacks associated with the the control function (two-step) procedures and leads to more efficient estimators. Table A1 reports the estimated output elasticities of the three production factors K, L and M using the Cobb-Douglas and the preferred translog specifications. We also report the estimated scale factor η computed as the sum of the three output elasticities $\eta = \hat{\theta}^K + \hat{\theta}^L + \hat{\theta}^M$.

Table A1: Output Elasticities $\hat{\theta}$ for K, L and M and the corresponding scale economies $\hat{\eta}$.
Cobb-Douglas and Translog specifications using the Wooldridge estimator.

Industry	♯ Obs.	α_L	α_M	$\hat{\theta}^K_{cd}$	$\hat{\theta}^L_{cd}$	$\hat{\theta}^M_{cd}$	$\hat{\eta}_{cd}$	$\hat{\theta}^K_{tl}$	$\hat{\theta}^L_{tl}$	$\hat{\theta}^M_{tl}$	$\hat{\eta}_{tl}$
All manufacturing	181,901	0.331	0.613	0.068	0.228	0.632	0.928	0.071	0.268	0.630	0.969
Automobile	5,085	0.262	0.703	0.071	0.165	0.674	0.910	0.066	0.201	0.684	0.951
Chemicals	19,301	0.264	0.681	0.084	0.161	0.690	0.934	0.065	0.195	0.720	0.980
Clothing and footwear	11,062	0.450	0.512	-0.010	0.272	0.777	1.039	0.098	0.405	0.537	1.041
Electric and Electronic components	7,754	0.327	0.617	0.050	0.216	0.641	0.907	0.022	0.229	0.711	0.962
Electric and Electronic equipment	9,240	0.372	0.585	-0.028	0.227	0.862	1.061	-0.037	0.243	0.837	1.043
House equipment and furnishings	11,622	0.337	0.635	0.086	0.226	0.610	0.922	0.076	0.246	0.682	1.003
Machinery and mechanical equipment	31,744	0.335	0.616	0.058	0.263	0.605	0.926	0.056	0.282	0.643	0.982
Metallurgy, Iron and Steel	34,666	0.353	0.574	0.118	0.236	0.515	0.869	0.120	0.294	0.496	0.911
Mineral industries	7,981	0.314	0.637	0.094	0.232	0.591	0.918	0.114	0.256	0.594	0.963
Pharmaceuticals	4,459	0.239	0.677	0.047	0.097	0.873	1.017	0.067	0.148	0.746	0.961
Printing and publishing	14,346	0.345	0.576	-0.005	0.253	0.768	1.017	-0.008	0.275	0.773	1.040
Textile	10,278	0.332	0.612	0.146	0.221	0.425	0.792	0.137	0.295	0.486	0.918
Transportation machinery	2,782	0.337	0.616	0.084	0.278	0.589	0.951	0.089	0.296	0.654	1.040
Wood and paper	11,581	0.276	0.671	0.066	0.224	0.602	0.892	0.067	0.260	0.626	0.953

Supercript *cd* stands for the Cobb-Douglas specification. Superscript *tl* stands for the translog specification.

Cobb-Douglas specification

Table A2: Percentage of firms in each market regime by sector: Cobb-Douglas production function

	Sector name	♯Firm	♯Obs.	PC-EB	IC-EB
C1	Clothing and footwear	1527	11062	35.87	64.13
C2	Printing and publishing	1629	14346	4.614	95.39
C3	Pharmaceuticals	555	4459	51.80	48.20
C4	House equipment and furnishings	1457	11622	68.29	31.71
D0	Automobile	597	5085	90.26	9.739
E1	Transportation machinery	332	2782	84.53	15.47
E2	Machinery and mechanical equipment	3694	31744	33.83	66.17
E3	Electric and Electronic equipment	1198	9240	3.286	96.71
F1	Mineral industries	904	7981	60.05	39.95
F2	Textile	1254	10278	79.85	20.15
F3	Wood and paper	1326	11581	75.42	24.58
F4	Chemicals	2212	19301	52.34	47.66
F5	Metallurgy, Iron and Steel	3881	34666	54.97	45.03
F6	Electric and Electronic components	960	7754	50.89	49.11
	All Manufacturing	20622	181901	45.52	54.48

Product market regimes: PC = perfect competition; IC = imperfect competition.
Labor market regimes: EB = efficient bargaining.

Table A3: Mean values of key parameters by industry: Cobb-Douglas production function

	overall	PC	IC	efficient bargaining		
sector	μ	μ	μ	Ψ	γ	Φ
C1	1.350	1.113	1.269	1.588	4.899	0.702
C2	1.407	1.228	1.509	0.537	2.694	0.593
C3	1.355	1.026	1.369	0.788	2.103	0.537
C4	1.084	1.076	1.355	0.210	2.587	0.563
D0	1.035	0.992	1.409	0.199	2.432	0.558
E1	1.100	1.084	1.510	0.0289	2.495	0.557
E2	1.094	1.039	1.148	0.140	2.559	0.567
E3	1.530	1.180	1.656	0.899	3.136	0.629
F1	1.106	0.960	1.115	0.0239	2.559	0.555
F2	1.154	0.893	1.027	-0.163	3.022	0.591
F3	1.020	0.963	1.077	-0.0309	2.184	0.513
F4	1.089	1.022	1.256	0.305	2.100	0.524
F5	1.095	0.900	1.001	0.124	2.517	0.572
F6	1.136	1.118	1.383	0.350	2.544	0.559
Total	1.171	1.011	1.304	0.308	2.656	0.572

μ: markup, Ψ: joint market imperfection; ϕ: absolute rent sharing; $\gamma = \phi/(1-\phi)$: relative rent sharing.

OLS estimation of trans-log specification

Table A4: Percentage of firms in each market regime by sector: OLS estimation of trans-log production function

	Sector name	♯Firm	♯Obs.	PC-PR	PC-EB	PC-MO	IC-PR	IC-EB	IC-MO
C1	Clothing and footwear	1527	11062	4.216	1.702	1.349	1.597	90.72	0.419
C2	Printing and publishing	1629	14346	3.303	1.179	1.196	9.140	84.05	1.137
C3	Pharmaceuticals	555	4459	10.40	2.047	1.010	14.36	71.81	0.382
C4	House equipment and furnishings	1457	11622	4.010	2.776	0.679	2.369	90.05	0.111
D0	Automobile	597	5085	20.18	6.296	2.149	8.268	62.91	0.202
E1	Transportation machinery	332	2782	27.67	1.155	7.271	14.88	47.65	1.369
E2	Machinery and mechanical equipment	3694	31744	4.170	2.147	2.811	4.151	85.93	0.791
E3	Electric and Electronic equipment	1198	9240	1.154	0.225	0.360	1.918	96.19	0.150
F1	Mineral industries	904	7981	11.27	7.175	1.348	5.743	74.25	0.216
F2	Textile	1254	10278	8.453	2.059	7.056	10.87	67.54	4.022
F3	Wood and paper	1326	11581	18.43	4.006	8.796	11.87	55.90	1.001
F4	Chemicals	2212	19301	11.93	7.567	2.643	7.224	69.79	0.848
F5	Metallurgy, Iron and Steel	3881	34666	9.073	8.637	7.663	4.198	69.16	1.269
F6	Electric and Electronic components	960	7754	3.574	2.984	0.759	2.006	90.49	0.185
	All Manufacturing	20622	181901	8.221	4.343	3.856	5.987	76.62	0.971

Product market regimes: PC = perfect competition; IC = imperfect competition.
Labor market regimes: PR = perfect comp.; EB = efficient bargaining; MO = monopsony.

Table A5: Mean values of key parameters by industry: OLS estimation of trans-log production function

	overall	PC	IC	efficient bargaining			monopsony		
sector	μ	μ	μ	Ψ	γ	Φ	Ψ	β	$\epsilon_w^{L^s}$
C1	1.235	0.953	1.290	0.678	2.903	0.625	-0.664	0.706	5.094
C2	1.253	0.962	1.285	0.525	2.101	0.545	-0.321	0.795	5.064
C3	1.212	0.955	1.281	0.757	1.753	0.503	-0.457	0.693	2.479
C4	1.160	0.947	1.218	0.550	2.360	0.587	-0.295	0.771	4.323
D0	1.101	0.958	1.188	0.470	2.053	0.547	-0.266	0.783	4.078
E1	1.122	0.955	1.235	0.534	1.927	0.539	-0.374	0.731	3.330
E2	1.150	0.947	1.193	0.444	2.062	0.556	-0.259	0.828	6.834
E3	1.338	0.945	1.379	0.753	2.848	0.633	-0.332	0.759	3.909
F1	1.124	0.950	1.213	0.471	1.780	0.501	-0.240	0.805	5.152
F2	1.155	0.947	1.223	0.517	1.898	0.510	-0.287	0.812	5.704
F3	1.087	0.955	1.168	0.485	1.580	0.487	-0.266	0.790	4.670
F4	1.106	0.947	1.190	0.447	1.682	0.497	-0.289	0.787	4.670
F5	1.114	0.944	1.191	0.421	1.709	0.504	-0.222	0.825	6.615
F6	1.202	0.966	1.252	0.661	2.507	0.604	-0.359	0.749	4.134
Total	1.159	0.949	1.227	0.514	2.041	0.542	-0.275	0.806	5.786

μ: markup, Ψ: joint market imperfection; ϕ: absolute rent sharing; $\gamma = \phi/(1-\phi)$: relative rent sharing; $\epsilon_w^{L^s}$: wage elasticity of the labor supply; $\beta = \epsilon_w^{L^s}/(1-\epsilon_w^{L^s})$: degree of monopsony power.