Unions, Imports, and Wages: Evidence from data matching imports, firms, and workers

Francis Kramarz*
CREST-INSEE, CEPR, and IZA.

April 19, 2005

*I would like to thank audiences of various seminars and conferences whose suggestions were particularly helpful. Discussions with John Abowd, Sandra Black, David Blau, Pierre Cahuc, Bruno Crépon, Pietro Garibaldi, Anke Kessler, Samuel Kortum, Jacques Melitz, Fabien Postel-Vinay, Jean-Marc Robin, and Bernard Salanié led to numerous improvements. I would also like to thank those persons who helped me in constructing and understanding the data sets that I use in this paper, Henri Tyrman, Marie Leclair, Françoise Le Gallo, Sébastien Roux, and Rémi Mougin. Previous versions of this paper were presented at various conferences, the Euroconference on immigration in Porto, the NBER Labor Studies Group summer meeting, CEPR Florence conference on Labor Demand, and seminars at Crest, the Tinbergen Institute in Amsterdam, the University of Stockholm. The data used in this paper are confidential but the author's access is not exclusive. Other researchers interested in using these data should contact the Centre de Recherche en Economie et Statistique, 15 bd Gabriel Péri, 92245 Malakoff, France.

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Abstract: How are wages and employment of manufacturing workers affected by the sourcing strategies of their employing firm and those of their competitors ? I answer this question using unique French data that matches firm-level information, in particular imports, with individual worker data. A simple bargaining model, particularly well-suited to the French institutional setup, allows me to capture the mechanisms by which imports can directly affect wages: changes in the quasi-rent (the total pie shared between the workers and the firm) as well as changes in trade competition and sourcing strategies that potentially affect the bargaining process by altering both the firm's and the workers' threat points. I use an IV strategy where export prices of American firms act as instruments for outsourcing. I find that workers' wages decline with competitive pressure from outsourcing and that workers get 20% of the quasi-rent . To further investigate these effects, I match my data with information on firm-level negotiations between firms and unions. As expected, in firms with strong unions (those able to impose bargaining on both employment and wages) workers are able to capture a large share of the quasi-rent (about 50%). However, the presence of strong unions also leads firms to increase outsourcing with an associated decline in employment. As a result, unions' fight for workers' wages and employment appears to have backfired.

JEL codes: F3, F4, J30

1. Introduction

The media have expressed the popular feeling that low-skilled manufacturing jobs have been disappearing from OECD countries because of global competition from low-wage countries. The issue is well summarized by Richard Freeman: "Put crudely, to what extent has, or will, the pay of low-skilled Americans or French or Germans be set in Beijing, Delhi or Djakkarta rather than in New-York, Paris or Frankfurt ?" (Freeman, 1995, page 16).

Imports from developing countries into the United States or Western Europe were not huge at the end of the 80s but were increasing at a very rapid pace.[1] But their mere existence was a signal that outsourcing was a potential threat, in particular for industries or firms in which high wages were due to the presence of strong unions and the absence of product market competition.

Hence, the question that I examine derives from the previous one: Was outsourcing a possible response to high wages, strong unions, in a context of increased competitive pressures ?

Even though macro-economists have examined these questions both theoretically and empirically, at the country or the industry level, there is virtually no micro-econometric analysis, no empirical examination of the precise mechanisms at work using micro data sources. I will look at the effects that can be identified in the French context using differences across and within firms rather than across industries. For instance, I observe the individual firms that outsource, the plants that downsize, the strength of particular unions, and the changes in individual, not aggregate, wages.

A clear answer to Richard Freeman's question as well as mine would contribute to at least two strands of the literature. First, it would inform the wage inequality debate.[2] Second, because product market competition is a potential underlying mechanism causing

[1] French National accounts show that imports increased at a very fast pace over the years 1986 to 1992: above 6% per year in the first five years with a decrease to 3% in 1991 and 2% in the final year. In fact, whereas import growth was at best mild between 1981 and 1985, our sample period appears to be the beginning of a period of rapid growth of French imports, that continued most of the ensuing years. http://www.insee.fr/fr/indicateur/cnat_annu/Series/t_1501p_25_4.xls (accessed April 5, 2005).

[2] On one side, Lawrence (1994), Lawrence and Slaughter (1993), Krugman (1995) have argued that recent changes cannot be accounted for by increased trade with low-wage countries. On the other, Wood (1995) has accused trade of being responsible for the deteriorated position of unskilled workers while Leamer (1994) and (1996), and Freeman (1995) appear to stand in the middle. Unfortunately, evidence is not compelling and mostly relies on import penetration measured at the aggregate or at the sectoral level (see for instance Revenga, 1992, see however Bernard and Jensen, 1997 or the book edited by Robert Feenstra, 2000).

some of the changes affecting the labor market, an answer would also contribute to the literature that examines the relationship between wages and profits.[3]

I start by presenting simple descriptive evidence on how trade competition affected employment and wages at the end of the eighties in France. I also sketch the story that, I think, describes best this evidence.

Then, I propose a simple bargaining model, particularly well-suited to the French institutional setup. This framework will help me capture the mechanisms by which imports can directly affect wages.

To understand the identification strategy that I pursue, the following thought experiment is helpful. Many French firms bargain with their workers, but not all. These bargaining regimes vary from firm to firm. However, all firms are hit by exogenous foreign competition shocks, including exogenous opportunities for outsourcing. For instance, competitors' imports or the firm's sourcing strategies have the potential to affect the bargaining process because they may change both the firm's and the workers' threat points. What happens to wages and employment in these different firms and under the different bargaining regimes ?

To answer this question, I implement the set of equations derived from a bargaining model using matched employer-employee data. Information on a worker's wage and characteristics is matched with the characteristics of the worker's employing firm; in particular, its imports, value-added, capital stock, and employment. The use of such unique data sources linking the firm and the worker, and linking imports to individual firms is one of the contributions of this paper.

I then explore empirically how wages and employment of manufacturing workers are directly affected by the sourcing strategies of their employing firm, by the sourcing strategies of the firm's direct competitors, and by the sourcing strategies of those wholesale and retail trade firms that import finished goods similar to those produced by the workers' employing firm.

My results show that wages decline when product market competition and competitive pressure increase. This negative effect mostly comes from trade competition that deteriorates the workers' threat point in the bargaining process when many of the firm's

[3] Abowd and Lemieux (1993) examine the relation between product market competition and wages in a bargaining framework whereas Blanchflower, Oswald and Sanfey (1996) look at the more general relation between profits and wages. Goldberg and Tracy (2001) as well as Bertrand (2004) focus on recent changes induced by increased import competition and movements in exchange rates. Unfortunately, these last authors used industry-level measures of imports because of the lack of firm-level data.

competitors import. However, the origin of imports has no strong direct impact on wages: competition from low-wage countries mostly shows up in employment effects (for this, see Biscourp and Kramarz, 2003 and 2004). The estimates also indicate that workers receive 20% of the quasi-rent.

To delve further into the mechanisms at work, I then examine the relationship between unions behavior and firms imports. Therefore, I match my 120,000 observations with the 1992 survey on salary structure (ESS) that provides information on the bargaining activity at a representative sample of establishments and firms. The sample is reduced to roughly 40,000 observations for which I know the bargaining regime; in particular I know if workers and firms negotiated over both employment and wages. For those firms, my results show that workers capture half of the quasi-rent. But they also suggest that these firms have used outsourcing in order to decrease their employment because of increased labor costs and strong unions.

The paper is organized as follows. To motivate my theoretical model, I start (Section 2) by introducing simple descriptive evidence. In Section 3, I present the simplified theoretical role of imports in the bargaining process. Then, I discuss the empirical implementation of my model. In Section 5, estimation results are presented and potential interpretations are presented. A brief conclusion ends the paper.

2. Import Competition and Firm Outcomes: Simple Descriptive Evidence

For years, many French firms have enjoyed the protection of various regulations, subsidies, tariffs, and entry restrictions. In addition, because of collective agreements (first signed by large firms and then extended in the 1970s by the Ministry of Labor to virtually every firm and every worker in the manufacturing sector), firms faced strong union power, and high minimum wages. Small firms, which typically depend on lower labor costs, were in a difficult position to compete against larger companies. Entry and growth of potential competitors was reduced. All these facts have generated rents in many industries. These rents were directly reflected into wages, particularly in the large firms.[4]

However, in more recent years, foreign competitors have entered the French scene. Simultaneously, new markets opened. In response, some of those large French firms in-

[4] See Abowd, Kramarz, and Margolis (1999) for evidence on France. More recently Abowd, Kramarz, Lengermann, and Roux (2005) analyze inter-industry wage differences in France and in the United States and show that the firm-specific component of these differentials is associated both with monopoly power on the firms side and union power on the workers side, in France at least.

creased their imports of intermediates and launched outsourcing strategies. And, indeed, competition became fiercer. The early "equilibrium" started to unravel.

In our period of analysis, 1986 to 1992, large French manufacturing firms often imported (see also Biscourp and Kramarz, 2004). Their rents were strongly affected by import competition (see below). These firms have also lost employment (again, see below). But, unions in these large firms have strongly resisted any change in strategy. This resistance was facilitated by the Lois Auroux, voted in 1981 just after François Mitterrand's presidential election. These laws enhanced workers' bargaining power at the level of the firm.[5] This resistance has potentially magnified the effects of high labor costs, inducing manufacturing firms to increase their outsourcing and replace workers with imports.

In the rest of this section, and before turning to more structural results, I want to present simple descriptive evidence on the mechanisms described above. Most of this evidence relies on worker-level and firm-level sources that are fully described in the Data Appendix Section. I briefly mention these sources now to help the reader understand the evidence presented below.

First, as mentioned in the introduction, the French Customs provides me with exhaustive information on imports of goods at the firm level. I separate these imports of goods into (i) imports of intermediates and (ii) imports of finished goods depending on the industry affiliation of the firm and industry classification of the imported good. More precisely, each record of the origin file of imports of goods contains a firm identifier, a country of origin, an amount expressed in Francs, and a 3-digit classification of the good. If the 3-digit industry affiliation of the importing firm and the 3-digit classification of the imported good are identical, I code the import as an import of finished goods. All other imports are coded as imports of intermediates. In what follows, I equate finished goods imports with outsourcing.

To measure the import competition that each firm faces in its industry, I aggregate the imports using the 3-digit classification of the imported good. To measure the import behavior of the industry competitors, for each firm I compute the ratio of imports of finished goods over production and the ratio of imports of intermediates over local purchases. Then, I compute percentiles of the resulting statistics by industry affiliation of the importing firm (4-digit). These percentiles measure the extent of import competition

[5] The Lois Auroux explicitly include the obligation to negotiate for establishment or firms with at least 50 employees, see Cahuc and Kramarz, 1997 for a description of their principles see also Abowd and Allain, 1996 who provide evidence supporting this claim.

in each industry.[6][7] These measures of imports at the firm-level or at the industry-level can be matched with measures of profitability (from other administrative sources). In particular, I construct a measure of the size of the "pie" that the firm and its workers divide between them, that I call the *quasi-rent* hereafter. This quasi-rent is measured as value-added minus labor costs evaluated at the **workers' opportunity wage** (I describe in Section 4 how this opportunity or market wage is measured).

My first piece of evidence is presented in Table 1. The table shows different regressions with a similar format: a firm-level variable (employment, quasi-rent, labor costs per employee) is regressed on measures of import competition in the firm's industry.[8] In each column, the firm variable is regressed on the structure of imports of finished goods and the structure of imports of intermediates of the firm's competitors, i.e. firms that belong to the same 4-digit industry. The regression controls for firm-fixed effects.[9] Hence, I capture the impact of within-firm variations over the sample period (1986-1992) of the import competition measures on various economic variables.

Results in the first column show that more intense import competition deteriorates the size of the quasi-rent (per worker) that the workers and the firm will have to divide if they bargain. Interestingly, results in the next two columns show that import competition matters for relatively large firms (above 50 employees) and does not have an impact on smaller firms where quasi-rents appear to be smaller (see the coefficient on the constant).

Now, we may ask whether import competition also affects firms' employment or not. The next columns of the same table help answer this question. And the simple answer is "not much". At least not much for the large firms but the smaller firms are adversely affected by more intense import competition (see the next two columns). And, in line with these last results, labor costs per employee are negatively impacted by import competition in the smaller firms, and much less in the larger firms.

In Table 2, I introduce firms' import behavior rather than competitors' behavior. Now,

[6] Because the initial data sources are virtually exhaustive (since they are of administrative origins), most firms within each 4-digit industry are small and do not import. The resulting distributions are therefore very skewed. To reflect the amount of imports in any given industry, one needs to use the 95th or the 99th percentiles of these distributions (see Biscourp and Kramarz, 2004 who give a full description all these facts).

[7] Black and Brainerd (2004) has a somewhat similar setting but their focus is inequality.and discrimination.

[8] The observations are individuals matched to their firm. Larger firms have more individual observations, in proportion to their size. Hence, these regressions are identical to doing firm level regressions weighted by employment.

[9] Most regressions discussed in the following paragraphs include firm fixed effects. If firm effects are not included, this will be explicitly mentioned in the text.

when an industry increases outsourcing (as measured in Table 1), then it is a manifestation that a potentially large share of firms have outsourced part of their production. Indeed, results show that firms, and almost exclusively large firms, that have increased outsourcing also have decreased quasi-rents. In addition, results are exactly equivalent for employment: large firms with increased outsourcing also have decreased employment. This is not so for the smaller firms. As a test of robustness, the joint inclusion of the import competition variables and the firms' import variables does not alter this last conclusion. Smaller firms decreased employment when import competition is intense whereas larger firms have decreased employment when their own outsourcing has increased. In addition, results in the last column of Table 2 show that exports are not associated with movements in employment. Hence, there is something specific to the firms' imports.[10]

These results suggest that rents or profits, employment, and wages are all associated with variations in international trade competition as measured by imports of potential competitors.[11] Furthermore, outsourcing is a strategy used by large firms, for reasons that appear to be specific to them.

All these facts appear to be consistent with the story presented at the beginning of this section. The precise mechanism will be formally presented, estimated, and tested in the remaining sections. The bargaining framework that I introduce in the next section is particularly well-suited to thinking about such a mechanism.

3. Wages and Imports: A Simple Bargaining Framework

In a purely competitive framework, imports at the firm level and, in fact, any firm level variable should not affect wages. In this competitive world, imports' significance in an individual level wage regression should reflect unobserved heterogeneity in workers skills. Therefore, to rationalize a potential **causal** impact of import competition on wages' differences across firms, I use a non-competitive framework.

As was shown by Abowd and Lemieux (1993), product market competition and wage bargaining are intimately related through the financial situation of the firm, as measured for example by rents. Because import competition affects quasi-rents, a natural route for

[10] I tried to use the language of association rather than causality up to here. Obviously, the import decision of the firm is endogenous in all these regressions. This problem, as well as other econometric problems, will be addressed in the next sections.

[11] Note that value added equals revenue minus materials. The quasi-rent is computed by subtracting the opportunity cost of labor from value added. And profit is obtained by subtracting the rent to labor from the latter.

imports to affect bargaining is therefore through changes in the quasi-rent induced by increased pressure of foreign competitors as well as home competitors outsourcing part of their production. And evidence that I have just presented appears to support this claim. There may also be **additional** routes for imports to affect bargaining on top of this ability to pay, as measured by the quasi-rent. These routes are detailed below. In the remainder of this section, I briefly present a simplified representation of the bargaining process that takes place between a union and a firm using an extension of the classic bargaining model (Mc Donald and Solow, 1981, Brown and Ashenfelter, 1986) derived from Coles and Hildreth (2000).

The model that I use relies on the so-called strongly efficient bargaining, where workers and firms bargain over employment and wages,[12] because French institutions, as embedded in the French Labor Laws, appear to favor annual discussion of many issues including wages, hours of work, working conditions, and employment between the firm and the workers' delegates or workers' union representatives.[13]

In the strongly efficient bargaining framework, the union is rent-maximizing with objective function wl where w denotes workers' wage and l denotes the firm's employment (in France, all workers employed in the firm are represented by the unions or the personnel representatives). These representatives negotiate with a profit-maximizing firm with profit denoted by π. The bargaining is over wages and employment. The threat points for the unions and for the firm are respectively $w_0 l$ and π_0.

To summarize, the Nash solution (w_N, l_N) to the bargaining problem solves the following equation:

$$\begin{aligned} (w_N, l_N) &= \arg\max_{w,l}\{(1-\theta)\ln[\pi-\pi_0] + \theta\ln[(w-w_0)l]\} \\ \text{subject to } \pi &= pf(I,l) - wl - p_I I \end{aligned} \tag{3.1}$$

where θ represents the workers' bargaining power, I denotes firm's imports purchased at price p_I, $f(I,l)$ denotes the firm's production function, and p denotes the price of output.

Threat points: Because the threat points are central to my problem, I discuss their exact interpretation now. First, notice that π_0 has often been set to 0 in previous empirical research (Abowd and Lemieux (1993), for instance). Malcomson (1997) suggests that π_0

[12] Rather than the right-to-manage model, where negotiation is restricted to wages.
[13] I present direct evidence on this exact issue in the final Sections.

should measure the profits when the negotiations are inconclusive due to a delay or a breakdown. Hence, it should reflect market alternatives and pressures. In particular, the firm threat point may potentially vary with imports of competitors since they capture effective trade competition. This idea is explicitly incorporated in various theoretical papers relating trade and wages. Mezzetti and Dinopoulos (1991) or more recently Gaston (1998) among others explicitly interpret π_0 as the value of the option to switch production abroad. "That is, π_0 varies positively with a credible outsourcing alternative for the firm" (Gaston, 1998) Furthermore, "During any dispute, the domestic firm supplies the market from abroad" (id.). However, these papers provide no formal proof of these intuitions. This justification is in fact given by Coles and Hildreth (2000) in a context where inventories are used as a strategic threat.

Coles and Hildreth (2000) show that, in an infinite horizon bargaining game between a firm and a union with random alternating wage offers, inventories held by the firm during the negotiation process play a central strategic role. Furthermore, they show (Theorem 1, page 278) that their (dynamic) problem can be rewritten as a Nash bargaining problem in which the firm's expected discounted profits, using the optimal sales strategy should the strike never end, is exactly π_0. After identifying the optimal sales strategy during the strike, they demonstrate that inventories are used as a threat to "force lower wages" (Theorem 3, page 280).[14]

Imports of finished goods in my approach play the same role as inventories in Coles and Hildreth's. Outsourcing is obviously a way to externalize the building of inventories. This strategy is all the more effective since imports of finished goods are most often programmed in advance. For instance, in the clothing industry in France (and more generally in Europe), all sourcing strategies that involve delocalization of the production process imply defining the product at least one year before selling it.[15] Competing strategies are more short-term and allow the firm to produce locally in the so-called Sentier area, within Paris i.e. close to the customers. However, such strategies are almost exclusively used for restocking of small quantities based on the most recent information (Zara, a leading European clothing company, is another example of a firm using this constant restocking strategy). Because outsourced production has been put in place before bargaining, firms

[14] In addition, they show that, because the firm's threatpoint increases faster than expected discounted revenues in inventories, wages are decreasing in inventories (Theorem 3, id.). Finally, they use this model to evaluate empirically changes in bargaining institutions in the UK.

[15] See the discussions in Linge (1991) or Sadler (1994) for examples of other industries.

are able to use a sales strategy that does not rely on local workers (or at least on all local workers, a fraction of them may still be available for certain tasks in the French bargaining institutions). Such strategies can obviously be implemented in various manufacturing industries through either foreign direct investments (FDI) or by using producers in relatively low-wage countries.

I follow Coles and Hildreth in that I do not specify the exact mechanism that helps the firm build its "inventories of imports". I just adapt their results to my problem. And, based on their results, I follow the rest of the literature in posing my problem in the form of a Nash bargaining problem in which the firm's and the workers' threat point potentially depend on the sourcing strategies.

These imports enter the production process in an unspecified way. Consistent with the Coles and Hildreth' theoretical results, I model the firm's threatpoint, $\pi_0(I)$, as a function of imports.

Similarly, w_0 may well depend on imports too. One way is via competitors' imports by decreasing demand for workers. Conversely, firm's own imports may actually offset somewhat this negative effect because firms need workers to complete the production process in the presence of imports (through quality-control, packing,...). [16] In fact, there is even scope for hold-up (see Malcomson, 1997) in this situation.

The bargaining problem (3.1) is solved as usual. At the solution, the marginal product of labor is given by

$$pf_l'(I,l) = w_0,$$

explaining why the bargaining is called "strongly efficient". And, the resulting wage is given by

$$w = w_0 + \frac{\theta}{1-\theta}\frac{\pi - \pi_0(I)}{l}$$

or, equivalently,

$$w = w_0 + \theta\frac{\pi^0 - \pi_0(I)}{l}, \tag{3.2}$$

[16] Notice that French institutions allow some workers to continue working during negotiations and even during strikes. These strikes are rarely coordinated with bargaining rounds since the latter take place annually in firms with at least 50 employees and, in contrast with US institutions may take place even when the firm and the unions are not bargaining.

where π^0 denotes the profit when the wage is evaluated at w_0:

$$\pi^0 = pf(I, l) - w_0 l - p_I I.$$

It will be useful to further decompose w_0 into two components, one related to observed and unobserved personal characteristics and another related to imports. The unconditional opportunity cost of time, which only depends on workers' characteristics, is denoted w^a. The second component is denoted $w_0(I, \overline{I})$, and as argued just above, will comprise those elements that are directly related to imports and in particular includes a component that depends on the amount of outsourcing in the industry, $\overline{I}$. Therefore $w_0 = w^a + w_0(I, \overline{I})$. Equation (3.2) can be written as

$$w = w^a + \theta \frac{\pi^a - \pi_0(I)}{l} + (1 - \theta) w_0(I, \overline{I}) \tag{3.3}$$

where π^a is the quasi-rent evaluated at worker's alternative wage, w^a:

$$\pi^a = pf(I, l) - w^a l - p_I I$$

Notice that employment is set so that the marginal product of labor equals w_0.

In summary, we now have a structural model of wage determination, with workers sharing rents with their employing firms. Of course, rents are potentially affected by competition. Unions may resist competitive pressures. Hence, firms may also act in order to alter their threatpoint through outsourcing abroad. This outsourcing takes place before entering in the negotiation phase, so I is predetermined. Outsourcing acts as a deterrent in the bargaining process because the outsourced goods can be sold while negotiating with the unions. This model has clear game-theoretic foundations (Coles and Hildreth, 2000). And, I show in the remaining sections that it has strong empirical support.

4. Empirical Implementation

4.1. Measurement of the variables in the estimating equation

To estimate a version of equation (3.3), several measurement problems have to be solved.

4.1.1. Data on workers' wages, and their firm's imports and other economic outcomes

The estimating equation relates a worker's wage to her employing firm's imports, quasi-rent, ... Obviously, employee-level data sources and firm-level data sources must be simultaneously accessible. And the individual-level source must contain the employer's

identifier. Indeed, I use data from 5 different ongoing administrative data sources or statistical surveys that allow me to match workers to firms.[17] The first of these data sources is an administrative file based on mandatory declarations of all trade in goods. They are available for all years from 1986 to 1992. The second source is the BAL-SUSE file which includes all firms that are subject to the declaration of the fiscal report called the Bénéfices Industriels et Commerciaux (BIC). All sectors, except the public sector, are covered. Data are available for the period 1984-1992. Our third source is the DADS (Déclarations Annuelles de Données Sociales), which is an administrative file based on mandatory reports of employees' earnings by French employers to the Fiscal administration. Hence, it matches information on workers and on their employing firm. This dataset is longitudinal and covers the period 1976-1996 for all workers employed in the private and semi-public sector and born in October of an even year. Finally, for all workers born in the first four days of October of an even year, information from the EDP (Echantillon Démographique Permanent) is also available. The EDP comprises education and demographic information. These sources are described in more detail in Appendix A.

4.1.2. Measuring workers' opportunity wage and firms' quasi-rent

To directly measure each worker's opportunity wage, w^a, I use the following strategy. Consider the following basic statistical model

$$\ln w_{it} = x_{it}\beta + \alpha_i + \psi_{\mathrm{J}(i,t)} + \varepsilon_{it} \tag{4.1}$$

in which w_{it} is the measured annualized earnings for the individual $i = 1, \ldots, N$ at date $t = 1, \ldots T$; x_{it} is a vector of P time-varying exogenous characteristics of individual i; α_i is a pure person effect; $\psi_{\mathrm{J}(i,t)}$ is a pure firm effect for the firm $\mathrm{J}(i,t)$ at which worker i is employed at date t, and ε_{it} is a statistical residual. Assume that a simple random sample of N individuals is observed for T years. Identification and estimation of this type of equation is discussed at length in Abowd, Kramarz, and Margolis (1999) as well as in Abowd, Creecy, and Kramarz (2002). In the latter, the full least-squares solution is implemented. These papers show that estimation of the person and firm-effects require very large data sets and a sufficient number of years for the person-effects to be precisely estimated. So, I estimate the previous equation using the full DADS data set (13 millions

[17] These surveys were conducted by the Institut National de la Statistique et des Etudes Economiques (INSEE, the French national statistical agency), by the Ministry of Labor, or by the Customs.

observations for the period 1976-1996). The external (opportunity) wage rate for person i is the expected value of her wage conditional on her characteristics and identity, i.e. not knowing the employer's identity. The above equation gives a measure of this external (opportunity) wage rate, defined as $w_{it}^a = E\left(w_{it}\,|x_{it}, i\,\right)$.[18] Hence:

$$\ln w_{it}^a \approx x_{it}\beta + \alpha_i \tag{4.2}$$

This is w^a, the first component of w_0.

The second component measuring the worker's threat point is directly related to the declining employment opportunities in the worker's industry due to import substitution away from the labor input. It is captured by using various statistics on the firm's own imports, on imports of the firm's competitors, and on imports of the wholesale or retail trade industry. More precisely, for each firm, I compute a ratio of imports of intermediates over local purchases and a ratio of imports of finished goods over total production. As described previously, I use the 99th percentiles of the distributions of these statistics **within** each manufacturing industry.[19] I also compute total imports of intermediates and total imports of finished goods for each manufacturing industry. Finally, I compute total imports of each good by trade firms (using the industry classification of the importing firm). Hence, any particular imported good that might affect directly a firm's competitive environment is accounted for. However, because of the lack of adequate data, I cannot keep track of the behavior of those firm's suppliers that do not belong to the firm's industry.

To measure the firm's quasi-rent, I use the following strategy. First, remember that $\pi^a = pf(I,l) - w^a l - p_I(I)$. Assuming for simplicity that all workers have the same alternative wage w^a, we see that $w = w^a \times \exp\psi \times \exp\varepsilon$ (using both 4.1 and 4.2). Hence,

$$\pi^a = pf(I,l) - E[\frac{w}{\exp\psi \times \exp\varepsilon} l] - p_I(I)$$

where E denotes the expectation taken in the firm of the relevant random variable. Now, note first that the firm effect is constant in the firm. Then, by the same reasoning as

[18] Notice that $\ln w_{it}^a = \ln E\left(w_{it}\,|x_{it}, i\,\right) = (x_{it}\beta + \alpha_i) + \ln E(\exp(\psi_{\mathrm{J}(i,t)} + \varepsilon_{it}\,|x_{it}, i\,)$. Then, because the pure firm effect $\psi_{\mathrm{J}(i,t)}$ and ε both have mean 0, and variance σ_ψ^2 and σ_ε^2 respectively, we have $E[\exp(\psi + \varepsilon)] = \exp\frac{\sigma_\psi^2 + \sigma_\varepsilon^2}{2} \approx 1$, assuming that both ψ and ε are normal as they appear to be, and because σ_ψ^2 and σ_ε^2 are small (0.08 and 0.04 respectively, for all these results see Abowd, Creecy, and Kramarz, 2002) and can be taken as independent of the person observed or unobserved characteristics.

[19] To assess robustness of my results, I also compute the 90th and the 95th percentiles of these distributions. As mentioned previously, the use of such extreme percentiles is justified by the extreme skewness of the distribution. The median, for instance, is almost always zero.

above, the equation can be rewritten as:[20]

$$\pi^a = pf(I,l) - \frac{wl}{\exp\psi} - p_I(I) \tag{4.3}$$

Therefore, the quasi-rent π^a uses a measure of labor costs, $\frac{wl}{\exp\psi}$, that eliminates the costs due to the pure firm-effects. All these elements are measured directly.

4.2. The resulting estimating equation

The above discussion has consequences for the specification of the estimating equation. Let us recall that we start from (3.3):

$$w = w^a + \theta\frac{\pi^a - \pi_0(I)}{l} + (1-\theta)w_0(I,\overline{I})$$

Appendix B explains how to go from this aggregate equation to a person-level specification that includes person-level characteristics as well as firm-level characteristics. Using previous relations, and introducing the relevant indices, we have

$$\begin{aligned} w_{it}(x_{it}) &= \exp(x_{it}\beta + \alpha_i) + \theta_{\mathrm{J}(i,t)}(x_{it})\frac{\pi^a_{\mathrm{J}(i,t)t}}{l_{\mathrm{J}(i,t)}(x_{it})} - \theta_{\mathrm{J}(i,t)}(x_{it})\frac{\pi_{\mathrm{J}(i,t)t0}(I_{\mathrm{J}(i,t)t})}{l_{\mathrm{J}(i,t)}(x_{it})} \\ &\quad + (1-\theta_{\mathrm{J}(i,t)}(x_{it}))w_{it0}(I_{\mathrm{J}(i,t)t},\overline{I}_{\mathrm{J}(i,t)t}) + \xi_{it} \end{aligned} \tag{4.4}$$

where i denotes the worker, t denotes time, and $\mathrm{J}(i,t)$ denotes the firm at which i is employed at date t. Furthermore, α_i is estimated using equation (4.1), $\pi^a_{\mathrm{J}(i,t)t}$ is directly measured using equation (4.3). $\theta_{\mathrm{J}(i,t)}(x_{it})$ denotes the bargaining power of worker i with characteristics x_{it} employed in firm $\mathrm{J}(i,t)$, and $l_{\mathrm{J}(i,t)}(x_{it})$ denotes the firm's labor demand for workers with characteristics x_{it}. Since $\frac{\pi_{\mathrm{J}(i,t)t0}(I_{jt})}{l_{\mathrm{J}(i,t)}(x_{it})}$ and $w_{it0}(I_{\mathrm{J}(i,t)t},\overline{I}_{\mathrm{J}(i,t)t})$ are not observed, I replace them with functions of the firm's imports and of imports of the firm's competitors, respectively. A final note is in order. This equation is expressed in levels and will be estimated in levels in contrast to most of the literature (a recent exception is Margolis and Salvanes, 2002).

Finally, it is important to note that equation (4.4) expressed in levels is compatible with equation (4.1) expressed in logarithms.[21]

[20] Assuming that ε is normal with mean 0, and variance σ^2_ε, we have $E[\exp\varepsilon] = \exp\frac{\sigma^2_\varepsilon}{2} \approx 1$, since σ^2_ε is small (0.04, see Abowd, Creecy, and Kramarz, 2002) and is independent of the person and the firm observed or unobserved characteristics, as derived previously.

[21] Starting from equation (4.1), then taking its exponent and rewriting it using a Taylor expansion yields the following:

4.3. Endogeneity and other potential econometric problems

Apart from measurement problems, discussed in the previous subsection, Abowd and Lemieux (1993) point to multiple potential econometric pitfalls in estimating equation (3.3):

(i) When the splitting parameter θ varies by firm, and when this parameter is correlated with the size of the quasi-rent, estimates of θ will be biased upward (downward) if this correlation is positive (resp. negative).

(ii) When the contract is not strongly efficient, then wages, quasi-rent, and employment are determined jointly. This standard endogeneity bias makes OLS estimates inconsistent. Abowd and Lemieux (1993) as well as Abowd and Kramarz (1993) show that proper estimates of (4.4), using instrumental variables, yield a lower bound for the bargaining parameter when the contract is not strongly efficient (see the discussion in Abowd and Lemieux from page 988 to page 990).

In all cases, in order to identify the bargaining parameter θ, movements reflecting changes in product market competition should translate into movements of the quasi-rent. To understand the issue, consider simplified versions of the first-order conditions with no imports:

$$\begin{aligned} pf'(l) &= w^a \\ w &= w^a + \frac{\theta}{l}\pi^a \end{aligned}$$

Now, in contrast to Abowd and Lemieux (1993), assume that markets for goods are not fully competitive and that $p = D^{-1/c}$ where D denotes demand and η is the elasticity. Assume in addition that $f(l) = A_1 l^{\alpha}$, i.e. the production function is Cobb-Douglas. Then, the revenue function $R = pf(l) = Al^{\frac{\alpha}{\mu}}$ where $\mu = \frac{\eta}{\eta - 1}$. Therefore,

$$pf'(l) = \frac{\alpha}{\mu}\frac{R}{l} = w^a$$

$$\begin{aligned} w_{it}(x_{it}, \alpha_i, \psi_{\mathrm{J}(i,t)}, \varepsilon_{it}) &\simeq \exp(x_{it}\beta + \alpha_i)(1 + \psi_{\mathrm{J}(i,t)} + \frac{{\psi_{\mathrm{J}(i,t)}}^2}{2})(1 + \varepsilon_{it} + \frac{{\varepsilon_{it}}^2}{2}) \\ &\simeq \exp(x_{it}\beta + \alpha_i) + \exp(x_{it}\beta + \alpha_i) \times [\psi_{\mathrm{J}(i,t)} + \frac{{\psi_{\mathrm{J}(i,t)}}^2}{2} \\ &\quad + \varepsilon_{it} \times \psi_{\mathrm{J}(i,t)} + \varepsilon_{it} \times \frac{{\psi_{\mathrm{J}(i,t)}}^2}{2}] \\ &\simeq \exp(x_{it}\beta + \alpha_i) + f(x_{it}, i, \mathrm{J}(i,t), \varepsilon_{it}) \end{aligned}$$

Therefore, we see that these equations are indeed compatible.

The wage equation becomes:

$$w = w^a + \frac{\theta}{l}\pi^a = (1-\theta)w^a + \frac{R}{l}\theta$$

and, from the first-order condition

$$\frac{R}{l} = \frac{\mu}{\alpha}w^a$$

From these last two equations, it is easy to see that in the case of perfect competition ($\mu = 1$) movements in competitive pressures do not help identify the bargaining parameter θ. It is also clear that movements in α induced for instance by technical changes, innovation,... are useful (see Van Reenen, 1996 for this approach of the problem). However, if $\mu \neq 1$, and more importantly varies with competitive pressure, it becomes possible to identify θ. Furthermore, from this simple model, we see how endogeneity and measurement error in the opportunity wage will affect the estimates.

Rewrite w^a as $w^a = \widetilde{w}^a + e^w$ in which the real opportunity wage is approximated because of aggregation problems, measurement error, unobserved components inducing unobserved heterogeneity. Then, the above equations rewrite as

$$\begin{aligned} w &= (1-\theta_j)\widetilde{w}^a + \frac{R_{jt}}{L_{jt}}\theta_j + e^w(1-\theta_j) \\ \frac{R}{l} &= \frac{\mu}{\alpha}\widetilde{w}^a + \frac{\mu}{\alpha}e^w \end{aligned}$$

From these equations, endogeneity problems are very clear. The revenue per worker or the quasi-rent per worker is correlated with the residuals e^w. But, note also that a strategy where I get a direct estimate of the worker's opportunity wage w^a eliminates all such problems **if** this alternative wage is well-measured, i.e. $e^w \simeq 0$. The use of individual level data sources matched with firm level data allows the analyst to decompose the wage into person effects, including the contribution of observables, and firm effects, producing a good measure of the opportunity wage. If the measure of the workers' opportunity wage is precise enough, the quasi-rent would not be endogenous in a **person-level** wage equation.

A final problem is worth mentioning. The equation is estimated using person-level observations. But, since we follow the worker in the firm and from firm to firm, we can measure precisely seniority in the firm. And, as shown in our descriptive section and also pointed out in Goldberg and Tracy (2001), the impact of competition may well fall on workers through employment losses and increased mobility. Hence, seniority is potentially endogenous in the above equation. And, indeed, a large part of the effects of increased

competition due to globalization of the product markets are likely to be channeled through this variable (see the discussions in Farber, 1999, on instability in the United States). And, even if seniority were not included in the wage regression, movements in and out of manufacturing firms during the sample period might be related to import competition.

The above discussion shows that an empirical strategy has to be set-up **if** the quasi-rent is found to be endogenous despite all measurement efforts. I follow the literature in using instrumental variables. These instruments should be correlated with the quasi-rent, seniority, and other endogenous variables such as imports. In line with Abowd and Lemieux (1993), Abowd and Allain (1996), and Bertrand (2004), I must find measures of exogenous demand shocks affecting product market competition.

4.4. Instruments: Export Prices of US Firms to Measure French Demand Shocks

Valid instruments must reflect changes in product market conditions inducing movements in the quasi-rent through μ, or in the import decisions of the firms, but they must be uncorrelated with the error terms in the wage equation. In particular, such instruments should not be correlated with e^w.

Product market conditions are determined by local conditions as well as by global factors. Many among these local factors can be affected by the local firms' behavior. But, most often, the global factors are beyond the reach of the French firms that I examine. Among these global factors, exchange rates naturally come to the mind. Economic conditions and productivity shocks that take place in any countries that trade in the World market are likely to affect many local decisions of the French firms. For instance, a positive productivity shock in the textile industries of some Asian economies might affect outsourcing decisions of French firms, hence their imports and their employment. An increase in the price of oil might have an impact on the ability to consume and to import of Middle Eastern countries. A positive productivity shock in the American steel industry willl affect negatively the French steel producers but they will affect positively the French automobile industry, a heavy user of steel. These shocks in different countries will have a differentiated impact on the different firms depending in particular on their exposures to these various global markets since some export whereas some do not, some import whereas some do not, some are global competitors whereas some are not.

Based on the preceding discussion, I use international market prices, in US Dollars,

to instrument both firm- and person-level variables. More precisely I use industry-specific export prices of United-States manufacturing firms in four destinations. These variables meet the various requirements presented above. Because they are export prices, they are determined on the world market and are therefore beyond reach of French producers. In addition, because they are export prices as set by US firms, they reflect world competition as perceived by a large player. Furthermore, as these price indices are in fact unit value indices computed in US dollars, they also reflect exogenous variations in the exchange rate of the US dollar vis à vis different destination countries. These prices are measured at the 3-digit industry level. Therefore, I should be able to capture multiple variations, affecting differently firms according to their specific exposures to the various markets.

Abowd and Lemieux (1993) used ideas related to this procedure when studying Canadian firms, Abowd and Allain (1996) also used a similar idea when instrumenting French firms' quasi-rents, Bertrand (2004) used a related strategy when instrumenting industry-level import penetration ratios by source-weighted industry exchange rates, and Gourinchas (1999) shows how exchange rates affect job flows. Here, the procedure is extended in three directions. First, I apply this instrumentation idea to all firm-level variables, in particular quasi-rents and imports. Second, I use detailed export prices, expressed in dollar terms, for four different destinations that result from the equilibrium induced by US manufacturing firms when exporting to different regions of the world.[22] Third, I instrument seniority since individual's mobility is potentially affected by the firm's exposure to competition.

I now present evidence that these export prices represent pure demand shocks. To do this, I exactly follow Abowd and Lemieux (1993) in estimating a supply equation. Hence, I regress the sales of French firms on industry-level ouput prices and industry-level wages. First, I estimate the relation between firm-level sales (deflated by industry-level output prices) and industry-level value-added prices, industry-level wages and time indicators in the cross-section dimension. Then, I control for firm fixed effects. Finally, I instrument value-added prices using lagged US export prices (from 1981 to 1986, when my estimation period is 1986 to 1992). The results are presented in Table C.1. In column 1, the relation between industry-level prices is estimated by OLS. The least squares estimate is negative reflecting the fact that, in the cross-section, supply shocks dominate demand shocks. However, when firm fixed effects are introduced the coefficient becomes

[22] Abowd and Allain (1996) used a unique aggregate destination.

positive and is marginally significant (column 2). Finally, when value-added prices are instrumented by US export prices the relation becomes strongly positive (column 3).[23] The elasticity is equal to 0.458, slightly above the one estimated by Abowd and Lemieux for Canada whereas the impact of wage on sales is very comparable to theirs. One can conclude from this exercise that past variations in US export prices reflect demand shocks affecting French firms. These prices allow me to estimate valid supply equations: when prices go up, production increases. Hence, there are good economic reasons to believe that such instruments are well-suited to the present needs of my statistical analysis. More evidence is presented below.

5. Estimation Results

Table 3 presents the OLS results for equation (4.4). To summarize the main findings, firm's quasi-rent and worker's seniority are shown to be endogenous in the worker's wage equation. Hence, I need to use instrumental variables to estimate the bargaining model. In order to focus on the main messages of the paper, I have relegated the full discussion of Table 3 in Appendix C.

However, several points are in order. First, all my regressions control for person-specific unobserved heterogeneity using the estimated person effect (see Appendix C for details). Second, I tested for endogeneity of the main variables of my wage model: firm-level quasi-rent, firm-level imports of goods (as a fraction of production), firm-level imports of intermediates (as a fraction of local purchases), the competitors import behavior (the 99th percentile of the distribution of imports of goods as a fraction of production in the same 4-digit sector and the 99th percentile of the distribution of imports of intermediates as a fraction of local purchases in the same 4-digit sector), worker's seniority, and seniority-square (see again Appendix C for details). All variables **but** quasi-rent and seniority are exogenous in this person-level wage equation. Third, the instrumenting equations appear to be sensible and statistical tests validate the instruments (see Appendix C for details and Appendix Tables C.2 and C.3 for a summary of the results).

[23] The estimation is done in first difference as in Abowd and Lemieux (1993).

5.1. Firm's trade and competition matter

Table 4 presents the estimates of the bargaining equation (4.4) where quasi-rent and seniority are both instrumented.[24] As before, there are two columns, using my two measures of the quasi-rent. For each estimate, I provide two sets of standard errors. Robust standard errors are given between parentheses. Standard errors that account for clustering at the 3-digit industry level are given between brackets. Quasi-rent, seniority and its square are instrumented using my measures of product market conditions - export prices (industry-level unit values measured in US dollars of American firms to 4 destinations) - and the other control variables.

Competition enters through at least two routes in the estimated equation. First, competition affects the size of the quasi-rent. Hence, the magnitude of sharing of this quasi-rent between workers and the firm is central in the way the competitive pressure affects workers' wages. Second, firms's trade and competitors' import behavior directly affect wages. We study the two routes in turn.

Shocks in the competitive environment affect the size of the quasi-rent, as shown in Section 2. Table 4 shows that workers receive a 20% share of this quasi-rent. Hence, because the quasi-rent decreases when competition increases, workers' wages are negatively affected. This bargaining coefficient obtained from IV estimates is quite similar to that obtained using OLS. This estimate of the bargaining parameter, 0.20, is roughly half that obtained for France by Abowd and Allain (1996) and Abowd and Kramarz (1993) using firm-level equations or those obtained for Canada by Abowd and Lemieux (1993). But the parameter is much larger than that obtained by Blanchflower, Oswald, and Sanfey (1996) who use a logarithmic specification.[25]

I turn now to the second route through which competition affects wages. Coefficients on the firm's own imports variables should tell us how wages are affected by trade, through the effects of the firm and the worker outside options. Coefficients on the "competitors" variables should tell us how workers' outside options are affected when foreign trade is active in the industry, either because firms outsource their production themselves or because

[24] The concern for the weak instruments bias (see Bound, Jaeger, and Baker, 1995 and Staiger and Stock, 1997) leads me to present in Table 4 the F-statistics that tests the nullity of the instruments in the first-stage regressions. These values are large, suggesting that there is no weak instruments problem. The Sargan statistics (distributed as a chi-square with appropriate degrees of freedom) that tests the statistical validity of the instruments is reported in each of the following tables.

[25] In an unreported regression, a logarithmic specification of (4.4) yields estimates that are in the same ballpark as those found by Blanchflower et al. (1996). I therefore believe that the low estimates of workers' bargaining power comes from this difference in specification of the equation of interest.

wholesale or retail trade firms import foreign goods.[26] I include two types of "competitors" variables: levels should capture growth in the industry whereas the shares should capture substitution between local and foreign production. Notice that the resulting estimates "within-industry" since I control for 3-digit industry indicators (my competition measures are time-varying). Results of this table can be summarized as follows:

- The firm's trade matters. Workers employed by a manufacturing firm that imports are better compensated than those who are employed in a non-importing manufacturing firm.

- Competition matters. Workers employed in industries where firms outsource a large share of their production are negatively affected. Imports of intermediates by competitors has a positive impact on workers' wages.

Discussion and interpretations of these two results will be presented in the final subsection of this section.

- The total of the two effects for **outsourcing** is **negative** for most workers employed in the manufacturing industries. More precisely, 50 percent (resp. 75 percent) of workers are employed in firms that import less than a thousandth (a hundredth) of their production. The average 99th centile of this ratio being equal to 0.4, workers lose around 1,600 French Francs from "import of goods" competition in the average industry and 50 percent (resp. 75 percent) of workers gain at most 30 French Francs (resp. 300 French Francs) from the firm's imports.

- Competition from the trade industry – trade firms importing goods in the same 3-digit industry as the firm's – does not seem to affect workers' compensation very strongly, and if an effect is present, it is positive.

- Bargaining matters and the size of the quasi-rent affects workers' wages. Competitive pressures decrease the quasi-rent.

5.2. The returns to seniority and the selection of the "best"

Returns to seniority in France are small (see Abowd, Kramarz, and Margolis, 1999, among others, who show that, allowing for heterogeneity across firms, average returns to seniority

[26] Since I know the 3-digit good imported by these trade firms, I can relate this good to the industry of the firm and therefore measure the total value of goods imported by trade firms in each 3-digit industry, for each year of my sample period.

are roughly equal to zero in France, with many firms having negative returns). OLS results presented in Table 3 confirm this finding. But, examination of the seniority coefficients presented in Table 4 shows that they are much larger (more negative) in the IV estimates than in the OLS version. Are these estimates credible? Equation (4.4) is estimated in levels of annual earnings (thousands of 1980 French Francs). For all levels of seniority below 14 years, returns are decreasing. Wage increases due to pure seniority effects start at 14 years and those increases then go up with seniority (5,000 Francs at 18 years for instance). Should we believe that returns to seniority are decreasing in France for as long as 14 years despite the fact that returns to experience accumulate during this time ? Three answers can be provided at this point. First, the estimates are not very precise. Second, and more importantly, returns to experience are increasing, in particular during the first years of labor market experience. The total effect – experience plus seniority – is increasing for most of the population slightly less so for those with a wage close to the minimum wage. For those workers, even though compensation may stay quite close to the minimum wage, the SMIC, for long periods of time, there are some mandated real increases. Hence, the compensation profile of these persons should be flatter than for the rest of the population. By way of consequence, if wages increase because of accumulated experience, returns to seniority should adjust to generate this observed flatness. This result is confirmed by Abowd, Kramarz, and Margolis (1999) . Second, and directly related to my model, these returns, although imprecisely estimated, give us evidence on the selection process operating in manufacturing firms that face import competition. Not controlling for selection, returns are essentially zero. Hence, workers who remain in the firm are obviously the "best" workers, i.e. those with the largest wage growth. In particular, firms appear to have fired minimum wage workers for whom wage growth is equal to minimum wage growth as is confirmed by independent evidence (see Kramarz and Philippon, 2001).

5.3. Robustness checks

Table 5 presents robustness results. I use the two measures of the quasi-rent and other measures of competition based on the 90th and the 95th percentiles of imports in the industry. Results are very similar to those described in Table 5. In unreported results, to further test robustness of my estimates, I estimate equation (4.4) where, in addition to the estimated person effect interacted with the various person characteristics, I introduce a dummy for each person (a person fixed-effect). Notice that, as forcefully shown in

Abowd, Kramarz, and Margolis (1999), this person fixed effect not only captures person heterogeneity but also firm-heterogeneity. Therefore, this should bias the estimates for the firm-level variable in the equation. And, indeed, the estimated returns to seniority are negative and exactly identical to those obtained in Tables 4 and 5. But, the bargaining power θ (the coefficient on the quasi-rent variable) decreases to 0.03 (highly significant). This result is not surprising because this "fixed person-effect" is in fact a person plus the average firm effect of the firms at which the worker was employed. Hence, the coefficient on the quasi-rent is biased (see the formulas in Abowd, Kramarz, and Margolis, 1999).

5.4. Differential effects by worker skills and origins of imports

Since my equation uses worker-level data, I can very easily focus on specific categories of workers. Table 6 presents results for different types of workers. I selected those most likely to be affected by changes in competition. In addition, I present estimates of equation (4.4) where the countries of origin of the imports are distinguished. The first column presents results for the whole population whereas the remaining columns show results for two groups of experience and for the low-education group (high-school dropouts). Four groups of countries of sourcing are contrasted: Europe, other OECD countries, low-wage countries close to France (Maghreb and Eastern Europe countries), low-wage countries far away from France (China, India, NIC, among others). Indeed, the origin of imports matters, even though effects are not precisely estimated. Contrasting European countries with other OECD countries and close low-wage countries with far-away low-wage countries, we see that coefficients on firm's imports is always larger for the latter, other OECD and far-away low-wage countries than for the former. Distance matters. Note though that low-education workers do not benefit from distance. This is particularly striking when compared with the high-education group[27] who benefit more than any other group from imports from far-away low-wage countries or other OECD countries of their employing firm.

5.5. Imports and wages: unobserved heterogeneity or causal effect ?

The positive effect of the firm's own imports on wages: Even though it is not very large for most firms, this positive effect has two potential explanations. In the first, it is

[27] I do not present these results in Table 6 because the price instruments do not seem to be very good for this group, even though I am able to come up with impeccable chi-square statistics. In fact, the first-stage F statistics is too low (around 3). However, the result that I just mentioned is very stable (with different set of instruments or OLS).

just the manifestation of unobserved heterogeneity on the firm side: firms that import are better firms in that they have a higher ability to pay their workers. In the second, the effect is causal and firms pay their workers more because they import. In the bargaining framework, a potential explanation for the positive coefficient is that some workers are in a better negotiating position vis-à-vis their employing **because** their firm imports. In that sense, outsourcing has two effects. First, the rent that is shared between workers and firms is decreased but oursourcing may have induced a hold-up effect. I examine these two explanations in turn.

In all the preceding regressions, I tried to control for unobserved heterogeneity as much as I could. I did this in multiple ways. First, I tested for endogeneity of the various firm-level, industry-level, and match-level regressors. I searched and found intruments, similar in spirit to those used by other analysts of near identical problems. Second, I directly controlled for unobserved person heterogeneity by introducing as an additional regressor the person heterogeneity as estimated in a general wage equation with many more observations, individuals, firms and time periods, the only way to obtain relatively precise estimates of these "nuisance" parameters (see Section 3, equation, 4.1). Still, the positive coefficient of imports in the wage equation could be viewed by the skeptical reader as manifestation of firm-level unobserved heterogeneity, as in the size-wage literature. For instance, it could reflect better management; firms that import having better managers and longer survival in a highly competitive environment. Notice though that my statistical tests of exogeneity show that the firm's own import is not endogenous in this individual-level wage equation. However, and to **directly** address this issue, I took wage equation (4.4) where the quasi-rent and seniority are both instrumented in which I added a direct measure of unobserved firm heterogeneity as estimated using (4.1). Because I have only a few observations per firm, introduction of firm indicator would yield very imprecise estimates and a potentially unconvincing conclusion whereas using the precise estimates of this "nuisance" parameter, the firm fixed-effect, the resulting estimates should tell us if, indeed, imports capture unobserved firm heterogeneity. Results are presented in Table D.1. They are exactly identical to those presented in Table 4 in which there is **no direct** control of firm unobserved heterogeneity. Firm's own imports, a time-varying measure, positively affects individual wages of its employees. So, to summarize, in equation (4.4), and conditional on observed and unobserved person heterogeneity, conditional on the quasi-rent, and even conditional on unobserved firm heterogeneity, imports are exogenous

and movements of imports appear to have a causal impact on wages. The question is the potential mechanism that drives this effect. The next subsection considers the possibility that uions are the mechanism.

The negative effect of competitors' imports of finished goods on wages: The discussion that precedes is also applicable to competitors' imports. And indeed, the results presented in Table D.1 control both for firm unobserved heterogeneity and industry unobserved heterogeneity. I therefore consider these effects to be causal. I now turn to the mechanisms for these effects.

5.6. And what about unions ?

To understand the role of unions in the bargaining process and its connection with trade, I need some measure of union activism at the establishment or firm level. Hence, I match my original file with a survey that gathers information on firm and establishment level bargaining activity, the so-called Enquête Structure des Salaires (ESS, hereafter) for year 1992. This survey collects information on firm or establishment level bargaining under the Lois Auroux. Let me recall that the Lois Auroux stipulate that bargaining must take place every year in an establishment or a firm with at least 50 employees. But, crucial for the analysis, even though bargaining is mandatory, firms can refuse to bargain on some subjects, employment for instance, and firms are not forced to sign an agreement at the end of the bargaining process.[28]

The data tell me if a round of bargaining took place in that year. In addition, I know the topic of the negotiation: wages, employment, other. Finally, for each topic of the negotiation, I know if an agreement was signed in that year. Unfortunately, because the ESS samples establishments using a frame based on establishment or firm size, I lose a fraction of my observations, mostly in smaller units (explaining why I did not use this source for the earlier analysis). The resulting file has 37,698 observations, a third of the original file.

Descriptive statistics show that 26% of workers were employed in a firm where negotiations on employment took place in 1992. For most of them, 82%, an agreement was signed after the negotiation. Virtually all these firms also negotiated wages with their employees. Only 4% of the workers are employed in firms that negotiated on employment without negotiating on wages. Furthermore, 81% of the workers were employed in firms

[28] Even though bargaining is supposedly mandatory, some establishments do no start a round of negotiation every year.

that negotiated on wages; with 65% among them eventually signing an agreement. Even though the different bargaining regimes are not perfectly aligned with the theory, I focus on a limited number of bargaining regimes. Hence, for each individual observation, I classify the employing firm as:

i) bargained with unions (or personnel delegates) on employment;

ii) bargained with unions (or personnel delegates) on wages;

iii) did not bargain with unions or personnel delegates.

In what follows, in line with the efficient bargaining model that I adopted, I mostly constrast firms in the first category with the rest of the firms. Robustness checks confirm that this distinction is the most relevant. To distinguish between firms with heterogeneous bargaining regimes, I estimate a variant of (4.4) in which θ can take two values, θ_b θ_n depending on the bargaining regime:

$$w = w^a + \theta_i \frac{\pi^a - \pi_0(I)}{l} + (1 - \theta_i) w_0(I, \overline{I}) \quad \text{where } i = b, \quad n \tag{5.1}$$

This equation is estimated as before, using the same set of instruments, and the results are presented in Table 7. They tell a clear story. Firms that negotiate on employment with their unions have to share half of their quasi-rents with their workers. In other words, in those firms, unions are strong enough to extract half of the quasi-rent. However, in firms that did not negotiate on employment with their unions, workers bargaining power was essentially zero and workers received their opportunity cost of time, w^a, plus their negotiation threat point, $w_0(I, \overline{I})$. In other words, in firms where unions were too weak to impose negotiations on employment, workers were compensated at the market rate.

In addition, because $\theta_n = 0$ (for those firms that did not bargain on employment), coefficients on the trade variables – the firm's own imports and imports of competitors – give us direct estimates of $w_0(I, \overline{I})$. First, they show that the threat point increases with the firms' own imports of finished goods. Second, workers suffer slightly from competitors' imports of finished goods but the threat point is improved by competitors' imports of intermediates.

Now, for firms in which negotiations on employment took place, hence where $\theta_b = 1/2$, results should be an equal mixture of $\frac{\pi_0(I)}{l}$ and $w_0(I, \overline{I})$ (see 5.1) First, there is no significant impact from firm's own imports. But, the most striking result is the strong and robust negative impact of the firm's competitors imports of finished goods as well as intermediates (albeit slightly less so) on workers' wages. Hence, workers benefit from

the sharing of the rent, even though this quasi-rent appears to be under attack because of increased competition (see Table 1 and Table 2), but import competition strongly decreases wages in firms that negotiated (were forced to) on employment.

Notice that the Lois Auroux, as stated above, force firms with at least 50 employees to negotiate with their workers but the topic is left to the parties. Indeed, most firms negotiate on something. However, not all firms accept to bargain on wages and even less bargain on employment (and wages, in fact). In that respect, because firms must negotiate but need not sign an agreement, signature of an agreement is not necessarily an element of proof of strong unions, as (unreported) results show: in firms that sign an agreement, the bargaining power is $\theta_b = 0.37$.

To complete the story, it is useful to understand why some firms negotiated on employment or wages and why other firms did not. What were the changes that favored these negotiations. To do this, I analyze (using a "multinomial logit" specification) the likelihood of a negotiation on employment, a negotiation on wages alone, or no negotiation conditional on various firm-level observables as measured from their growth rates during the analysis period.

Results are presented in Table 8. They show that firms that agreed to negotiate on employment with their unions had high growth in labor costs per person, lower employment growth, and a higher growth in the quasi-rent over the period (in contrast with those firms that negotiated only on wages, the reference group). On the trade side, these firms increased strikingly more their imports of finished goods than firms that negotiated only on wages (the opposite holds for imports of intermediates). They also faced tougher competition. Hence, firms were potentially willing or forced – there is no way to identify one from the other – to negotiate changes with unions or personnel delegates in their attempts to further reduce employment in this increasingly competitive environment. However, firms improved their bargaining position (threat point) over the period because they increased outsourcing before bargaining, exactly as the model suggests. Hence, these firms appear to have been substituting imports for employment because of increasing unit labor costs and strong unions that forced them to share a very large fraction, $\theta_b = 1/2$, of their quasi-rent. Unions appear to have been able to resist changes mostly because of their very strong bargaining power. Their resistance was associated with increased outsourcing, eventually leading to further declines in their employing firms' employment.

6. Conclusion

In this paper, I present the first direct micro-econometric evidence of the relation between workers' wages, employment and the import behavior of employing firms (see Bertrand, 2004 and Goldberg and Tracy, 2001 for evidence in the United States based on industry-level measures of import competition). The story that I evaluate relates trade competition and firms' wages and employment behavior in an imperfectly competitive labor market where unions and firms have to bargain. To accomplish this task, I first derived wage equations from a bargaining model that allows the analyst to examine the impact of firms' imports on the workers' and firms' bargaining positions. To estimate this model, I have used a unique matched employer-employee data source that contains information on firms' inputs, including imports by type of product and by country of origin, as well as individual characteristics of a representative sample of workers employed at those firms. I estimate the structural person-level equation induced by the bargaining model. In contrast to previous approaches, in particular the various papers by Abowd, endogeneity issues are not only due to the presence of the quasi-rent - a firm-level variable - in the wage equation but from seniority - a person-level variable directly affected by competition and the firm's strategic choices such as importing. Trade has a direct impact on workers' mobility and the associated job loss probability. Of course, the size of the quasi-rent is directly affected by international trade. My results show that the effects of trade go **beyond** movements in the quasi-rent. Estimates show that worker's compensation is directly affected by the firm's import behavior and import competition.

To summarize my results, I find a bargaining power around 0.20, half the power estimated using firm-level equations. I also show that workers' wages deteriorate through competitive pressures. Two effects are at play. In industries where competitors of their employing firm actively import (finished) goods, workers' wage is decreased. But, firm's own imports of these (finished) goods "protect" workers. The total effect is negative for most workers. The impact of import competition on mobility and workers' selection is strong. My results show that manufacturing firms keep their best workers. All these results are robust to the various specification checks that I conducted.

The use of matched employer-employee data sources also allows me to examine specific categories of workers. The situation of highly educated workers who appear to benefit from trade stands in stark contrast with that of less educated workers, in particular those

with only a high-school degree. Also, very experienced workers, when still employed in manufacturing firms, benefit from the positive effect induced by the outsourcing strategy of their employing firm but are those most affected by outsourcing of the firm's competitors and the induced selection effect.

Finally, I delve further into the relationship between the behavior of unions and firms' imports. For firms that bargained on both employment and wages with their workers' unions, my results show that workers captured half of the quasi-rent. Workers in other firms were not able to capture a significant share of the rents. But these results also demonstrate that firms that bargained with their workers over employment and wages have apparently tried to use outsourcing in order to decrease their employment in the face of increasing unit labor costs and strong unions. Unions' resistance appears to backfire.

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Appendix A: Data Description

The Customs File: All movements of traded goods that enter or leave France are declared to the customs either by their owner or by the authorized customs commissioners. These declarations constitute the basis of all French trade statistics. Each movement - an operation - generates a record. All records are aggregated first at the monthly level. In the analysis file, these records are only available on an annual basis. They were aggregated at the firm-level using the firm identification number, the SIREN. Even though, each individual movement is present in the base files, the resulting files are not tractable. Hence, the analysis file contains for all exporting or importing firms and for all years, the amount of their total transactions in each year between 1986 and 1992 for each product of the NAP 100 classification (3-digit equivalent of the SIC code). Transactions are recorded in French Francs and measure the amount paid by the firm (i.e. including discounts, rebates,...). Even though our file is exhaustive - all export or import of goods are present - direct aggregation of all movements differ from published trade statistics, the latter being based on list prices. Furthermore, amounts are disaggregated by destinations for the exports and origins for the imports and by products (at the 3-digit classification level). The geographic classification is the most detailed possible since we know the exact country of origin or destination. In a previous analysis, I aggregated the data up to the following country classification:

(a) Germany (b) Spain, and Portugal (c) United Kingdom, Ireland (d) Italy (e) Benelux (f) Other EC countries (g) Switzerland (h) Eastern Europe countries (i) Turkey (j) Maghreb countries (k) Middle East countries (l) Other African countries (m) United States of America and Canada (n) Other American contries (o) India (p) China (q) Asian "Tigers" (Malaysia, Thailand, Taiwan,...) (r) Japan (s) Other countries. These groups of countries have been further aggregated for this particular study in 4 categories: European Community, Other OECD countries, Low-wage countries close to France (Eastern Europe and Maghreb), Other low-wage countries (referred in the tables as far-away low-wage countries) such as India, China,...

In addition, I define two groups of imported products. I compare the 3-digit industry of the imported good with the 3-digit industry of the importing firm. If they match, I call this import a "good". If not, I call this import an "intermediary consumption" (IC, as already defined).

The original file has 4,159,208 observations for the period 1986-1992. An observation contains the firm identifier, the year, the transaction value, the product, the origin or the destination. However, I do not know the price of the transaction. To deflate our measures of firm-level trade, I use 4-digit import and export prices computed for three geographic zones (EC, OECD outside EC, outside OECD) by the statisticians from the French National Accounts.

OECD export prices: I also use export prices of US manufacturing firms. These price indices are based on OECD computations based on US customs declarations. They are unitary values indices computed as a weighted average of the ratio of either transaction values or list values to quantities declared by American exporters. All these values are expressed in US dollars. These indices were aggregated at INSEE from the CTCI classification to the 3-digit level used in the French NAP (nomenclature d'activités et de produits, 1973) and are available for four destinations: developed countries including in particular OECD countries; countries from eastern Europe; countries from OPEC; and developing countries. These series are available for the years

1961 to 1992 even though I will restrict to the years 1981 to 1986 (INSEE, 1993).

BAL-SUSE: The BAL-SUSE database is constructed from the mandatory reports of French firms to the fiscal administration. These reports are then transmitted to INSEE where controls and confrontation with various other data sources (such as the EAE, Enquête Annuelle d'Entreprises) are made. All firms subject to the Bénéfices Industriels et Commerciaux regime (a fiscal regime mandatory for all firms with a turnover above 3,000,000FF in 1990 and 1,000,000FF in 1990 in the service industries) are included. Roughly 2,000,000 firms are present each year in the database. In 1990, these firms comprised more than 60% of the total number of firms in France whereas their turnover comprised more than 94% of total turnover of firms in France. The analysis period is 1984 to 1992. Hence, the BAL-SUSE is dynamically representative of French enterprises in all sectors except the public sector. From this source, we use balance sheet information (total sales, total labor costs, total wage-bill, sales,value-added, total purchases, total assets, full-time employment, and, finally, the dates of creation and of death, if any). The total number of observations is greater than 13,000,000. To deflate those variables, I use various industry-level prices, production, value-added, and wages. All these prices come from French National Accounts using a 2-digit level of aggregation (24 manufacturing industries, in the NAP classification).

Since the Customs file contains only information on the trade of goods – nothing on services – we will essentially focus on firms from the manufacturing sectors as well as on firms of the trade (retail or wholesale) sectors that may import goods in place of manufacturing firms and, therefore, act as competitors of these manufacturing firms.

The data on workers come from two data sources, the Déclarations Annuelles de Données Sociales (DADS) and the Echantillon Démographique Permanent (EDP) that are matched. The DADS is a longitudinal dataset based on firm declarations of individual wages to the fiscal administration. An extract of the original information is sent to the French statistical institute (INSEE) for statistical purposes. It consists of a 1/25th sample of the individuals based on their date of birth (october of an even year). Information is available whenever these individuals are employed by a firm of the private or the semi-public sector in any given year. Our sample period goes from 1976 to 1996. Data were not computerized both in 1981, 1983, and 1990. The EDP is a collection of sociodemographic information on individuals and their families. It comes from the various Censuses (1968, 1975, 1982, and 1990) and from the registers of the Civil Status which collect data on births, deaths, marriages.

The DADS data set: Our main data source is the DADS, a large collection of matched employer-employee information collected by INSEE (Institut National de la Statistique et des Etudes Economiques) and maintained in the Division des revenus. The data are based upon mandatory employer reports of the gross earnings of each employee subject to French payroll taxes. These taxes apply to all "declared" employees and to all self-employed persons, essentially all employed persons in the economy.

The Division des revenus prepares an extract of the DADS for scientific analysis, covering all individuals employed in French enterprises who were born in October of even-numbered years, with civil servants excluded.[29] Our extract runs from 1976 through 1996, with 1981, 1983, and 1990

[29] Meron (1988) shows that individuals employed in the civil service move almost exclusively to other

excluded because the underlying administrative data were not sampled in those years. Starting in 1976, the division revenus kept information on the employing firm using the newly created SIREN number from the SIRENE system. However, before this date, there was no available identifier of the employing firm. Each observation of the initial dataset corresponds to a unique individual-year-establishment combination. The observation in this initial DADS file includes an identifier that corresponds to the employee (called ID below) and an identifier that corresponds to the establishment (SIRET) and an identifier that corresponds to the parent enterprise of the establishment (SIREN). For each observation, we have information on the number of days during the calendar year the individual worked in the establishment and the full-time/part-time status of the employee. For each observation, in addition to the variables mentioned above, we have information on the individual's sex, date and place of birth, occupation, total net nominal earnings during the year and annualized net nominal earnings during the year for the individual, as well as the location and industry of the employing establishment. The resulting data set has 13,770,082 observations.

The Echantillon Démographique Permanent: The division of Etudes Démographiques at INSEE maintains a large longitudinal dataset containing information on many sociodemographic variables of all French individual. All individuals born in the first four days of the month of October of an even year are included in this sample. All questionaires for these individuals from the 1968, 1975, 1982, and 1990 Censuses are gathered into the EDP. Since the exhaustive long-forms of the various Censuses were entered under electronic form only for a fraction of the population leaving in France (1/4 or 1/5 depending on the date), the division des Etudes Démographiques had to find all the Censuses questionaires for these individuals. The INSEE regional agencies were in charge of this task. But, not all information from these forms were entered. The most important sociodemographic variables are however available.[30]

For every individual, education measured as the highest diploma and the age at the end of school are collected. Since the categories differ in the three Censuses, we first created eight education groups (identical to those used in Abowd, Kramarz, and Margolis, 1999) that are later aggregated in three education groups, labelled low-, medium-, and high-education. The following other variables are collected: nationality (including possible naturalization to French citizenship), country of birth, year of arrival in France, marital status, number of kids, employment status (wage-earner in the private sector, civil servant, self-employed, unemployed, inactive, apprentice), spouse's employment status, information on the equipment of the house or appartment, type of city, location of the residence (region and department). At some of the Censuses, data on the parents education or social status are collected.

In addition to the Census information, all French town-halls in charge of Civil Status registers and ceremonies transmit information to INSEE for the same individuals. Indeed, any birth, death, wedding, and divorce involving an individual of the EDP is recorded. For each of the above events, additional information on the date as well as the occupation of the persons concerned by the events

positions within the civil service. Thus the exclusion of civil servants should not affect our estimation of a worker's market wage equation.

[30] Notice that no earnings or income variables have ever been asked in the French Censuses.

are collected.

Finally, both Censuses and Civil Status information contain the person identifier (ID) of the individual.

Creation of the Matched Data File: Based on the person identifier, identical in the two datasets (EDP and DADS), it is possible to create a file containing approximately one tenth of the original 1/25th of the population born in october of an even year, i.e. those born in the first four days of the month. Notice that we do not have wages of the civil-servants (even though Census information allows us to know if someone has been or has become one), or the income of self-employed individuals. Then, this individual-level information is matched with the firm-level information. Because we focus on the imports of various goods, we keep all observations of individuals employed in a manufacturing firm at some point during the period 1986 to 1992. The resulting and final number of observations is 112,682 (when the first measure of quasi-rent is used) and 111,380 (when the quasi-rent with assets discounted) for whom all time-varying person and firm-level characteristics are non-missing.[31] Descriptive statistics are given in Table A.1.

[31] And outliers eliminated. Notice that less than a hundred observations have missing information on education. All programs are available from the author.

Appendix B: Derivation of the Bargaining Model When Workers' Characteristics Matter

Let us consider the program of a firm j which employs L_{jt} workers at date t. Assume that each individual worker i has a set of characteristics z_{it}, observed by i's employing firm j. Denote l_j the measure of these characteristics within the firm defined on the space X_{jt}. Hence, $l_{jt} = \int_{\mathcal{X}_{jt}} l_j(z_{it})dz_{it}$. Then, the profit function of the firm of employing these workers is :

$$\pi_{jt} = p_{jt}f(l_{jt}) - \int_{\mathcal{X}_{jt}} w_{it}(z_{it})l_j(z_{it})dz_{it} \tag{6.1}$$

where $w_{it}(z_{it})$ is the wage paid to a worker with characteristics z_{it} and p_{jt} is the price of the good produced by j at t. This price reflects product market conditions and could also incorporate technology characteristics. Therefore, $WB = \int_{\mathcal{X}_{jt}} w_{it}(z_{it})f(z_{it})dx_{it}$, are the total labor costs. When the firm and workers bargain efficiently over wages and employment, the following static objective is a natural extension of the classic model :

$$\max_{w(.),l_j(.)} \left[(1-\theta_j)\ln \pi_{jt} + \int_{\mathcal{X}_{jt}} \theta_j(z_{it}) \ln\left[(w_{it}(z_{it}) - w^a_{it}(z_{it}))l_j(z_{it})\right] dz_{it} \right] \tag{6.2}$$

where $\int_{\mathcal{X}_{jt}} \theta_j(z_{it})dz_{it} = \theta_j$ and where $w^a_{it}(z_{it})$ denotes worker i's alternative wage. The objective has two parts: one for the firm, the other one for the workers. This setup corresponds to a bargaining game between all parties, the firm and the workers bargain with the firm but also between themselves over their share of the rent $w_{it}(z_{it}) - w^a_{it}(z_{it})$ given their characteristics z_{it} and bargaining power $\theta_j(z_{it})$. As usual in this setup, the threat points are respectively zero profits for the firm and the workers' alternative wage (opportunity cost of time). The major difference with the classic model is the replacement of $\theta_j \ln\left[l_j(w_j - w^a_j)\right]$ where w_j denotes some measure of the average wage at the firm j and w^a_j some measure of the opportunity wage of the workers employed at the same firm by the integral $\int_{\mathcal{X}_{jt}} \theta_j(z_{it}) \ln\left[(w_{it}(z_{it}) - w^a_{it}(z_{it}))l(z_{it})\right] dz_{it}$ that captures the potential differences in bargaining power across workers at the firm (see Osborne and Rubinstein, 1990, page 23 for the simplest extension to more than two players). After simple computations, first-order conditions are as follows

$$\begin{array}{rcl} p_{jt}f'(l_{jt}) & = & w^a_{it}(z_{it}) \\ w_{it}(z_{it}) & = & w^a_{it}(z_{it}) + \pi^a_{jt}\frac{\theta_j(z_{it})}{l_j(z_{it})} \end{array} \tag{6.3}$$

where π^a_{jt} denotes the total quasi-rent

$$\pi^a_{jt} = p_{jt}f(l_{jt}) - \int_{\mathcal{X}_{jt}} w^a_{it}(z_{it})l_j(z_{it})dz_{it} \tag{6.4}$$

To summarize the results, the equations that define the outcome of the bargaining are similar to those described, for instance in Abowd and Lemieux (1993), with the simple difference that the bargaining power depends on workers' characteristics.

Appendix C: Endogeneity and Instruments; a Detailed Discussion

To understand the results of Table 3, several points must be discussed. First, all my regressions control for the person-specific unobserved heterogeneity using the estimated person effect. More precisely, all estimates, in this table as well as in those that follow, include an estimated person effect that results from estimating (4.1) using OLS in which log-earnings are regressed on a quartic in experience, a time-varying indicator for living in the Paris Region, an indicator for working full-time, these three variables being fully interacted with sex indicators, and, more importantly here, a person fixed effect and a firm fixed effect. The full least squares solution for equation (4.1) is obtained using the full sample of more than 13 millions observations and a conjugate gradient algorithm.[32] These last two effects are then used in the restricted sample that is analyzed here. The estimated person effect is directly used in the regression as an additional control variable whereas the firm effect is used to compute the quasi-rent using equation (4.3). More precisely, each regression includes the following variables: experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate, 3-digit industry indicators, the estimated person-effect, and a full interaction of the estimated person-effect with all previous variables (except seniority and the industry indicators). Most of these variables are not available in the full DADS sample but only in the match between DADS and EDP.

In Table 3, I use two measures of the quasi-rent. In the first one presented in column (1), I apply the formula given in the theory section. The second measure, presented in column (2), subtracts from the formula a measure of the real opportunity cost of capital of 3% per annum (as in Abowd and Allain, 1996). Results using the two measures of quasi-rent are almost identical. They show that the bargaining power is roughly equal to 0.17. They also tend to support the idea that workers still employed in manufacturing industries benefit from their employing firm's imports. Import competition effects are apparently absent from these estimates (except for the imports of intermediates from the industry's competitors). In addition, returns to seniority are small and negative at the start of the spell (wages are expressed in 1,000 French Francs).

However, these OLS estimates are likely to be affected by endogeneity biases. Therefore, I test for endogeneity of the main variables of my wage model: firm-level quasi-rent, firm-level imports of goods (as a fraction of production), firm-level imports of intermediates (as a ratio of local purchases), the competitors import behavior (the 99th percentile of the distribution of imports of goods as a fraction of production in the same 4-digit sector and the 99th percentile of the distribution of imports of intermediates as a fraction of local purchases in the same 4-digit sector), worker's seniority, and seniority-square. The test strategy that I use is very simple. I regress each potentially endogenous variable on the set of instruments (lagged export price indices of US firms to 4 destinations by 3-digit industries) and the wage equation exogenous variables. I compute the

[32] See Abowd, Creecy, and Kramarz (2002). Notice that I do not correct for the fact that this person effect is estimated. Since I know the asymptotic variance of this effect as well as the covariance with other explanatory variables, I could push in this direction. However, first attempts at doing so show that this correction would be trivial.

residuals of these regressions and augment the wage equation with these residuals. The exogeneity test amounts to a zero coefficient on the residual in this last equation for the variable of interest. For robustness purposes, I used the two measures of the quasi-rent. Results point to similar conclusions. All variables but quasi-rent and seniority are exogenous in this person-level wage equation.[33]

Note again that the analysis sample is restricted for three reasons: a) only those workers that are present both in the DADS and in the EDP are included because I want to control for the (many more) variables present in the DADS-EDP match (that are not present in the DADS itself, as explained just above); b) the observation period is restricted to 1986 to 1992, the only years for which I also observe the import behavior of firms; c) only manufacturing workers are included since, again, imports are restricted to imports of goods (not services) even though I observe and use imports of such goods coming from other sectors such as the retail or wholesale trade industries. Of course, I could directly include person- and firm-fixed effects in equation (4.4). However, the relatively small number of observations per person and per firm would lead to potentially very imprecise estimates and this imprecision would affect all other coefficients. Therefore, I chose to use in equation (4.4) these effects as estimated from (4.1). Coefficients presented in all Tables are therefore estimated in the panel dimension since I control for the unobserved, but measured, heterogeneity on the worker side as well as measured heterogeneity on the firm side.[34] [35]

Since quasi-rent and seniority are the only variables that must be instrumented when estimating the wage equation, it is useful to examine the instrumenting equations for these two variables. As explained previously, I instrument the rent and seniority with lagged export prices of US firms to 4 destinations: OECD countries, eastern European countries, oil producers, developing countries by manufacturing industry (by 3-digit industry). For instance, to instrument seniority in 1987, I use prices from 1985 and 1986. Note that I do not use all prices, but only those that passed the various exogeneity tests that I conducted.[36] The detailed estimates are available from the author, but are summarized in Tables C.2 and C.3 (in Appendix C). First, consider Table C.2 which presents results for the quasi-rent. Because export prices should be set on the global market, export prices for US firms should be correlated with export prices for French firms. Abowd and Allain (1996) provide such evidence although the correlation is not perfect. If it were, most coefficients should be positive in this regression: an increase in price for American firms means better profit conditions for French firms. As can be seen in Table C.2, this is not always so. When export prices of US firms to OECD countries increase, the quasi-rent in French firms indeed increases; French firms apparently benefit from these higher prices. On the other hand, when export prices to Eastern European countries increase, quasi-rent of French firms decreases; possibly indicating increased import competition

[33] I also estimated wage equations with competitors behavior treated as endogenous variables with no impact on my results. All these results are available from the author.

[34] I will discuss results that include a person fixed effect (unobserved) when presenting the robustness of my estimates.

[35] In what follows, I do not correct for the presence of estimated coefficients because these person and firm effects are quite precisely estimated given the length and size of my data source (see Abowd, Creecy, Kramarz, 2002 for the formulas of the variance of these effects).

[36] This explains why the years used in Table 2 (and following) differ from those of Table 1: prices between 1981 and 1984 were not informative to instrument seniority and firm-level variables.

between French and American firms. More clearly, an increase in export prices to oil-producing countries is likely to reflect an increase in oil prices, directly affecting (negatively) profits in France. However, two effects are at play. Quasi-rent mixes profits and workers' opportunity wages. And, if both increase at different rates, negative signs have a potential economic interpretation. Now, consider Table C.3 which presents results for seniority. Here, for most destinations and dates, coefficients are positive. This agrees with the view that price increases translates into lower pressure on workers, potentially because workers are in better position vis-à-vis the firms. At this stage, the large number of coefficients that are significantly different from zero is a very good indication of the usefulness of these instruments.

Table A.1: Descriptive Statistics

	Mean	Std Dev
Earnings	94.9813	94.8287
Quasi-Rent	83.1629	76.7386
Quasi-Rent (assets discounted)	72.9103	71.5158
(Imports of goods)/production	0.0559	0.1213
(Imports of IC)/(Local purchases)	0.1090	0.2058
(Imports of goods from Europe)/production	0.0412	0.0979
(Imports of goods from other OECD)/production	0.0069	0.0331
(Imports of goods from close low-wage countries)/production	0.0035	0.0253
(Imports of goods from far-away low-wage countries)/production	0.0043	0.0253
(Imports of IC from Europe)/local purchases	0.0842	0.1699
(Imports of IC from other OECD)/local purchases	0.0133	0.0556
(Imports of IC from close low-wage countries)/local purchases	0.0044	0.0311
(Imports of IC from far-away low-wage countries)/local purchases	0.0072	0.0379
Competitors imports of goods (99th perc.,sh. of production)	0.4180	0.2972
Competitors imports of IC (99th perc., sh. of local purchases)	0.4806	0.3003
Competitors imports of goods (99th perc., in level)	442594.4	1555874.0
Competitors imports of IC (99th perc., in level)	147449.3	442278.9
Imports of goods from the trade ind. (sh. of total purchases)	6.3927	5.5426
Imports of goods from the trade industry (total level)	2.4014	10.8722
Person-effect	0.8119	0.4610
Firm-effect	1.5363	1.1317
Experience	19.5901	11.4992
Seniority	8.3349	8.3874
Experience in France	0.6552	4.0437
Married	0.6010	0.4897
Leaves in couple	0.0628	0.2427
A child between 0 and 3	0.0957	0.2942
A child between 3 and 6	0.0877	0.2829
Leaves in Paris region	0.1228	0.3283
Part-time	0.0822	0.2747
Local unemployment rate	9.7351	2.2694
Male	0.6842	0.4649

Notes: Sources: DADS, EDP, Customs file and BAL. 1986-1992. Number of observations: 112,682 for quasi-rent; 111,380 for quasi-rent with assets discounted and other firm-level variables; 112,682 for person-level variables.

Table C.1: Using U.S. Export Prices to Instrument the Price of Value-Added in French Manufacturing

	Firm-Level Real Sales		
	(1)	(2)	(3)
	OLS	Firm Fixed Effects	IV (in 1st difference)
Price of Value-Added (Industry-level)	-0.5015	0.1555	0.4580
	(0.1046)	(0.0443)	(0.1756)
Wage (Industry-level)	2.3416	0.1664	0.4714
	(0.0535)	(0.0772)	(0.0811)
R-Square	0.0377	0.9673	0.0077
Number of Observations	60,197	60,197	42,402

Notes: Each observation is a firm-year. The prices and wages are measured at the 2-digit level (40 industries). The sample period is 1986-1992. Instruments for the industry-level price of value-added are export prices in US $ for the years 1981-1986 of US firms to 4 destinations.

Sources: BAL-SUSE, French National Accounts, OECD

Table C.2: Summary of the Signs and Significance of the Coefficients in the Regression of Quasi-Rent on U.S. Export Prices to Various Destinations

	Destination			
	Eastern Countries	OECD Countries	Petroleum Producers	Developing Countries
Year 1985	Always Negative	Always Positive	Always Negative	Always Negative
Year 1986	Negative	Always Positive	Most Positive, Once Negative	Always Positive
Year 1987	Always Negative	Always Positive	Once Positive, Once Negative	n.s.
Year 1988	n.s.	Always Positive	n.s.	n.s.
Year 1989	n.s.	Always Positive	n.s.	Negative

This Table reports the signs and significance of the instrumenting regression of quasi-rent on US export prices. n.s. means that the coefficients in that cell (country-year) are never significantly different from zero in the regression. Similarly for the other cells country-year. Always Positive means that the coefficients for that cell are often positive, significantly so, and sometimes not significantly different from zero. Positive means that they are sometimes positive, significantly so, and often not significantly different from zero. Similarly for negative signs. The regression also includes measures of the workers' employing firms imports, of the competitors imports, and experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate, the estimated person-effect, industry indicators (3-digit), and a full interaction of the person-effect with all previous variables (except seniority, import variables, and industry indicators).

111,380 person-year observations. The sample period is 1986-1992.

Table C.3: Summary of the Signs and Significance of the Coefficients in the Regression of Seniority on U.S. Export Prices to Various Destinations

	Destination			
	Eastern Countries	OECD Countries	Petroleum Producers	Developing Countries
Year 1985	n.s.	Always Positive	Always Positive	Always Positive
Year 1986	Always Negative	Most Positive, Once Negative	Always Negative	Always Positive
Year 1987	Most Positive, Once Negative	Always Positive	n.s.	n.s.
Year 1988	Positive	n.s.	n.s.	n.s.
Year 1989	Positive	Always Positive	n.s.	n.s.

This Table reports the signs and significance of the instrumenting regression of seniority on US export prices. n.s. means that the coefficients in that cell (country-year) are never significantly different from zero in the regression. Similarly for the other cells country-year. Always Positive means that the coefficients for that cell are often positive, significantly so, and sometimes not significantly different from zero. Positive means that they are sometimes positive, significantly so, and often not significantly different from zero. Similarly for negative signs. The regression also includes measures of the workers' employing firms imports, of the competitors imports, and experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate, the estimated person-effect, industry indicators (3-digit), and a full interaction of the person-effect with all previous variables (except seniority, import variables, and industry indicators). 111,380 person-year observations.
The sample period is 1986-1992.

Table D.1 : Workers' Wages: The Respective Roles of Workers' Bargaining Power and Firm-Level Imports, Controlling for Competitors' Imports
Robustness Check with the Firm Fixed-Effect
(Firms' Quasi-Rent and Workers' Seniority Instrumented)

	Wage-Level With firm fixed-effect
Quasi-Rent	0.2114
	(0.0222)
	[0.0375]
Firm fixed-effect	4.6988
	(2.0199)
	[2.1284]
(Imports of goods)/production	32.1716
	(5.2510)
	[9.1630]
(Imports of IC)/(Local purchases)	23.4902
	(4.6798)
	[5.7137]
[(Imports of goods)/production]**2	-0.2930
	(0.0444)
	[0.0752]
[(Imports of IC)/(Local purchases)]**2	-0.1373
	(0.0304)
	[0.0348]
Competitors imports of goods (99 th perc.,sh. of production)	-3.9499
	(1.0225)
	[2.2853]
Competitors imports of IC (99th perc., sh. of local purchases)	3.6446
	(0.8147)
	[1.5369]
Competitors imports of goods (99th perc., in level)	0.0004
	(0.0005)
	[0.0015]
Competitors imports of IC (99th perc., in level)	0.0006
	(0.0014)
	[0.0067]
Imports of goods from the trade ind. (sh. of total purchases)	0.1247
	(0.0853)
	[0.1899]
Imports of goods from the trade industry (total level)	-0.0100
	(0.0156)
	[0.0212]
Seniority	-6.9168
	(1.7334)
	[2.9095]
Seniority-squared/10	2.2444
	(0.7480)
	[1.2522]
Chi-square (df=41)	46.79
Over-identification test (p-value)	0.2469

Notes: 111,380 person-year observations. The sample period is 1986-1992. Regression uses a measure of quasi-rent that discounts assets. The regression includes the following variables (coefficients unreported): experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate,3-digit industry indicators, the estimated person-effect, and a full interaction of the person-effect with all previous variables (except seniority and industry indicators). In all columns, the Quasi-rent, Seniority and Seniority-squared are instrumented by lagged export price indices of US firms to 4 destinations in US $ of the same industry as the employing firm. The chi-square tests the validity of the instruments. Robust standard errors are between parentheses. Robust standard errors allowing for clustering at the industry-level are between brackets.
Sources: BAL-SUSE for firm-level variables, DADS-EDP for individual variables, Customs file for import measures, OECD for the export prices.

Table 1: Rents, Employment, Labor Costs and Trade Competition

	Quasi-Rent	Quasi-Rent (>50)	Quasi-Rent (<=50)	Employment (in logs)	Employment (in logs, >50)	Employment (in logs, <=50)	Labor Costs (per emp., in logs)	Labor Costs (per emp., in logs, <50)	Labor Costs (per emp., in logs, <=50)
Competitors imports of goods (99th perc.,sh. of production)	-9.2959	-10.0339	-3.1311	-0.0234	-0.0113	-0.1078	-0.0191	-0.0135	-0.0658
	(0.6613)	(0.6785)	(2.3566)	(0.0045)	(0.0040)	(0.0185)	(0.0030)	(0.0022)	(0.0165)
	[4.1678]	[4.3443]	[3.3219]	[0.0213]	[0.0213]	[0.0335]	[0.0144]	[0.0136]	[0.0339]
Competitors imports of IC (99th perc., sh. of local purchases)	-12.5085	-13.0270	-1.6365	0.0053	0.0095	-0.0550	-0.0232	-0.0199	-0.0795
	(0.4409)	(0.4425)	(2.0816)	(0.0030)	(0.0026)	(0.0163)	(0.0020)	(0.0015)	(0.0146)
	[5.9985]	[5.9426]	[2.6492]	[0.0269]	[0.0256]	[0.0391]	[0.0080]	[0.0080]	[0.0258]
Intercept	82.8155	92.3066	49.1545	5.9205	6.9320	2.7873	4.6028	4.6568	4.4541
	(0.3276)	(0.3690)	(0.8723)	(0.0022)	(0.0022)	(0.0069)	(0.0015)	(0.0012)	(0.0062)
	[3.6200]	[3.8777]	[1.0572]	[0.0132]	[0.0138]	[0.0156]	[0.0084]	[0.0086]	[0.0131]
R-Square	0.8446	0.8545	0.7855	0.9943	0.9929	0.9423	0.8634	0.9072	0.7276
Number of Observations	119,860	91,070	28,790	121,260	91,808	29,452	121,260	91,808	29,452

Notes: Sources: DADS-EDP matched with BAL-SUSE (BRN). Each regression includes 16,078 (resp. 16,284) firm indicators when 119,860 observations (resp. 121,260 observations). Standard errors between parentheses. Standard errors adjusting for clustering at the detailed industry level (3-digit) between brackets. The quasi-rent is measured per employee.

Table 2: Rents, Employment, Labor Costs and Firm's Trade

	Quasi-Rent	Quasi-Rent (>50)	Quasi-Rent (<=50)	Employment (in logs)	Employment (in logs, >50)	Employment (in logs, <=50)	Employment (in logs, >50)	Employment (in logs, <=50)	Employment (in logs)
Competitors imports of goods (99th perc.,sh. of production)							0.0007	-0.1065	
							(0.0041)	(0.0185)	
							[0.0209]	[0.0320]	
Competitors imports of IC (99th perc., sh. of local purchases)							0.0119	-0.0561	
							(0.0026)	(0.0163)	
							[0.0197]	[0.0282]	
(Imports of goods)/production	-35.2563	-39.0082	3.7053	-0.1286	-0.1333	-0.0660	-0.1343	-0.0472	-0.1286
	(1.6400)	(1.6880)	(5.8838)	(0.0110)	(0.0099)	(0.0464)	(0.0100)	(0.0464)	(0.0110)
	[8.2040]	[8.9514]	[11.2350]	[0.0509]	[0.0545]	[0.0732]	[0.0535]	[0.0734]	[0.0509]
(Imports of IC)/(Local purchases)	7.2746	8.7769	-2.4706	-0.0796	-0.0923	0.0286	-0.0936	0.0308	-0.0796
	(0.8318)	(0.8906)	(2.2513)	(0.0056)	(0.0052)	(0.0176)	(0.0052)	(0.0176)	(0.0056)
	[7.0055]	[8.0317]	[3.4125]	[0.0829]	[0.0962]	[0.0293]	[0.0962]	[0.0293]	[0.0829]
(Total Exports)/(Sales in France)									0.0017
									(0.0217)
									[0.0204]
Intercept	74.0972	82.4073	47.7757	5.9291	6.9529	2.7385	6.9467	2.7869	5.9291
	(0.1435)	(0.1745)	(0.2144)	(0.0010)	(0.0010)	(0.0017)	(0.0023)	(0.0069)	(0.0010)
	[0.6004]	[0.8081]	[0.2374]	[0.0096]	[0.0130]	[0.0017]	[0.0154]	[0.0118]	[0.0096]
R-Square	0.8435	0.8533	0.7855	0.9943	0.9930	0.9421	0.9930	0.9423	0.9943
Number of Observations	119,860	91,070	28,790	121,260	91,808	29,452	91,808	29,452	121,260

Notes: Sources: DADS-EDP matched with BAL-SUSE (BRN). Each regression includes 16,078 (resp. 16,284) firm indicators when 119,860 observations (resp. 121,260 observations). Standard errors between parentheses. Standard errors adjusting for clustering at the detailed industry level (3-digit) between brackets. The quasi-rent is measured per employee.

Table 3: Workers' Wages: The Respective Roles of Workers' Bargaining Power and Firm-Level Imports, Controlling for Competitors' Imports
The OLS View

	Wage Level	
	(1)	(2)
Quasi-Rent	0.1675	0.1779
	(0.0179)	(0.0192)
(Imports of goods)/production	25.7527	26.5634
	(10.6165)	(10.4539)
(Imports of IC)/(Local purchases)	18.8096	18.4185
	(5.0753)	(4.9315)
[(Imports of goods)/production]**2	-0.2432	-0.2473
	(0.0901)	(0.0883)
[(Imports of IC)/(Local purchases)]**2	-0.1097	-0.1066
	(0.0335)	(0.0334)
Competitors imports of goods (99th perc.,sh. of production)	-2.2859	-2.9064
	(1.9552)	(1.9486)
Competitors imports of IC (99th perc., sh. of local purchases)	3.7652	3.8492
	(1.5987)	(1.6043)
Competitors imports of goods (99th perc., in level)	-0.0010	-0.0009
	(0.0006)	(0.0006)
Competitors imports of IC (99th perc., in level)	0.0052	0.0055
	(0.0033)	(0.0031)
Imports of goods from the trade ind. (sh. of total purchases)	0.1793	0.2058
	(0.2287)	(0.2260)
Imports of goods from the trade industry (total level)	-0.0053	-0.0012
	(0.0201)	(0.0204)
Seniority	-0.4992	-0.5020
	(0.1538)	(0.1570)
Seniority-squared/10	0.1262	0.1272
	(0.0705)	(0.0715)
R-Square	0.3353	0.3340

Notes: 111,380 person-year observations. The sample period is 1986-1992. Regression (2) uses a measure of quasi-rent that discounts assets. The regression includes the following variables (coefficients unreported): experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate, 3-digit industry indicators, the estimated person-effect, and a full interaction of the person-effect with all previous variables (except seniority and industry indicators). In all columns, the model is estimated by OLS. Robust standard errors are between parentheses.

Sources: BAL-SUSE for firm-level variables, DADS-EDP for individual variables, Customs file for import measures.

Table 4: Workers' Wages: The Respective Roles of Workers' Bargaining Power and Firm-Level Imports, Controlling for Competitors' Imports. Instrumenting Firms' Quasi-Rent and Workers' Seniority

	Wage Level	
	(1)	(2)
Quasi-Rent	0.1993	0.2212
	(0.0193)	(0.0219)
	[0.0364]	[0.0383]
(Imports of goods)/production	31.3016	32.4917
	(5.2344)	(5.2598)
	[9.1798]	[9.4534]
(Imports of IC)/(Local purchases)	24.0493	23.4162
	(4.6230)	(4.6934)
	[5.7858]	[5.9500]
[(Imports of goods)/production]**2	-0.2905	-0.2970
	(0.0440)	(0.0445)
	[0.0756]	[0.0781]
[(Imports of IC)/(Local purchases)]**2	-0.1404	-0.1361
	(0.0301)	(0.0306)
	[0.0334]	[0.0361]
Competitors imports of goods (99th perc.,sh. of production)	-2.9966	-4.0562
	(1.0072)	(1.0233)
	[2.5254]	[2.2944]
Competitors imports of IC (99th perc., sh. of local purchases)	3.7122	3.8616
	(0.8054)	(0.8162)
	[1.5832]	[1.5581]
Competitors imports of goods (99th perc., in level)	0.0001	0.0003
	(0.0005)	(0.0005)
	[0.0015]	[0.0015]
Competitors imports of IC (99th perc., in level)	0.0014	0.0010
	(0.0014)	(0.0014)
	[0.0066]	[0.0067]
Imports of goods from the trade ind. (sh. of total purchases)	0.1196	0.1389
	(0.0847)	(0.0853)
	[0.2163]	[0.2023]
Imports of goods from the trade industry (total level)	-0.0143	-0.0102
	(0.0159)	(0.0158)
	[0.0198]	[0.0221]
Seniority	-5.8943	-7.1116
	(1.6952)	(1.7393)
	[3.1354]	[2.9524]
Seniority-squared/10	1.8804	2.3738
	(0.7308)	(0.7496)
	[1.3089]	[1.2677]
Nullity of the Instruments for the Quasi-Rent (F-Statistics)	77.8	72.11
Nullity of the Instruments for Seniority (F-Statistics)	7.39	7.39
Chi-square (df=39)	48.1229	47.3190
Over-identification test (p-value)	0.1501	0.1694

Notes: 111,380 person-year observations. The sample period is 1986-1992. Regression (2) uses a measure of quasi-rent that discounts assets. The regression includes the following variables (coefficients unreported): experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate, 3-digit industry indicators, the estimated person-effect, and a full interaction of the person-effect with all previous variables (except seniority and industry indicators). In all columns, the Quasi-rent, Seniority and Seniority-squared are instrumented by lagged export price indices of US firms to 4 destinations in US $ of the same industry as the employing firm. The chi-square tests the validity of the instruments. Robust standard errors are between parentheses. Robust standard errors allowing for clustering at the industry-level are between brackets.
Sources: BAL-SUSE for firm-level variables, DADS-EDP for individual variables, Customs file for import measures, OECD for the export prices.

Table 5: Workers' Wages: The Respective Roles of Workers' Bargaining Power and Firm-Level Imports, Controlling for Competitors' Imports By Experience Levels
(Firms' Quasi-Rent and Workers' Seniority Instrumented)

	Wage Level		
	Experience, 20 years and above	Experience, bet. 5 and 20 years	Experience, 5 years and below
Quasi-Rent	0.1685	0.2416	0.2455
	(0.0234)	(0.0498)	(0.0388)
	[0.0507]	[0.0413]	[0.0442]
(Imports of goods)/production	43.7262	18.5009	-8.5910
	(8.6351)	(7.0055)	(7.4236)
	[14.0055]	[6.1633]	[9.9740]
(Imports of IC)/(Local purchases)	41.6120	-5.5817	-2.7293
	(6.6545)	(6.1505)	(6.0186)
	[5.6778]	[7.7348]	[10.4089]
[(Imports of goods)/production]**2	-0.4101	-0.1536	0.0399
	(0.0756)	(0.0561)	(0.0597)
	[0.1185]	[0.0518]	[0.0928]
[(Imports of IC)/(Local purchases)]**2	-0.2406	0.0381	-0.0029
	(0.0423)	(0.0449)	(0.0353)
	[0.0352]	[0.0543]	[0.0549]
Competitors imports of goods (99th perc.,sh. of production)	-4.7280	-3.3804	2.8530
	(1.6532)	(1.2197)	(1.9481)
	[3.0916]	[2.2912]	[2.5777]
Competitors imports of IC (99th perc., sh. of local purchases)	3.7618	4.8387	2.3093
	(1.3366)	(0.9765)	(1.6680)
	[1.9316]	[1.4566]	[1.5743]
Competitors imports of goods (99th perc., in level)	0.0002	-0.0016	-0.0009
	(0.0007)	(0.0007)	(0.0006)
	[0.0013]	[0.0010]	[0.0012]
Competitors imports of IC (99th perc., in level)	-0.0004	0.0089	0.0093
	(0.0021)	(0.0019)	(0.0024)
	[0.0046]	[0.0036]	[0.0055]
Imports of goods from the trade ind. (sh. of total purchases)	0.1581	0.2062	0.0487
	(0.1424)	(0.1023)	(0.2022)
	[0.3050]	[0.2252]	[0.3192]
Imports of goods from the trade industry (total level)	0.0020	-0.0088	-0.0436
	(0.0213)	(0.0247)	(0.0431)
	[0.0166]	[0.0205]	[0.0348]
Seniority	-4.2058	1.9591	-4.8598
	(1.9384)	(2.5945)	(11.3516)
	[2.7771]	[3.8647]	[11.9107]
Seniority-squared/10	1.3548	-1.6146	9.6794
	(0.7425)	(1.7006)	(22.4539)
	[1.2083]	[1.8766]	[20.1868]
Chi-square (df=39)	37.96	44.88	23.60
Over-identification test (p-value)	0.5170	0.2389	0.9755
Number of Observations	55,196	42,032	14,152

Notes: The sample period is 1986-1992. Regressions use a measure of quasi-rent that discounts assets. The regression includes the following variables (coefficients unreported): experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate,3-digit industry indicators, the estimated person-effect, and a full interaction of the person-effect with all previous variables (except seniority and industry indicators). In all columns, the Quasi-rent, Seniority and Seniority-squared are instrumented by lagged export price indices of US firms to 4 destinations in US $ of the same industry as the employing firm. The chi-square tests the validity of the instruments. Robust standard errors are between parentheses. Robust standard errors allowing for clustering at the industry-level are between brackets.
Sources: BAL-SUSE for firm-level variables, DADS-EDP for individual variables, Customs file for import measures, OECD for the export prices.

Table 6: Workers' Wages: The Respective Roles of Workers' Bargaining Power and Firm-Level Imports, Controlling for Competitors' Imports
Does the Country of Origin of Imports Matter ?
(Firms' Quasi-Rent and Workers' Seniority Instrumented)

	Wage Level			
	Full Sample	Experience, 20 years and above	Experience, bet. 5 and 20 years	High-School Dropouts
Quasi-Rent	0.2215	0.2006	0.2395	0.1788
	(0.0212)	(0.0222)	(0.0495)	(0.0200)
	[0.0412]	[0.0468]	[0.0412]	[0.0426]
(Imports of goods from European countries)/production	27.8506	44.9507	16.0984	17.8596
	(6.0354)	(10.2317)	(7.9793)	(4.9005)
	[9.7647]	[15.8164]	[5.1385]	[10.2503]
(Imports of goods from other OECD countries)/production	37.9946	44.2497	25.8600	6.8188
	(6.2940)	(10.0687)	(9.1401)	(6.8391)
	[16.8831]	[15.0201]	[18.5891]	[12.9177]
(Imports of goods from close low-wage countries)/production	21.5399	28.5953	15.9067	23.6371
	(9.4109)	(20.3445)	(11.7110)	(11.4069)
	[8.2747]	[19.6395]	[10.2068]	[14.3781]
(Imports of goods from far-away low-wage countries)/production	33.1639	29.3563	33.1589	22.8010
	(7.6565)	(14.5052)	(10.2398)	(10.9277)
	[11.0633]	[18.5690]	[16.7411]	[16.7040]
(Imports of IC from European countries)/(Local purchases)	21.4328	42.1347	-5.7301	21.2586
	(4.4500)	(6.7233)	(5.4405)	(3.9646)
	[7.2179]	[6.9658]	[7.3763]	[5.8319]
(Imports of IC from other OECD countries)/(Local purchases)	20.6793	41.7207	-10.1888	28.7614
	(7.4503)	(11.2067)	(10.7621)	(8.1848)
	[6.4613]	[11.9436]	[12.1854]	[14.1765]
(Imports of IC from close low-wage countries)/(Local purchases)	16.4485	17.4860	16.0188	25.9995
	(6.8521)	(7.5904)	(15.9993)	(9.3205)
	[7.1213]	[8.1726]	[13.4760]	[7.0632]
(Imports of IC far-away low-wage countries)/(Local purchases)	20.8523	49.8102	-14.3944	23.6833
	(7.7396)	(11.9650)	(10.4993)	(7.3687)
	[15.1242]	[18.4726]	[16.9562]	[12.3374]
[(Imports of goods)/production]**2	-0.2663	-0.4056	-0.1518	-0.1709
	(0.0439)	(0.0744)	(0.0575)	(0.0438)
	[0.0668]	[0.1125]	[0.0452]	[0.0789]
[(Imports of IC)/(Local purchases)]**2	-0.1233	-0.2419	0.0427	-0.1280
	(0.0300)	(0.0421)	(0.0449)	(0.0253)
	[0.0415]	[0.0361]	[0.0560]	[0.0338]
Competitors imports of goods (99th perc.,sh. of production)	-3.7391	-4.8068	-3.5343	-2.1691
	(1.0125)	(1.6633)	(1.2083)	(1.1025)
	[2.1555]	[3.1044]	[2.2932]	[2.4121]
Competitors imports of IC (99th perc., sh. of local purchases)	3.9938	3.7736	4.7709	2.6581
	(0.8036)	(1.3251)	(0.9717)	(0.7954)
	[1.4815]	[1.8532]	[1.4034]	[2.4173]
Competitors imports of goods (99th perc., in level)	-0.0001	0.0005	-0.0017	0.0014
	(0.0005)	(0.0007)	(0.0007)	(0.0007)
	[0.0015]	[0.0015]	[0.0011]	[0.0017]
Competitors imports of IC (99th perc., in level)	0.0022	-0.0015	0.0090	0.0020
	(0.0013)	(0.0020)	(0.0019)	(0.0021)
	[0.0056]	[0.0048]	[0.0036]	[0.0069]
Imports of goods from the trade ind. (sh. of total purchases)	0.1394	0.1296	0.1999	0.1733
	(0.0838)	(0.1424)	(0.1003)	(0.0748)
	[0.2004]	[0.2656]	[0.2260]	[0.1848]
Imports of goods from the trade industry (total level)	-0.0099	-0.0029	-0.0097	0.0037
	(0.0155)	(0.0210)	(0.0245)	(0.0204)
	[0.0210]	[0.0184]	[0.0202]	[0.0283]
Chi-square (df=41)	56.32	42.35	45.71	34.19
Over-identification test (p-value)	0.0559	0.4124	0.2829	0.7654
Number of Observations	111,380	55,196	42,032	51,060

Notes: The sample period is 1986-1992. Regressions use a measure of quasi-rent that discounts assets. The regression includes the following variables (coefficients unreported): experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate,3-digit industry indicators, the estimated person-effect, and a full interaction of the person-effect with all previous variables (except seniority and industry indicators). In all columns, the Quasi-rent, Seniority and Seniority-squared are instrumented by lagged export price indices of US firms to 4 destinations in US $ of the same industry as the employing firm. The chi-square tests the validity of the instruments. Robust standard errors are between parentheses. Robust standard errors allowing for clustering at the industry-level are between brackets.
Sources: BAL-SUSE for firm-level variables, DADS-EDP for individual variables, Customs file for import measures, OECD for the export prices.

Table 7: Workers' Wages: Workers' Bargaining Power and Firm-Level Imports, Controlling for Competitors' Imports

The Role of Negotiations

(Firms' Quasi-Rent and Workers' Seniority Instrumented)

		Wage Level
Quasi-Rent	(neg. on employment)	0.5211
		(0.0521)
		[0.0853]
Quasi-Rent	(no neg. on employment)	0.0185
		(0.0384)
		[0.0406]
(Imports of goods)/production	(neg. on employment)	21.8944
		(17.1492)
		[34.2176]
(Imports of goods)/production	(no neg. on employment)	24.6543
		(4.7628)
		[10.5556]
(Imports of IC)/(Local purchases)	(neg. on employment)	-47.6270
		(15.7203)
		[46.5176]
(Imports of IC)/(Local purchases)	(no neg. on employment)	6.9186
		(4.9157)
		[12.7914]
Competitors imports of goods (99th perc.,sh. of production)	(neg. on employment)	-41.5820
		(7.5401)
		[13.9573]
Competitors imports of goods (99th perc.,sh. of production)	(no neg. on employment)	-3.1373
		(1.5790)
		[2.7383]
Competitors imports of IC (99th perc., sh. of local purchases)	(neg. on employment)	-20.2981
		(4.9574)
		[16.3141]
Competitors imports of IC (99th perc., sh. of local purchases)	(no neg. on employment)	5.1224
		(0.9143)
		[2.3842]
Chi-square (df=38)		47.0476
Over-identification test (p-value)		0.1491

Notes: 37,698 person-year observations. The sample period is 1986-1992. The regression uses a measure of quasi-rent that discounts assets. The regression includes the following variables (coefficients unreported): Competitors imports of goods (99th perc., in level), Competitors imports of IC (99th perc., in level), Imports of goods from the trade ind. (sh. of total purchases), Imports of goods from the trade ind. (total purchases), seniority and seniority-squared, experience(quartic), marital status, indicators for having children below 3, children between 3 and 6, for living in Ile de France, for working part-time, year dummies, experience in France (for the immigrants), the local unemployment rate, 3-digit industry indicators, the estimated person-effect, and a full interaction of the person-effect with all previous variables (except seniority and industry indicators).

The Quasi-rent, Seniority and Seniority-squared are instrumented by lagged export price indices of US firms to 4 destinations in US $ of the same industry as the employing firm. The chi-square tests the validity of the instruments. Robust standard errors are between parentheses. Robust standard errors allowing for clustering at the industry-level are between brackets. Sources: BAL-SUSE for firm-level variables, DADS-EDP for individual variables, Customs file for import measures, OECD for the export prices. ESS for bargaining outcomes.

Table 8: Negotiation in 1992 and Firm-Level Changes in the Preceding Period (1986-92)

	No Negotiation, either on Wages or Employment		Negotiation on Employment and Wages	
	Coef.	Std. Err.	Coef.	Std. Err.
Change in Labor Costs (per person, in logs)	1.2803	0.3207	2.9370	0.3430
Change in Employment (in logs)	0.5041	0.1351	-0.7447	0.1556
Change in Imports of Goods (as a fraction of production)	-1.4728	0.3077	1.7646	0.3230
Change in Imports of IC (as a fraction of local purchases)	0.1312	0.1183	-0.6472	0.1273
Change in the Quasi-rent (per person)	0.0007	0.0005	0.0023	0.0004
Change in the Competitors Imports of IC (99th perc., sh. of local purchases)	0.4842	0.1093	-0.4260	0.1209
Change in the Competitors Imports of Goods (99th perc., sh. of production)	0.7731	0.1742	0.5312	0.1754
Pseudo-R2	0.1818			
Number of Observations	7,210			

Sources: BAL-SUSE for firm-level variables, DADS-EDP for individual variables, Customs file for import measures, OECD for the export prices. ESS for bargaining outcomes. Estimated by Maximum Likelihood. The reference group comprises firms that only negotiated on wages.