DRUID

DRUID Working Paper No. 08-10

Micro-evidence on Rent Sharing from Different Perspectives

By

Sabien Dobbelaere and Jacques Mairesse

Danish Research Unit for Industrial Dynamics

www.druid.dk

Micro-evidence on Rent Sharing from Different Perspectives

Sabien Dobbelaere
Free University Amsterdam, Ghent University
IZA Bonn
The Research Foundation – Flanders (FWO)
E-mail: sdobbelaere@feweb.vu.nl

Jacques Mairesse
CREST
Institut National de la Statistique et des Etudes Economiques (INSEE)
MERIT-Maastricht University, NBER

Abstract:
This article provides evidence of rent sharing from orthogonal directions. Taking advantage of a rich matched employer-employee dataset for France, we compare consistently across-industry heterogeneity in rentsharing parameters relying on three different approaches: (i) the productivity approach, (ii) the accounting approach and (iii) the traditional labor economics approach. Focusing on economically meaningful parameter estimates shows that there exist differences in dispersion across the different approaches but more importantly that the rent-sharing estimates are within a comparable range.

Keywords: Rent sharing; wage equation; production function; matched employer-employee data

Jel codes: C23; D21; J31; J51

ISBN 978- 87-7873-264-4

Acknowledgements:
We are grateful to Bronwyn Hall and other participants at the Danish Research Unit for Industrial Dynamics (DRUID) Conference (Copenhagen, 2008) for helpful comments and suggestions. All remaining errors are ours.

Micro-evidence on rent sharing from different perspectives*

Sabien DOBBELAERE† Jacques MAIRESSE‡

September 2008

Abstract

This article provides evidence of rent sharing from orthogonal directions. Taking advantage of a rich matched employer-employee dataset for France, we compare consistently across-industry heterogeneity in rent-sharing parameters relying on three different approaches: (i) the productivity approach, (ii) the accounting approach and (iii) the traditional labor economics approach. Focusing on economically meaningful parameter estimates shows that there exist differences in dispersion across the different approaches but more importantly that the rent-sharing estimates are within a comparable range.

JEL classification : C23, D21, J31, J51.
Keywords : Rent sharing, wage equation, production function, matched employer-employee data.

1 Introduction

The *theoretical* underpinnings of individual and firm wage heterogeneity can broadly be classified into three categories: matching/search-based models (Jovanovic, 1979; Postel-Vinay and Robin, 2002; Mortensen, 2003; Shimer, 2005), incentive compensation models (Lazear and Rosen, 1981) and rent-sharing models (McDonald and Solow, 1981; Nickell and Andrews, 1983). Regardless of the theoretical model one favors, the exclusion of unobserved individual or firm wage

*We are grateful to Bronwyn Hall and other participants at the Danish Research Unit for Industrial Dynamics (DRUID) Conference (Copenhagen, 2008) for helpful comments and suggestions. All remaining errors are ours.

†Free University Amsterdam, Ghent University, IZA Bonn, visiting CREST. Postdoctoral Fellow of the Research Foundation - Flanders (FWO). Corresponding author: sdobbelaere@feweb.vu.nl

‡CREST, Institut National de la Statistique et des Etudes Economiques (INSEE), MERIT-Maastricht University, NBER.

heterogeneity creates biases in wage equations as well as problems in identifying the underlying sources of wage variation.

On the *empirical* side, there is a large body of studies examining the effect of industry or firm performance on wages using aggregated data (among them Katz and Summers, 1989, Blanchflower et al., 1996, Estevao and Tevlin, 2003 for the US; Abowd and Lemieux, 1993, Christofides and Oswald, 1992 for Canada; Blanchflower et al., 1990, Holmlund and Zetterberg, 1991, Nickell et al., 1994, Hildreth and Oswald, 1997 for European countries) and testing the rent-sharing hypothesis. The seminal contribution of Abowd et al. (1999), providing a statistical decomposition of wage rates into worker and firm effects and focusing on the private sector in France, together with the availability of matched employer-employee datasets, fueled a resurge of interest in this subject. Recent studies investigating the impact of profits on wages using matched worker-firm data include Margolis and Salvanes (2001) for France and Norway, Arai (2003) for Sweden, Kramarz (2003) for France and Martins (2007) for Portugal. Albeit using different models of collective bargaining, the results of these studies indicate, in general, that changes in profitability feed through into long-run changes in wages.

The main contribution of this article to the latter strand of the empirical literature is to provide evidence of rent sharing from orthogonal directions. Taking advantage of a rich matched employer-employee dataset for France, this article can be considered as a companion paper to our previous related research (Dobbelaere and Mairesse, 2008) where we provide an in-depth analysis of imperfections in the product and the labor markets as two sources of discrepancies between the marginal products of input factors and the apparent factor prices. This article compares consistently across-industry heterogeneity in rent-sharing parameters relying on three different approaches: (i) the productivity approach, (ii) the accounting approach and (ii) the traditional labor economics approach. In the first approach, we estimate a productivity equation at the firm level (see Crepon, Desplatz and Mairesse, 1999; Dobbelaere, 2004,; Boulhol and Dobbelaere, 2006; Dobbelaere and Mairesse, 2008). By comparing the estimated factor elasticities for labor and materials and their shares in revenue, we are able to derive estimates of average price-cost mark-up and rent-sharing parameters. In the second approach, we directly compute measures of price-cost mark-up and rent-sharing parameters from the firm accounting information (see also Veugelers, 1989). In the third approach, we estimate directly a wage equation taking into account worker and firm wage heterogeneity. From the estimated profits-wage elasticities, we retrieve average rent-sharing parameters. We compare the estimated elasticities resulting from estimating a wage equation at the worker level with those resulting from estimating a wage equation at the firm level.

We proceed as follows. In Section 2, we present the three approaches. Section 3 discusses the data and focuses on across-industry heterogeneity in extent of rent-sharing parameters within each approach. In Section 4, we compare consistently across-industry heterogeneity in our parameter of interest across the three approaches. Section 5 concludes.

2 Three different approaches to provide rent-sharing evidence

In this section, we present three approaches from which we derive estimates of extent of rent sharing: (i) the productivity approach, (ii) the accounting approach and (iii) the traditional labor economics approach. All three approaches determine the extent of rent-sharing parameters that would prevail if bargaining were to take place according to the asymmetric Nash bargaining model.

2.1 Productivity approach

We rely on the model of Crépon, Desplatz and Mairesse (1999, 2002) that extends Hall (1988)'s framework to allow for the possibility that wages and employment are bargained over between firms and workers. We start from a production function $Q_{it} = \Theta_{it}F(N_{it},\, M_{it},\, K_{it})$, where i is a firm index, t a time index, N is labor, M is material input, K is capital and $F(.)$ is assumed to be homogeneous of degree one in its arguments. Θ_{it} is an index of technical change or "true" total factor productivity. The logarithmic specification of the production function gives:

$$q_{it} = \varepsilon^{Q}_{N_{it}} n_{it} + \varepsilon^{Q}_{M_{it}} m_{it} + \varepsilon^{Q}_{K_{it}} k_{it} + \theta_{it} \tag{1}$$

Each firm operates under imperfect competition in the product market. On the labor side, we assume that the union and the firm are involved in a strongly efficient bargaining procedure with both wages (w) and labor (N) being the subject of an agreement (McDonald and Solow, 1981). The union's objective is to maximize $U(w_{it},\, N_{it}) = N_{it}w_{it} + (\overline{N}_{it} - N_{it})\overline{w}_{it}$, where $\overline{N}_{it}$ is union membership ($0 < N_{it} \leq \overline{N}_{it}$) and $\overline{w}_{it}$ is the outside wage available in the event of a bargaining dispute ($\overline{w}_{it} \leq w_{it}$). Consistent with capital quasi-fixity,[1] the firm objective is to maximize its short-run profit function: $\pi(w_{it},\, N_{it},\, M_{it}) = R(N_{it},\, M_{it}) - w_{it}N_{it} - j_{it}M_{it}$, where $R_{it} = P_{it}Q_{it}$ stands for total revenue. The outcome of the bargaining is the asymmetric generalised Nash solution to:

$$\max_{w_{it},\, N_{it},\, M_{it}} \{N_{it}w_{it} + (\overline{N}_{it} - N_{it})\overline{w}_{it} - \overline{N}_{it}\overline{w}_{it}\}^{\phi_{it}} \{R_{it} - w_{it}N_{it} - j_{it}M_{it}\}^{1-\phi_{it}}$$

$$= \max_{w_{it},\, N_{it},\, M_{it}} \{N_{it}(w_{it} - \overline{w}_{it})\}^{\phi_{it}} \{R_{it} - w_{it}N_{it} - j_{it}M_{it}\}^{1-\phi_{it}} \tag{2}$$

where $\phi_{it} \in [0,\, 1]$ represents the workers' bargaining power.

Maximization with respect to material input gives $R_{M,it} = j_{it}$ with $R_{M,it}$ the marginal revenue of material input, which directly leads to:

$$\varepsilon^{Q}_{M_{it}} = \mu_{it}\alpha_{M_{it}} \tag{3}$$

[1] Crépon et al. (1999, 2000) assume capital quasi-fixity. In their framework, what only matter is that capital is installed before bargaining takes place, which is a very reasonable hypothesis. When assuming that capital adjusts perfectly, the quasi-rents that unions target are lower and therefore a higher bargaining power would be needed empirically to match the data.

$\mu_{it} = \frac{P_{it}}{C_{Q,it}}$ refers to the mark-up of price (P_{it}) over marginal cost ($C_{Q,it}$) and $\alpha_{M_{it}} = \frac{j_{it}M_{it}}{P_{it}Q_{it}}$. Maximization with respect to the wage rate and labor respectively gives the following first-order conditions:

$$w_{it} = \overline{w}_{it} + \gamma_{it}\left[\frac{R_{it} - w_{it}N_{it} - j_{it}M_{it}}{N_{it}}\right] \tag{4}$$

$$w_{it} = R_{N,it} + \phi_{it}\left[\frac{R_{it} - R_{N,it}N_{it} - j_{it}M_{it}}{N_{it}}\right] \tag{5}$$

where $\gamma_{it} = \frac{\phi_{it}}{1-\phi_{it}}$. Eq. (4) states that the equilibrium wage is determined by the outside wage in the event of a bargaining dispute, the relative bargaining strength of the workers and the firm, and the level of profits per employee.

Solving simultaneously (5) and (4) leads to an expression for the contract curve: $R_{N,it} = \overline{w}_{it}$, which shows that the firm decision about employment is the same as if it was maximizing its short-run profit at the outside wage. Expressing the marginal revenue of labor as $R_{N,it} = R_{Q,it}Q_{N,it} = \frac{P_{it}Q_{N,it}}{\mu_{it}}$ and using this expression together with (5), the elasticity of output with respect to employment can be written as:

$$\varepsilon^Q_{N_{it}} = \mu_{it}\alpha_{N_{it}} + \mu_{it}\gamma_{it}\left(\alpha_{N_{it}} + \alpha_{M_{it}} - 1\right) \tag{6}$$

with $\alpha_{N_{it}} = \frac{w_{it}N_{it}}{P_{it}Q_{it}}$. Assuming constant returns to scale $\left(\varepsilon^Q_{N_{it}} + \varepsilon^Q_{M_{it}} + \varepsilon^Q_{K_{it}} = 1\right)$, the capital elasticity can be expressed as:

$$\varepsilon^Q_{K_{it}} = 1 - \mu_{it}\alpha_{M_{it}} - \mu_{it}\alpha_{N_{it}} - \mu_{it}\gamma_{it}\left(\alpha_{N_{it}} + \alpha_{M_{it}} - 1\right) \tag{7}$$

Estimating the following productivity equation:

$$q_{it} - k_{it} = \varepsilon^Q_{N_{it}}(n_{it} - k_{it}) + \varepsilon^Q_{M_{it}}(m_{it} - k_{it}) + \theta_{it} \tag{8}$$

allows the identification of (i) the mark-up of price over marginal cost and (ii) the extent of rent sharing:

$$\mu_{it} = \frac{\varepsilon^Q_{M_{it}}}{\alpha_{M_{it}}} \tag{9}$$

$$\gamma_{it} = \frac{\phi_{it}}{1-\phi_{it}} = \frac{\varepsilon^Q_{N_{it}} - \left(\varepsilon^Q_{M_{it}}\frac{\alpha_{N_{it}}}{\alpha_{M_{it}}}\right)}{\frac{\varepsilon^Q_{M_{it}}}{\alpha_{M_{it}}}\left(\alpha_{N_{it}} + \alpha_{M_{it}} - 1\right)} \tag{10}$$

$$\phi_{it} = \frac{\gamma_{it}}{1+\gamma_{it}} \tag{11}$$

By embedding the efficient bargaining model into a microeconomic version of Hall's (1988) framework, it follows that the firm price-cost mark-up and the extent of rent sharing generate a wedge between output elasticities and factor shares. As a benchmark case, we assume that firms consider input prices as given prior to deciding their level of inputs. In that case, short-run profit maximization with respect to labor would imply that $\varepsilon_{N_{it}}^{Q} = \mu_{it}\alpha_{N_{it}}$ and estimating the productivity equation would lead to the identification of the price-cost mark-up only ($\mu only_{it}$).

2.2 Accounting approach

Dividing Eq. (4) by total revenue $P_{it}Q_{it}$ and defining the wage premium as the difference between the bargained wage and the outside wage in the event of a bargaining dispute ($WP_{it} = w_{it} - \overline{w}_{it}$), we directly compute the price-cost mark-up assuming that firms consider input prices as given prior to deciding their level of inputs ($\mu\ only_{a_{it}}$), the price-cost mark-up taking into account that both wages and employment are the subject of a bargaining agreement $\left(\mu_{a_{it}}\right)$ and the extent of rent sharing $\left(\phi_{a_{it}}\right)$ from the firm accounting information as follows (see also Veugelers, 1989):

$$\mu\ only_{a_{it}} = 1 + \left(\frac{P_{it}Q_{it} - w_{it}N_{it} - j_{it}M_{it}}{P_{it}Q_{it}}\right) \tag{12}$$

$$\mu_{a_{it}} = \frac{P_{it}Q_{it} - \overline{w}_{it}N_{it} - j_{it}M_{it}}{P_{it}Q_{it}} = \mu\ only_{a_{it}} + \frac{(w_{it} - \overline{w}_{it})N_{it}}{P_{it}Q_{it}} \tag{13}$$

$$\gamma_{a_{it}} = \frac{(w_{it} - \overline{w}_{it})N_{it}}{P_{it}Q_{it} - w_{it}N_{it} - j_{it}M_{it}} = \frac{\mu_{a_{it}} - \mu\ only_{a_{it}}}{\mu\ only_{a_{it}} - 1} \tag{14}$$

$$\phi_{a_{it}} = \frac{\gamma_{a_{it}}}{1 + \gamma_{a_{it}}} = \frac{\mu_{a_{it}} - \mu\ only_{a_{it}}}{\mu_{a_{it}} - 1} \tag{15}$$

where the outside wage $\overline{w}_{it}$ is measured by the 5^{th} percentile value of the nominal wage per worker in the industry in which the firm operates.

2.3 Traditional labor economics approach

Following standard practice in the rent-sharing literature, we interpret $\overline{w}_{it}$ as the expected income in the event of a bargaining dispute which is determined by productivity-related characteristics of the worker and the probability of becoming unemployed. Having longitudinal data, we assume that $\overline{w}_{it}$ is captured by year effects and by a proxy of the wage outside the employing firm within the same industry. Hence, the empirical specification of Eq. (4) can be written as:

$$\ln w_{j(i)t} = \ln w_{It} + \gamma_{it} \ln\left(\frac{\pi_{it}}{N_{it}}\right) + \alpha_{j(i)} + \alpha_i + \alpha_t + \epsilon_{jt} \tag{16}$$

where $w_{j(i)t}$ is the annual nominal wage of individual j working in firm i at date t, w_{It} is the 5^{th} percentile value of the nominal wage per worker in industry I in which the employing firm i operates at time t, π_{it} and N_{it} are respectively the profits and employment of the employing firm i at time t, $\alpha_{j(i)}$ is the individual effect, α_i the firm effect, α_t the year effect and ϵ_{jt} the statistical residual.

2.4 Right-to-manage versus efficient bargaining

Equilibrium relation (4) is independent of the true nature of the employment function. In particular, it does not depend on whether employment is determined at the labor demand curve (which would result from the right-to-manage model where the workers and the firm bargain over wages in the first stage, and the firm retains the right to determine its optimal level of employment given the wage in the second stage) or on a contract curve (which would result from the efficient bargaining model where bargaining is about wages and employment).

Contrary to Eq. (4) which would result as a first-order condition from either the right-to-manage model or the efficient bargaining model, Eq. (6) discriminates between the two standard models of rent sharing. In the right-to-manage model, employment is highly endogenous with respect to wages. As in the perfectly competitive labor market case, the marginal revenue of labor is equal to the wage whereas in the efficient bargaining model, employment does not depend directly on the bargained wage. Hence, the null hypothesis of $\gamma_{it} = 0$ in Eq. (6) does not only correspond to the assumption that the labor market is competitive but also to the less restrictive assumption that firms and workers only bargain over wages in a first step and firms unilaterally determine their employment level in a second step (right-to-manage assumption).

Given our purpose of providing micro-evidence on rent sharing from orthogonal directions, we presume that the three approaches rely on the same model of rent sharing. Hence, we assume that the workers and the firm are involved in an efficient bargaining procedure.

3 Data description and a first look at the three approaches

3.1 Data description

We use data from the DADS ("Déclarations Annuelles des Données Sociales") on the matched worker-firm side and firm accounting information from EAE ("Enquête Annuelle d'Entreprise", "Service des Etudes et Statistiques Industrielles" (SESSI)) on the firm side. The DADS is a large-scale administrative database collected by INSEE ("Institut de National de la Statistique et des Etudes Economiques") and maintained in the Division des Revenus. The data are based on a mandatory employer report of the gross earnings of each employee subject to French payroll taxes. These taxes apply to essentially all employed individuals in the economy. The Division des Revenus provides an extract of the DADS for scientific purposes, covering all individuals employed in French enterprises who were born in October of even-numbered years, excluding civil servants.

Our analysis sample is obtained by merging the firm current account and balance sheet data of the 10 646 firms, with the number of observations for each firm varying between 12 and 24, that we used in our previous research (Dobbelaere and Mairesse, 2008) with the matched employer-employee information. Our initial data set contained 1 388 089 observations, each corresponding to a unique firm-worker-year combination. Because of the 1982 and 1990 Census, however, the 1981, 1983 and 1990 DADS data are excluded. To avoid large discrepancies in the number of years available in the matched employer-employee dataset and the firm dataset, we select the period 1984-2001. After some cleaning to eliminate outliers and anomalies, our matched worker-firm dataset contains 1 077 402 observations, corresponding to 209 780 individuals and 10 396 firms. For each observation, we have information on the exact starting date and end date of the job spell in the firm and the full-time/ part-time status of the worker. Each firm-worker-year observation additionally includes information on the individual's sex, month, year and place of birth, current occupation and total net nominal earnings during the year for the individual. Employer characteristics include the location and industry of the employing firm. 9.7% of the employees move at least once between firms (movers).

For regression purposes, we only select full-time stayers who worked 12 months a year. Our final sample contains 719 693 observations, corresponding to 91 353 individuals, 9 121 firms and 38 industries. Concerning the distribution of workers across firms, we observe 2 workers per firm for firms in the first quartile, 3 workers per firm for firms in the second quartile and 7 workers per firm for firms in the third quartile. The number of observations per worker (firm) is 7 (13) for the first quartile of workers (firms), 10 (16) for the second quartile and 13 (16) for the third quartile.

Using the firm dataset, we measure output (Q_{it}) by real current production deflated by the two-digit producer price index of the French industrial classification. Labor (N_{it}) refers to the average number of employees in each firm for each year and material input (M_{it}) refers to intermediate consumption deflated by the two-digit intermediate consumption price index. The capital stock (K_{it}) is measured by the gross bookvalue of fixed assets. The shares of labor ($\alpha_{N_{it}}$) and material input ($\alpha_{M_{it}}$) are constructed by dividing respectively the firm total labor cost and undeflated intermediate consumption by the firm undeflated production and by taking the average of these ratios over adjacent years. Profits per worker ($\frac{\pi_{it}}{N_{it}}$) is measured as value added minus labor costs divided by the average number of employees in each firm for each year. Using the matched worker-firm dataset, the wage ($w_{j(i)t}$) refers to the average net nominal wage per worker. In addition to defining the wage at the worker level, we compute the firm average wage per worker in two wages: (i) computed directly from the firm accounting information as the wage bill divided by the average number of employees in each firm for each year (w_{it}) and (ii) using the worker information and computed as the sum of the workers' wages divided by the number of workers observed in each firm-year $\left(\frac{\sum_{j\in i} w_{j(i)t}}{\sum_{j\in i} j}\right)$. By construction, the latter firm average wage per worker is highly correlated with the average net nominal wage per worker ($w_{j(i)t}$). Table 1 reports the means, standard deviations and quartile values of our main variables. The average growth rate of real firm output for the overall sample is 2.6% per year over the period 1984-2001. Capital has remained stable, while materials and labor have increased at an average annual growth rate of 4% and 0.7% respectively. As expected for firm-level data, the dispersion of all these variables is considerably large. For example, capital growth is smaller than -7.2% for the first quartile of firms and higher than 6.5% for the fourth quartile.

<Insert Table 1 about here>

3.2 A first look at the three approaches

This section concentrates on across-industry heterogeneity in the extent of rent sharing within each approach. We decompose the total sample into 38 manufacturing industries according to the French industrial classification ("Nomenclature économique de synthèse - Niveau 3" [NES 114]). Table A.1 in Appendix A shows the industry repartition of the sample and presents for each industry the number of observations (in the firm and matched worker-firm dataset), the number of firms and the number of workers.

3.2.1 Productivity approach

Being interested in average reduced-form parameters, we estimate the following specification for each industry I over the period 1984-2001:

$$q_{it} - k_{it} = \varepsilon_N^Q (n_{it} - k_{it}) + \varepsilon_M^Q (m_{it} - k_{it}) + \alpha_t + \zeta_{it} \tag{17}$$

The average industry-level price-cost mark-up ($\hat{\mu}_I$), relative extent of rent sharing ($\widehat{\gamma}_I$) and extent of rent sharing ($\widehat{\phi}_I$) are derived from comparing the estimated average output elasticities with the average input shares: $\hat{\mu}_I = \frac{\widehat{\varepsilon}_{M_I}^Q}{\alpha_{M_I}}$, $\widehat{\gamma}_I = \frac{\widehat{\varepsilon}_{N_I}^Q - \left(\widehat{\varepsilon}_{M_I}^Q \frac{\alpha_{N_I}}{\alpha_{M_I}}\right)}{\frac{\widehat{\varepsilon}_{M_I}^Q}{\alpha_{M_I}}\left(\alpha_{N_I} + \alpha_{M_I} - 1\right)}$ and $\widehat{\phi}_I = \frac{\widehat{\gamma}_I}{1+\widehat{\gamma}_I}$.

Table 2 summarizes the system GMM results of the industry analysis.[2] The table is drawn up in increasing order of $\widehat{\gamma}_I$. From Table 2, it follows that industry differences in the parameters are quite sizeable. Considering all industries, the median price-cost mark-up and the median extent of rent sharing are estimated at 1.21 and 0.19 respectively. Concentrating on the industry estimates for which the price-cost mark-up equals or exceeds 1 and the corresponding extent of rent

[2] The GMM estimation is carried out in Stata 9.2 (Roodman, 2005). We report results for the *one*-step estimator, for which inference based on the asymptotic variance matrix is shown to be more reliable than for the asymptotically more efficient two-step estimator (Arellano and Bond, 1991). The specification tests are passed in 25 out of 38 cases. Results not reported but available upon request.

sharing lies in the $[0,1]$-interval [22 industries], the price-cost mark-up $(\widehat{\mu}_I)$ is estimated to be lower than 1.23 for the first quartile of industries and higher than 1.33 for the top quartile. The corresponding estimate of the extent of rent sharing is found to be lower than 0.22 for the first quartile of industries and higher than 0.44 for the top quartile.

<Insert Table 2 about here>

3.2.2 Accounting approach

Table 3 presents for each industry I the distribution of the firm-level price-cost mark-up assuming that firms consider input prices as given prior to deciding their level of inputs ($\mu\ only_{a_I}$), the price-cost mark-up taking into account that both wages and employment are the subject of a bargaining agreement (μ_{a_I}) and the extent of rent sharing (ϕ_{a_I}). Table 3 is drawn up in increasing order of the median value of γ_{a_I}. Focusing on the average distribution across industries, the price-cost mark-up (μ_{a_I}) is computed to be lower than 1.17 for the first quartile of industries and higher than 1.29 for the top quartile. The corresponding extent of rent sharing (ϕ_{a_I}) is lower than 0.21 for the first quartile of industries and exceeds 0.48 for the upper quartile.

<Insert Table 3 about here>

3.2.3 Traditional labor economics approach

The profit per worker variable $(\frac{\pi_{it}}{N_{it}})$ varies a lot over time. When estimating Eq. (16) for each industry I, we use the average of the profit per worker variable from time t until $(t-4)$ as the main independent variable and assume that the outside wage is entirely captured by year effects.[3] Table 4 presents the results of estimating the wage equation. The left part uses the average net nominal wage per worker $(w_{j(i)t})$ as the dependent variable whereas the right part uses the firm average wage per worker (w_{it}) as the dependent variable.[4] In Table A.2 in Appendix we additionally present the results using the firm average wage per worker computed on the basis of the worker information $\left(\frac{\sum_{j\in i} w_{j(i)t}}{\sum_{j\in i} j}\right)$ as the dependent variable.[5] Within each part, the first column reports the estimated profits-wage elasticity $(\varepsilon^{\pi}_{w_I})$, the second column derives the corresponding relative extent of rent sharing (γ_I) by multiplying the estimated elasticity by the

[3] Since the firm dataset covers the period 1978-2001, we also use the information over the period 1978-1984 to compute our smooth profit per worker measure.

[4] When using the worker wage as the dependent variable, the specification tests are never passed. On the contrary, when using the firm-average wage per worker as the dependent variable, the specification tests are passed in 35 out of the 38 cases. Results not reported but available upon request.

[5] Table A.2 is drawn up in increasing order of $\widehat{\gamma}_I$ using the average net nominal wage per worker $(w_{j(i)t})$ as the dependent variable (see Table 4). The specification tests are passed in 37 out of the 38 cases.

ratio of the firm-average wage per worker to the profit per worker,[6] and the third column gives the corresponding extent of rent sharing (ϕ_I). The table is drawn up in increasing order of $\widehat{\gamma}_I$ using the average net nominal wage per worker ($w_{j(i)t}$) as the dependent variable.

Focusing on the left part, except for one industry, the profits-wage elasticity is estimated to be positive. Th elasticitiy is estimated to be lower than 0.06 for the first quartile of industries and higher than 0.15 for the upper quartile. These elasticities are in line with previous studies (see Christofides and Oswald, 1992; Blanchflower et al., 1996; Hildreth and Oswald, 1997; Arai, 2003). The corresponding extent of rent sharing is lower than 0.10 for the first quartile of industries and exceeds 0.24 for the top quartile. Comparing these estimates with the right part reveals that the estimated elasticities and the derived extent of rent-sharing parameters using the firm-average wage per worker as the dependent variable are consistent with the ones using the worker wage as the dependent variable. The former elasticity is estimated to be lower than 0.14 for the first quartile of industries and higher than 0.25 for the upper quartile.

<Insert Table 4 about here>

4 A comparison of the three different approaches

In this section, we compare consistently estimates of rent sharing across the three different approaches. Table 5 presents the distribution of our parameter of interest across the three approaches. For the traditional labor economics approach, we compute the relative extent of rent-sharing parameters by multiplying the estimated profits-wage elasticities by the median value of the smooth ratio of the firm-average wage per worker to the profit per worker at the industry level. Likewise, we focus on the median values of the accounting (relative) extent of rent sharing. The upper part of Table 5 shows the GMM results, the lower part gives the OLS results. For each estimator, we consider (i) all industries and (ii) a subsample of industries for which the relative extent of rent-sharing parameters are estimated (or computed) to be positive across the different approaches.[7] This subsample contains 20 industries when focusing on the GMM results and 22 industries when considering the OLS results. The left part of Table 5 displays the distribution of the relative extent of rent-sharing parameters whereas the right part gives the distribution of the rent-sharing parameter.

[6]Consistent with the smooth profit per worker measure, we compute the average of this ratio from time t until $(t-4)$.

[7]To define this subsample, we require that the estimated (or computed) relative extent of rent sharing parameters are positive across the different approaches and additionally for each of the three variants of the traditional labor economics approach, i.e. for the wage equation using the worker wage ($w_{j(i)t}$) and the two firm-average wage per worker (w_{it}) and $\left(\frac{\sum_{j\in i} w_{j(i)t}}{\sum_{j\in i} j}\right)$. The results of the latter are presented in Table A.2 in Appendix.

Focusing on the upper-right part of the table and on the 38 industries, we observe the most sizeable dispersion in the estimated extent of rent-sharing parameter ($\widehat{\phi}_I$) within the productivity approach whereas the lowest dispersion is observed within the accounting approach. The two variants of the traditional labor economics approach display a comparable dispersion. Restricting the sample to the economically meaningful parameter estimates reveals that the differences in dispersion across the different approaches become smaller but more importantly that the rent-sharing estimates are within a comparable range. Concentrating at the median values, we find that these estimates lie in the $[0.22, 0.33]-$range. As could be expected, the OLS estimates of rent-sharing are lower compared to the GMM estimates and display a larger discrepancy across the three approaches. As a graphical illustration, Figure 1 presents the box diagrams for the subsample of the economically meaningful rent-sharing estimates. The upper diagram displays the GMM estimates whereas the lower diagram shows the OLS estimates.

Table A.3 in Appendix presents the correlation between the estimates of (relative) exent of rent sharing across the three approaches. Consistent with the discussion above, we consider the full sample and a subsample. Considering the economically meaningful parameter estimates, the correlation between the (relative) extent of rent sharing appears to be between 0.20 and 0.58 across the different approaches. As a graphical illustration, Figure A.1 in Appendix plots the GMM results (economically meaningful parameter estimates) of (i) the accounting extent of rent sharing versus the estimated extent of rent sharing using the traditional labor economics approach (worker wage), (ii) the estimated extent of rent sharing using the productivity approach versus the estimated extent of rent sharing using the traditional labor economics approach (worker wage) and (iii) the estimated extent of rent sharing using the traditional labor economics approach (firm wage) versus the estimated extent of rent sharing using the traditional labor economics approach (worker wage). The dashed lines denote the median values.

5 Conclusion

This article provides evidence of rent sharing from orthogonal directions. Taking advantage of a rich matched employer-employee dataset for France, we compare consistently across-industry heterogeneity in rent-sharing parameters relying on three different approaches: (i) the productivity approach, (ii) the accounting approach and (ii) the traditional labor economics approach. We presume that all three approaches rely on the same underlying rent-sharing model, i.e. the efficient bargaining model. Restricting the analysis to the economically meaningful estimates of rent sharing, our main results reveal that there are differences in dispersion of the estimates of rent sharing across the three different approaches. However, it is reassuring to find that the rent-sharing estimates across the three different approaches are within a comparable range. Concentrating at the median values, we find that these estimates lie in the $[0.22, 0.33]$-interval.

References

[1] Abowd, J.M., F. Kramarz and D. Margolis, 1999, High wage workers and high wage firms, Econometrica, 67(2), 251-334.

[2] Abowd, J.M. and T. Lemieux, 1993, The effects of product market competition on collective bargaining agreements: The case of foreign competition in Canada, The Quarterly Journal of Economics, 108(4), 983-1014.

[3] Arai, M., 2003, Wages, profits, and capital intensity: Evidence from matched worker-firm data, Journal of Labor Economics, 21(3), 593-618.

[4] Arellano, M. and S. Bond, 1991, Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, Review of Economic Studies, 58(2), 277-297.

[5] Blanchflower, D.G., A.J. Oswald and M. D. Garrett, 1990, Insider power in wage determination, Economica, 57, 143-170.

[6] Blanchflower, D.G., A.J. Oswald and P. Sanfey, 1996, Wages, profits and rent sharing, The Quarterly Journal of Economics, 111, 227-252.

[7] Boulhol, H. and S. Dobbelaere, 2006, Imports as product and labor market discipline, IZA Discussion Paper 2178, Institute for the Study of Labor, Bonn.

[8] Christofides, L.N and A.J. Oswald, 1992, Real wage determination and rent sharing in collective bargaining agreements, The Quarterly Journal of Economics, 107, 985-1002.

[9] Dobbelaere, S. and J. Mairesse, 2008, Panel data estimates of the production function and product and labor market imperfections, NBER Working Paper 13975, National Bureau of Economic Research.

[10] Estevao, M. and S. Tevlin, 2003, Do firms share their success with workers? The response of wages to product market conditions, Economica, 70(280), 597-617.

[11] Hall, R.E., 1988, The relationship between price and marginal cost in US industry, Journal of Political Economy, 96(5), 921-947.

[12] Hildreth, A.K.G. and A.J. Oswald, 1997, Rent sharing and wages: Evidence from company and establishment panels, Journal of Labor Economics, 15, 318-337.

[13] Holmlund, B. and J. Zetterberg, 1991, Insider effects in wage determination, European Economic Review, 35, 1009-1035.

[14] Jovanovic, B., 1979, Job matching and the theory of turnover, Journal of Political Economy, 87(5), 972-990.

[15] Katz, L.F. and L.H. Summers, 1989, Industry rents: Evidence and implications, Brookings Papers on Economic Activity: Microeconomics, 209-275.

[16] Kramarz, F., 2003, Wages and international trade, CREST, mimeo.

[17] Lazear, E.P. and S. Rosen, 1981, Rank-order tournaments as optimal labor contracts, Journal of Political Economy, 89(5), 841-864.

[18] Margolis, D.N. and K. Salvanes, 2001, Do firms really share rents with their employees?, IZA Discussion Paper 330, Institute for the Study of Labor.

[19] Martins, P.S., 2007, Rent sharing before and after the wage bill, IZA Discussion Paper 0405, Institute for the Study of Labor.

[20] McDonald, I.M. and R.M. Solow, 1981, Wage bargaining and employment, American Economic Review, 71(5), 896-908.

[21] Mortensen, D., 2003, Wage dispersion: Why are similar workers paid differently?, Cambridge, MA: MIT Press.

[22] Nickell, S.J. and M. Andrews, 1983, Unions, real wages and employment in Britain 1951-79, Oxford Economic Papers, 35(supp), 183-205.

[23] Nickell, S.J., J. Vainiomaki and S. Wadhwani, 1994, Wages and product market power, Economica, 61, 457-473.

[24] Postel-Vinay, F. and J.M. Robin, 2002, Equilibrium wage dispersion with worker and employer heterogeneity, Econometrica, 70(6), 2295-2350.

[25] Roodman, D., 2005, xtabond2: Stata Module to Extend xtabond Dynamic Panel Data Estimator. Center for Global Development, Washington.

[26] Shimer, R., 2005, The assignment of workers to jobs in an economy with coordination frictions, Journal of Political Economy, 113(5), 996-1025.

[27] Veugelers, R., 1989, Wage premia, price cost margins and bargaining power in Belgian manufacturing, European Economic Review, 33(1), 169-180.

Table 1
Summary statistics

Variables	1984-2001					
	Mean	Sd.	Q_1	Q_2	Q_3	N
Real firm output growth rate Δq_{it}	0.026	0.152	-0.055	0.024	0.108	125528
Labor growth rate Δn_{it}	0.007	0.123	-0.042	0.000	0.055	125528
Capital growth rate Δk_{it}	0.001	0.152	-0.072	-0.017	0.065	125528
Materials growth rate Δm_{it}	0.041	0.193	-0.060	0.038	0.141	125528
Labor share in nominal output $\alpha_{N_{it}}$	0.310	0.135	0.214	0.295	0.389	132552
Materials share in nominal output $\alpha_{M_{it}}$	0.517	0.155	0.420	0.524	0.624	132552
$\Delta q_{it} - \Delta k_{it}$	0.026	0.189	-0.077	0.027	0.129	125528
$\Delta n_{it} - \Delta k_{it}$	0.006	0.165	-0.075	0.012	0.087	125528
$\Delta m_{it} - \Delta k_{it}$	0.040	0.221	-0.081	0.039	0.159	125528
Profit per worker $\frac{\pi_{it}}{N_{it}}$	21592	30658	6761	13529	25839	132552
Firm-average wage per worker w_{it}	28346	8453	22480	27220	32817	132552
Number of workers per firm $\sum_{j \in i} j$	10	55	2	3	7	9121
Average wage per worker $w_{j(i)t}$	17199	9237	11650	14794	19553	719693

Table 2
Productivity approach: Industry analysis: Estimated industry-level mark-up $\hat{\mu}_I$ (*only*) and extent of rent sharing $\hat{\phi}_I$

		GMM SYS $(t-2)(t-3)$			
Industry	# Firms	$\hat{\mu}_I$ *only*	$\hat{\mu}_I$	$\hat{\gamma}_I$	$\hat{\phi}_I$
Ind 1	276	0.966 (0.066)	0.841 (0.014)	-1.289 (0.420)	-4.460 (5.032)
Ind 3	96	1.254 (0.062)	1.047 (0.021)	-0.792 (0.232)	-3.811 (5.367)
Ind 32	149	1.126 (0.042)	1.014 (0.019)	-0.410 (0.314)	-0.696 (0.902)
Ind 10	102	1.244 (0.039)	1.111 (0.028)	-0.405 (0.350)	-0.682 (0.990)
Ind 17	136	1.089 (0.030)	1.039 (0.028)	-0.347 (0.583)	-0.531 (1.365)
Ind 19	159	1.239 (0.036)	1.142 (0.023)	-0.341 (0.518)	-0.517 (1.191)
Ind 25	93	1.073 (0.063)	0.968 (0.027)	-0.309 (0.413)	-0.448 (0.865)
Ind 4	105	1.265 (0.047)	1.180 (0.031)	-0.287 (0.246)	-0.402 (0.484)
Ind 14	117	1.134 (0.031)	1.058 (0.033)	-0.282 (0.383)	-0.394 (0.743)
Ind 9	125	1.326 (0.047)	1.215 (0.015)	-0.260 (0.293)	-0.351 (0.535)
Ind 21	133	1.198 (0.0483)	1.165 (0.028)	-0.143 (0.470)	-0.167 (0.641)
Ind 20	234	1.226 (0.035)	1.189 (0.020)	-0.113 (0.456)	-0.127 (0.580)
Ind 29	360	1.237 (0.031)	1.211 (0.014)	-0.043 (0.170)	-0.045 (0.185)
Ind 38	289	1.083 (0.033)	1.059 (0.016)	-0.020 (0.303)	-0.021 (0.316)
Ind 34	116	1.255 (0.047)	1.208 (0.021)	-0.012 (0.247)	-0.012 (0.253)
Ind 2	109	1.120 (0.050)	1.090 (0.016)	-0.007 (0.280)	-0.007 (0.284)
Ind 15	122	1.238 (0.036)	1.231 (0.017)	0.104 (0.274)	0.094 (0.225)
Ind 23	160	1.192 (0.049)	1.232 (0.019)	0.139 (0.362)	0.122 (0.279)
Ind 30	288	1.266 (0.033)	1.307 (0.015)	0.176 (0.119)	0.150 (0.086)
Ind 33	521	1.148 (0.025)	1.196 (0.014)	0.209 (0.234)	0.173 (0.160)
Ind 13	138	1.258 (0.063)	1.281 (0.029)	0.256 (0.249)	0.204 (0158)
Ind 31	180	1.136 (0.036)	1.210 (0.014)	0.285 (0.226)	0.222 (0.137)
Ind 28	277	1.207 (0.036)	1.213 (0.015)	0.333 (0.394)	0.250 (0.222)
Ind 7	186	1.160 (0.055)	1.194 (0.023)	0.368 (0.342)	0.269 (0.183)
Ind 24	159	1.156 (0.033)	1.266 (0.013)	0.374 (0.161)	0.272 (0.085)
Ind 11	286	1.261 (0.038)	1.303 (0.017)	0.407 (0.320)	0.289 (0.162)
Ind 5	427	1.126 (0.033)	1.231 (0.011)	0.458 (0.105)	0.314 (0.049)
Ind 36	812	1.139 (0.018)	1.238 (0.011)	0.466 (0.156)	0.318 (0.072)
Ind 26	334	1.228 (0.049)	1.393 (0.015)	0.499 (0.157)	0.333 (0.070)
Ind 35	126	1.246 (0.032)	1.333 (0.018)	0.563 (0.182)	0.360 (0.074)
Ind 37	518	1.260 (0.029)	1.473 (0.014)	0.668 (0.158)	0.400 (0.057)
Ind 12	163	1.285 (0.036)	1.442 (0.016)	0.742 (0.205)	0.426 (0.068)
Ind 18	247	1.106 (0.021)	1.209 (0.015)	0.775 (0.306	0.437 (0.097)
Ind 8	618	1.246 (0.020)	1.428 (0.008)	0.795 (0.143)	0.443 (0.045)
Ind 27	235	1.162 (0.027)	1.257 (0.011)	0.832 (0.356)	0.454 (0.106)
Ind 22	237	1.091 (0.032)	1.239 (0.012)	0.920 (0.295)	0.479 (0.080)
Ind 16	100	1.209 (0.040)	1.338 (0.018)	0.956 (0.268)	0.489 (0.070)
Ind 6	388	1.182 (0.033)	1.271 (0.009)	1.062 (0.209)	0.515 (0.049)
Mean	**240**	**1.188 (0.039)**	**1.206 (0.018)**	**0.166 (0.287)**	**0.086 (0.586)**
Median	**172**	**1.202 (0.036)**	**1.212 (0.016)**	**0.193 (0.277)**	**0.188 (0.184)**

Time dummies are included but not reported. First-step robust standard errors in parentheses.

(1) Instruments used: the lagged levels of q n, m and k dated $(t-2)$ and $(t-3)$ in the first-differenced equations and the lagged first-differences of q, n, m and k dated $(t-1)$ in the levels equations.

Table 3
Accounting approach: Industry analysis:
Distribution of industry-level mark-up μ_{a_I} (*only*) and extent of rent sharing ϕ_{a_I}

	$\mu\ only_{a_I}$			μ_{a_I}			γ_{a_I}			ϕ_{a_I}		
Industry	Q_1	Q_2	Q_3	Q_1	Q_2	Q_3	Q_1	Q_2	Q_3	Q_1	Q_2	Q_3
Ind 4	1.110	1.159	1.218	1.137	1.198	1.251	0.085	0.350	0.085	0.086	0.171	0.244
Ind 2	1.089	1.129	1.173	1.114	1.159	1.205	0.063	0.379	0.063	0.080	0.186	0.280
Ind 3	1.136	1.207	1.272	1.200	1.260	1.327	0.121	0.395	0.121	0.130	0.186	0.277
Ind 30	1.155	1.189	1.228	1.213	1.250	1.298	0.191	0.453	0.191	0.171	0.240	0.313
Ind 34	1.126	1.157	1.224	1.176	1.222	1.290	0.171	0.509	0.171	0.163	0.266	0.357
Ind 24	1.175	1.220	1.274	1.235	1.295	1.351	0.143	0.543	0.143	0.138	0.246	0.341
Ind 15	1.127	1.164	1.217	1.180	1.229	1.291	0.153	0.599	0.153	0.147	0.253	0.363
Ind 23	1.101	1.158	1.233	1.213	1.272	1.146	-0.047	0.872	-0.047	0.156	0.371	0.657
Ind 32	1.128	1.179	1.254	1.193	1.249	1.319	0.180	0.710	0.180	0.153	0.267	0.365
Ind 29	1.145	1.173	1.213	1.201	1.235	1.283	0.202	0.537	0.202	0.177	0.257	0.337
Ind 1	1.087	1.117	1.208	1.117	1.160	1.271	0.143	0.632	0.143	0.151	0.272	0.426
Ind 26	1.137	1.193	1.265	1.200	1.265	1.355	0.191	0.690	0.191	0.188	0.280	0.397
Ind 31	1.117	1.161	1.225	1.183	1.232	1.304	0.172	0.723	0.172	0.208	0.312	0.413
Ind 33	1.108	1.145	1.199	1.172	1.219	1.275	0.193	0.781	0.193	0.199	0.315	0.439
Ind 37	1.145	1.185	1.247	1.218	1.281	1.360	0.231	0.719	0.231	0.189	0.305	0.413
Ind 10	1.127	1.175	1.221	1.204	1.262	1.322	0.234	0.955	0.234	0.210	0.330	0.491
Ind 19	1.084	1.135	1.222	1.159	1.222	1.316	0.167	0.949	0.167	0.201	0.352	0.536
Ind 14	1.101	1.129	1.197	1.164	1.201	1.259	0.191	0.809	0.191	0.216	0.325	0.466
Ind 9	1.141	1.192	1.254	1.221	1.284	1.344	0.254	0.694	0.254	0.211	0.299	0.427
Ind 5	1.105	1.142	1.228	1.176	1.232	1.315	0.205	0.898	0.205	0.191	0.317	0.460
Ind 13	1.104	1.164	1.254	1.201	1.256	1.341	0.265	0.913	0.265	0.215	0.331	0.524
Ind 38	1.087	1.128	1.196	1.179	1.232	1.299	0.061	1.008	0.061	0.267	0.447	0.631
Ind 25	1.109	1.159	1.250	1.186	1.255	1.365	0.127	0.766	0.127	0.265	0.336	0.494
Ind 7	1.106	1.145	1.194	1.173	1.214	1.278	0.198	0.825	0.198	0.195	0.324	0.460
Ind 22	1.073	1.109	1.174	1.165	1.209	1.283	0.174	1.341	0.174	0.223	0.434	0.601
Ind 20	1.073	1.098	1.159	1.151	1.187	1.250	0.194	1.226	0.194	0.235	0.435	0.598
Ind 17	1.067	1.086	1.134	1.125	1.152	1.213	0.234	1.116	0.234	0.235	0.392	0.589
Ind 35	1.121	1.140	1.178	1.171	1.217	1.252	0.257	0.865	0.257	0.243	0.326	0.434
Ind 27	1.082	1.118	1.176	1.143	1.190	1.276	0.217	1.019	0.217	0.236	0.389	0.560
Ind 12	1.105	1.148	1.198	1.184	1.240	1.298	0.215	0.958	0.215	0.246	0.364	0.508
Ind 8	1.110	1.146	1.189	1.202	1.254	1.311	0.183	1.278	0.183	0.268	0.430	0.578
Ind 11	1.095	1.124	1.171	1.171	1.213	1.270	0.306	1.101	0.306	0.274	0.388	0.534
Ind 21	1.076	1.104	1.161	1.143	1.187	1.263	0.095	1.117	0.095	0.257	0.419	0.563
Ind 36	1.120	1.147	1.185	1.198	1.244	1.301	0.321	1.056	0.321	0.264	0.395	0.517
Ind 16	1.071	1.103	1.147	1.160	1.213	1.276	0.042	1.370	0.042	0.313	0.529	0.707
Ind 6	1.094	1.121	1.170	1.180	1.223	1.283	0.319	1.313	0.319	0.292	0.445	0.575
Ind 28	1.083	1.122	1.179	1.176	1.227	1.298	0.179	1.292	0.179	0.296	0.450	0.606
Ind 18	1.063	1.086	1.122	1.148	1.189	1.230	0.220	1.842	0.220	0.341	0.530	0.692
Mean	**1.107**	**1.146**	**1.205**	**1.177**	**1.227**	**1.294**	**0.183**	**0.456**	**0.884**	**0.211**	**0.340**	**0.478**
Median	**1.106**	**1.145**	**1.204**	**1.177**	**1.228**	**1.294**	**0.191**	**0.454**	**0.868**	**0.210**	**0.328**	**0.478**

Table 4
Labor economics approach: Industry analysis:
Estimated industry-level profits-wage elasticity $\varepsilon^{\pi}_{w_I}$ and extent of rent sharing ϕ_I

	GMM SYS $(t-2)(t-3)$					
	WORKER			*FIRM*		
Industry	$\varepsilon^{\pi}_{w_I}$	γ_I	ϕ_I	$\varepsilon^{\pi}_{w_I}$	γ_I	ϕ_I
Ind 19	0.083 (0.018)	-0.235	-0.307	0.071 (0.033)	-1.044	23.73
Ind 17	-0.018 (0.026)	-0.063	-0.067	-0.0002 (0.027)	-0.001	-0.001
Ind 16	0.039 (0.011)	0.020	0.020	0.134 (0.050)	0.463	0.316
Ind 14	0.021 (0.007)	0.021	0.020	0.131 (0.029)	0.372	0.271
Ind 13	0.022 (0.035)	0.047	0.045	0.053 (0.031)	0.144	0.126
Ind 2	0.061 (0.024)	0.058	0.055	0.077 (0.036)	0.087	0.080
Ind 22	0.019 (0.015)	0.061	0.058	0.048 (0.028)	0.210	0.174
Ind 10	0.045 (0.021)	0.074	0.069	0.098 (0.047)	0.181	0.154
Ind 12	0.046 (0.021)	0.098	0.089	0.113 (0.033)	0.317	0.240
Ind 34	0.065 (0.017)	0.108	0.098	0.045 (0.037)	0.073	0.068
Ind 15	0.095 (0.014)	0.109	0.099	0.100 (0.031)	0.142	0.124
Ind 1	0.076 (0.024)	0.121	0.108	0.088 (0.026)	0.170	0.145
Ind 3	0.144 (0.018)	0.121	0.108	0.198 (0.040)	0.219	0.179
Ind 21	0.049 (0.023)	0.132	0.117	0.048 (0.029)	0.147	0.128
Ind 9	0.101 (0.024)	0.134	0.118	0.132 (0.040)	0.200	0.167
Ind 24	0.118 (0.041)	0.160	0.138	0.152 (0.042)	0.231	0.188
Ind 29	0.108 (0.042)	0.164	0.141	0.185 (0.040)	0.299	0.230
Ind 4	0.246 (0.053)	0.181	0.153	0.046 (0.042)	0.043	0.041
Ind 30	0.168 (0.024)	0.196	0.164	0.123 (0.028)	0.166	0.142
Ind 11	0.095 (0.027)	0.121	0.175	0.061 (0.027)	0.179	0.152
Ind 23	0.105 (0.008)	0.220	0.180	0.068 (0.022)	0.329	0.248
Ind 28	0.095 (0.022)	0.236	0.191	0.144 (0.031)	0.461	0.315
Ind 20	0.092 (0.022)	0.266	0.210	0.059 (0.026)	0.223	0.182
Ind 38	0.134 (0.011)	0.271	0.213	0.102 (0.022)	0.284	0.221
Ind 5	0.210 (0.016)	0.288	0.224	0.150 (0.021)	0.330	0.248
Ind 32	0.197 (0.028)	0.289	0.224	0.104 (0.043)	0.176	0.149
Ind 33	0.150 (0.026)	0.293	0.227	0.074 (0.028)	0.168	0.144
Ind 25	0.191 (0.018)	0.299	0.230	0.156 (0.030)	0.353	0.261
Ind 36	0.124 (0.031)	0.308	0.236	-0.022 (0.027)	-0.054	-0.057
Ind 7	0.154 (0.023)	0.316	0.240	0.137 (0.035)	0.357	0.263
Ind 8	0.113 (0.023)	0.317	0.241	0.099 (0.038)	0.274	0.215
Ind 37	0.180 (0.026)	0.323	0.244	0.111 (0.033)	0.223	0.183
Ind 6	0.108 (0.021)	0.337	0.252	0.236 (0.023)	0.940	0.485
Ind 31	0.190 (0.009)	0.337	0.252	0.162 (0.031)	0.297	0.229
Ind 27	0.140 (0.026)	0.349	0.259	0.126 (0.030)	0.354	0.262
Ind 26	0.223 (0.019)	0.362	0.266	0.104 (0.024)	0.190	0.160
Ind 35	0.135 (0.024)	0.435	0.303	0.104 (0.035)	0.407	0.289
Ind 18	0.175 (0.013)	0.835	0.455	0.053 (0.025)	0.282	0.220
Mean	**0.113 (0.022)**	**0.205**	**0.154**	**0.102 (0.032)**	**0.216**	**0.807**
Median	**0.108 (0.022)**	**0.204**	**0.169**	**0.103 (0.031)**	**0.221**	**0.183**

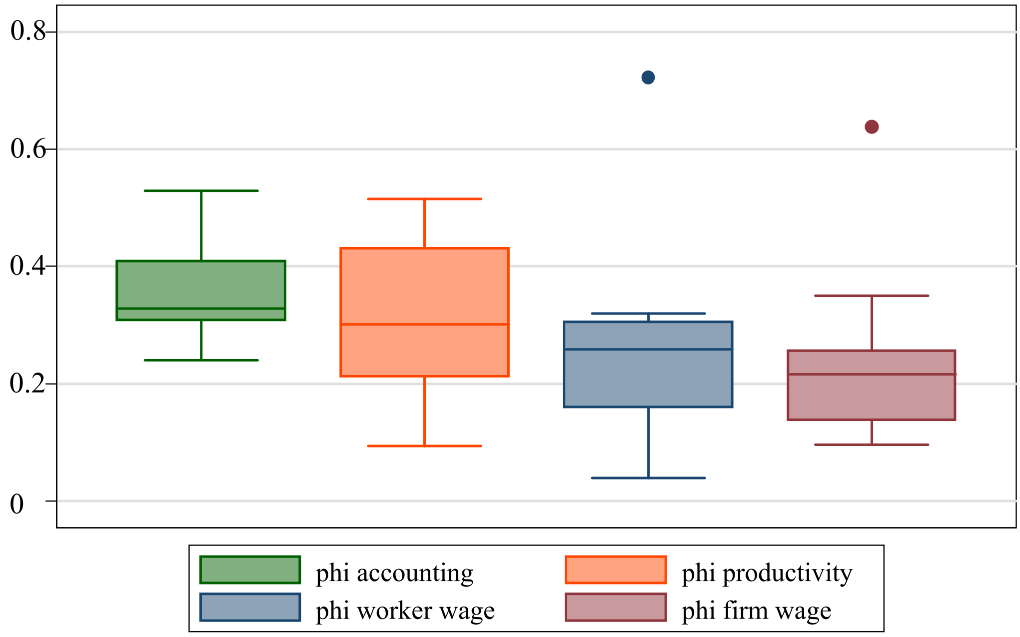
Time dummies are included but not reported. First-step robust standard errors in parentheses.

(1) Instruments used: the lagged levels of q n, m and k dated $(t-2)$ and $(t-3)$ in the first-differenced equations and the lagged first-differences of q, n, m and k dated $(t-1)$ in the levels equations.

Table 5
Comparison of distribution of (relative) extent of rent sharing γ_I (ϕ_I) across the three approaches

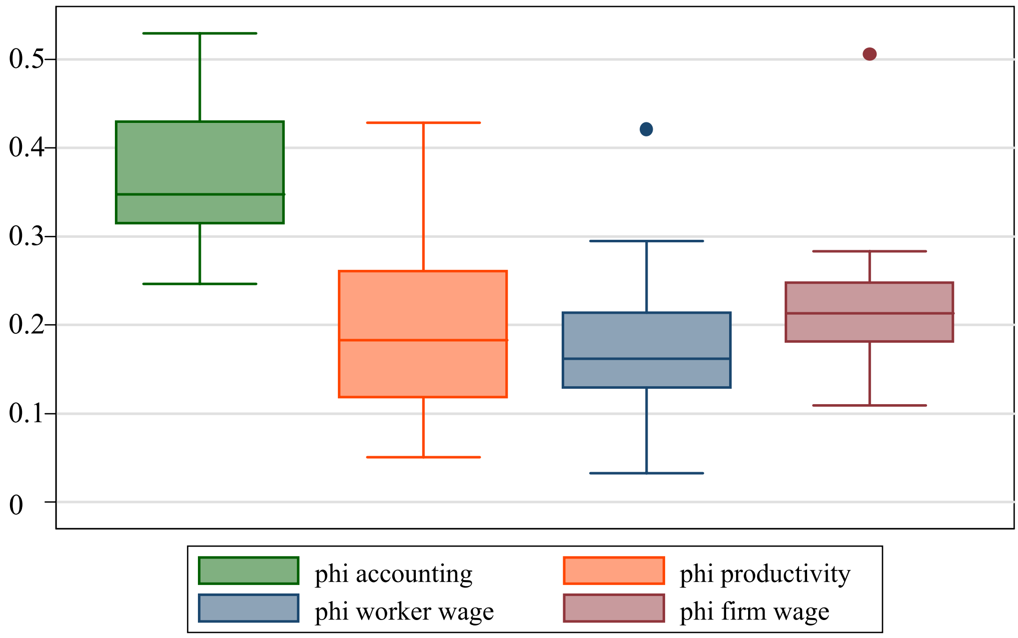
	GMM SYS $(t-2)(t-3)$					**GMM SYS** $(t-2)(t-3)$				
# Ind.	Estimate	Mean	Q_1	Q_2	Q_3	Estimate	Mean	Q_1	Q_2	Q_3
38	Accounting γ_{a_I}	0.456	0.347	0.454	0.532	Accounting ϕ_{a_I}	0.339	0.271	0.327	0.395
38	Productivity $\widehat{\gamma}_I$	0.166	-0.260	0.193	0.499	Productivity $\widehat{\phi}_I$	0.086	-0.167	0.188	0.360
38	Wage worker $\widehat{\gamma}_I$	0.201	0.108	0.193	0.293	Wage worker $\widehat{\phi}_I$	0.201	0.108	0.193	0.293
38	Wage firm $\widehat{\gamma}_I$	0.182	0.133	0.160	0.239	Wage firm $\widehat{\phi}_I$	0.182	0.133	0.160	0.239
20	Accounting γ_{a_I}	0.493	0.374	0.459	0.579	Accounting ϕ_{a_I}	0.357	0.308	0.328	0.409
20	Productivity $\widehat{\gamma}_I$	0.500	0.271	0.432	0.758	Productivity $\widehat{\phi}_I$	0.311	0.213	0.302	0.431
20	Wage worker $\widehat{\gamma}_I$	0.249	0.159	0.258	0.306	Wage worker $\widehat{\phi}_I$	0.249	0.159	0.258	0.306
20	Wage firm $\widehat{\gamma}_I$	0.226	0.139	0.216	0.256	Wage firm $\widehat{\phi}_I$	0.226	0.139	0.216	0.256
	OLS lev					**OLS lev**				
38	Accounting γ_{a_I}	0.456	0.347	0.454	0.532	Accounting ϕ_{a_I}	0.340	0.272	0.328	0.395
38	Productivity $\widehat{\gamma}_I$	0.033	-0.146	0.100	0.250	Productivity $\widehat{\phi}_I$	0.068	-0.115	0.108	0.208
38	Wage worker $\widehat{\gamma}_I$	0.151	0.090	0.140	0.193	Wage worker $\widehat{\phi}_I$	0.151	0.090	0.140	0.193
38	Wage firm $\widehat{\gamma}_I$	0.198	0.149	0.200	0.231	Wage firm $\widehat{\phi}_I$	0.198	0.149	0.200	0.231
22	Accounting γ_{a_I}	0.493	0.439	0.460	0.569	Accounting ϕ_{a_I}	0.368	0.315	0.347	0.429
22	Productivity $\widehat{\gamma}_I$	0.271	0.134	0.225	0.214	Productivity $\widehat{\phi}_I$	0.198	0.118	0.183	0.261
22	Wage worker $\widehat{\gamma}_I$	0.221	0.181	0.213	0.248	Wage worker $\widehat{\phi}_I$	0.171	0.130	0.162	0.214
22	Wage firm $\widehat{\gamma}_I$	0.226	0.139	0.216	0.256	Wage firm $\widehat{\phi}_I$	0.221	0.181	0.213	0.248

Fig. 1a: GMM estimates of rent-sharing across the three approaches



Source: Own estimates

Fig. 1b: OLS estimates of rent-sharing across the three approaches



Source: Own estimates

Appendix: Detailed results

Table A.1
Industry repartition

Industry	Code	Name	# Firms	# Workers	# Obs. Firm dataset	# Obs. Matched firm-worker dataset
Ind 1	B01	Meat preparations	276	2006	3913	13514
Ind 2	B02	Milk products	109	1716	1603	13269
Ind 3	B03	Beverages	96	1297	1390	10118
Ind 4	B04	Food production for animals	105	721	1516	5479
Ind 5	B05-B06	Other food products	427	3492	6153	26601
Ind 6	C11	Clothing and skin goods	388	2407	5333	17234
Ind 7	C12	Leather goods and footwear	186	1328	2680	10471
Ind 8	C20	Publishing, (re)printing	618	3427	8834	25286
Ind 9	C31	Pharmaceutical products	125	2738	1779	20113
Ind 10	C32	Soap, perfume and maintenance products	102	1699	1518	13583
Ind 11	C41	Furniture	286	2001	4189	16353
Ind 12	C42, C44-C46	Accommodation equipment	163	1892	2370	15976
Ind 13	C43	Sport articles, games and other products	138	913	1942	6938
Ind 14	D01	Motor vehicles	117	9342	1725	77448
Ind 15	D02	Transport equipment	122	2788	1848	21494
Ind 16	E11-E14	Ship building, aircraft and railway construction	100	3793	1492	26316
Ind 17	E21	Metal products for construction	136	669	1956	4679
Ind 18	E22	Ferruginous and steam boilers	247	1610	3609	11364
Ind 19	E23	Mechanical equipment	159	2027	2412	16898
Ind 20	E24	Machinery for general usage	234	1942	3367	15490
Ind 21	E25-E26	Agriculture machinery	133	752	1910	5696
Ind 22	E27-E28	Other machinery for specific usage	237	1598	3425	12955
Ind 23	E31-E35	Electric and electronic machinery	160	2381	2289	15450
Ind 24	F11-F12	Mineral products	159	641	2332	4763
Ind 25	F13	Glass products	93	1916	1382	17855
Ind 26	F14	Earthenware products and construction material	334	2824	4878	21471
Ind 27	F21	Textile art	235	1940	3322	13583
Ind 28	F22-F23	Textile products and clothing	277	2227	3943	16788
Ind 29	F31	Wooden products	360	1317	5267	10579
Ind 30	F32-F33	Paper and printing products	288	2692	4247	22810
Ind 31	F41-F42	Mineral and organic chemical products	180	5338	2718	52625
Ind 32	F43-F45	Parachemical and rubber products	149	1780	2216	13824
Ind 33	F46	Transformation of plastic products	521	3233	7710	25874
Ind 34	F51-F52	Steel products, non-ferrous metals	116	2746	1704	22452
Ind 35	F53	Ironware	126	1120	1887	9277
Ind 36	F54	Industrial service to metal products	812	2925	11880	22946
Ind 37	F55-F56	Metal products, recuperation	518	3277	7563	25843
Ind 38	F61-F62	Electrical goods and components	289	4838	4250	36278

Table A.2

Labor economics approach: Wage equation using $\left(\frac{\sum_{j\in i} w_{j(i)t}}{\sum_{j\in i} j}\right)$ as the firm-average wage per worker

Industry analysis: Estimated industry-level profits-wage elasticity $\varepsilon^{\pi}_{w_I}$ and extent of rent sharing ϕ_I

	GMM SYS $(t-2)(t-3)$		
	FIRM		
Industry	$\varepsilon^{\pi}_{w_I}$	γ_I	ϕ_I
Ind 19	0.065 (0.034)	-0.970	-31.895
Ind 17	-0.015 (0.044)	-0.055	-0.058
Ind 16	0.114 (0.060)	0.394	0.283
Ind 14	0.037 (0.038)	0.372	0.095
Ind 13	0.096 (0.058)	0.258	0.205
Ind 2	0.104 (0.053)	0.117	0.105
Ind 22	-0.041 (0.043)	-0.179	-0.219
Ind 10	0.053 (0.066)	0.099	0.090
Ind 12	0.098 (0.057)	0.276	0.216
Ind 34	0.033 (0.047)	0.055	0.052
Ind 15	0.087 (0.041)	0.124	0.110
Ind 1	0.118 (0.047)	0.227	0.185
Ind 3	0.205 (0.055)	0.227	0.185
Ind 21	0.088 (0.039)	0.270	0.212
Ind 9	0.085 (0.062)	0.128	0.114
Ind 24	0.122 (0.064)	0.186	0.157
Ind 29	0.134 (0.063)	0.217	0.178
Ind 4	-0.005 (0.050)	-0.005	-0.005
Ind 30	0.156 (0.052)	0.211	0.174
Ind 11	0.072 (0.044)	0.211	0.174
Ind 23	0.068 (0.037)	0.327	0.247
Ind 28	0.024 (0.045)	0.078	0.072
Ind 20	0.099 (0.035)	0.373	0.272
Ind 38	0.112 (0.035)	0.313	0.238
Ind 5	0.099 (0.039)	0.218	0.179
Ind 32	0.134 (0.062)	0.227	0.185
Ind 33	0.140 (0.046)	0.319	0.242
Ind 25	0.058 (0.045)	0.131	0.116
Ind 36	0.114 (0.045)	0.283	0.221
Ind 7	0.073 (0.050)	0.190	0.159
Ind 8	0.055 (0.059)	0.152	0.132
Ind 37	0.182 (0.064)	0.365	0.267
Ind 6	0.153 (0.026)	0.609	0.379
Ind 31	0.183 (0.047)	0.337	0.252
Ind 27	0.058 (0.048)	0.164	0.141
Ind 26	0.131 (0.036)	0.241	0.194
Ind 35	0.085 (0.050)	0.333	0.250
Ind 18	0.007 (0.049)	0.038	0.036
Mean	**0.089 (0.048)**	**0.173**	**-0.686**
Median	**0.092 (0.047)**	**0.214**	**0.176**

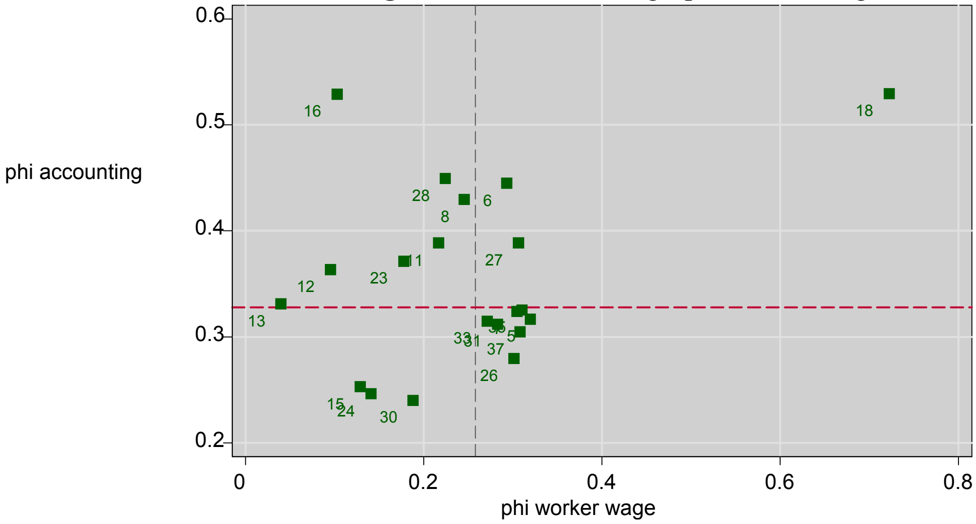
Time dummies are included but not reported. First-step robust standard errors in parentheses.

(1) Instruments used: the lagged levels of q n, m and k dated $(t-2)$ and $(t-3)$ in the first-differenced equations and the lagged first-differences of q, n, m and k dated $(t-1)$ in the levels equations.

Table A.3
Correlation of (relative) extent of rent sharing estimates $\gamma_{_I}$ ($\phi_{_I}$) across the three approaches

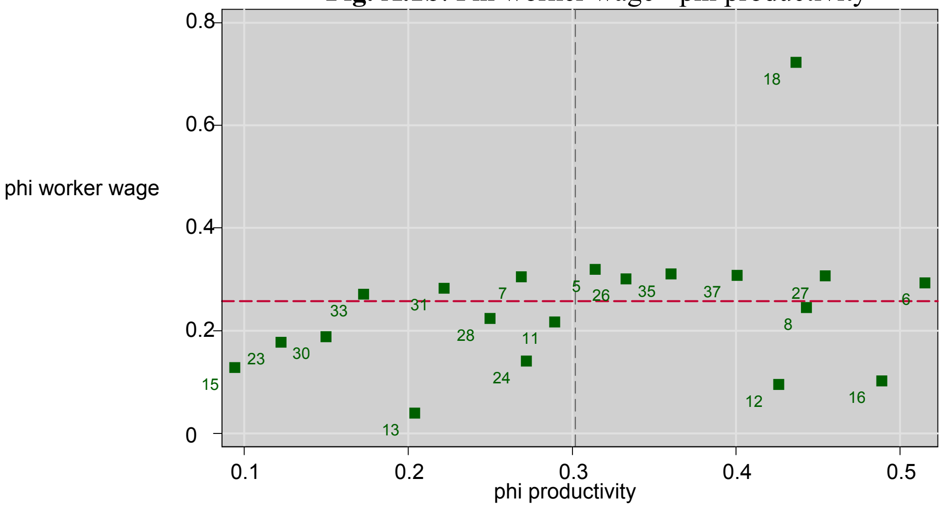
# Ind.	Estimate	Accounting γ_{a_I}	Productivity $\widehat{\gamma}_I$	Wage worker $\widehat{\gamma}_I$	Wage firm $\widehat{\gamma}_I$	Estimate	Accounting γ_{a_I}	Productivity $\widehat{\gamma}_I$	Wage worker $\widehat{\gamma}_I$	Wage firm $\widehat{\gamma}_I$
	GMM SYS $(t-2)(t-3)$					**GMM SYS** $(t-2)(t-3)$				
38	Accounting γ_{a_I}	1.000				Accounting ϕ_{a_I}	1.000			
38	Productivity $\widehat{\gamma}_I$	0.539	1.000			Productivity $\widehat{\phi}_I$	0.202	1.000		
38	Wage worker $\widehat{\gamma}_I$	0.447	0.387	1.000		Wage worker $\widehat{\phi}_I$	0.335	0.109	1.000	
38	Wage firm $\widehat{\gamma}_I$	0.424	0.430	0.293	1.000	Wage firm $\widehat{\phi}_I$	0.384	0.090	0.293	1.000
	Estimate	Accounting γ_{a_I}	Productivity $\widehat{\gamma}_I$	Wage worker $\widehat{\gamma}_I$	Wage firm $\widehat{\gamma}_I$	Estimate	Accounting γ_{a_I}	Productivity $\widehat{\gamma}_I$	Wage worker $\widehat{\gamma}_I$	Wage firm $\widehat{\gamma}_I$
20	Accounting γ_{a_I}	1.000				Accounting ϕ_{a_I}	1.000			
20	Productivity $\widehat{\gamma}_I$	0.668	1.000			Productivity $\widehat{\phi}_I$	0.625	1.000		
20	Wage worker $\widehat{\gamma}_I$	0.501	0.295	1.000		Wage worker $\widehat{\phi}_I$	0.342	0.331	1.000	
20	Wage firm $\widehat{\gamma}_I$	0.571	0.682	0.156	1.000	Wage firm $\widehat{\phi}_I$	0.522	0.628	0.156	1.000
	OLS lev					**OLS lev**				
	Estimate	Accounting γ_{a_I}	Productivity $\widehat{\gamma}_I$	Wage worker $\widehat{\gamma}_I$	Wage firm $\widehat{\gamma}_I$	Estimate	Accounting γ_{a_I}	Productivity $\widehat{\gamma}_I$	Wage worker $\widehat{\gamma}_I$	Wage firm $\widehat{\gamma}_I$
38	Accounting γ_{a_I}	1.000				Accounting ϕ_{a_I}	1.000			
38	Productivity $\widehat{\gamma}_I$	0.382	1.000			Productivity $\widehat{\phi}_I$	0.016	1.000		
38	Wage worker $\widehat{\gamma}_I$	0.464	0.358	1.000		Wage worker $\widehat{\phi}_I$	0.319	0.052	1.000	
38	Wage firm $\widehat{\gamma}_I$	0.698	0.487	0.662	1.000	Wage firm $\widehat{\phi}_I$	0.590	0.062	0.662	1.000
	Estimate	Accounting γ_{a_I}	Productivity $\widehat{\gamma}_I$	Wage worker $\widehat{\gamma}_I$	Wage firm $\widehat{\gamma}_I$	Estimate	Accounting γ_{a_I}	Productivity $\widehat{\gamma}_I$	Wage worker $\widehat{\gamma}_I$	Wage firm $\widehat{\gamma}_I$
22	Accounting γ_{a_I}	1.000				Accounting ϕ_{a_I}	1.000			
22	Productivity $\widehat{\gamma}_I$	0.340	1.000			Productivity $\widehat{\phi}_I$	0.350	1.000		
22	Wage worker $\widehat{\gamma}_I$	0.450	0.197	1.000		Wage worker $\widehat{\phi}_I$	0.204	0.219	1.000	
22	Wage firm $\widehat{\gamma}_I$	0.539	0.522	0.578	1.000	Wage firm $\widehat{\phi}_I$	0.342	0.485	0.578	1.000

Fig. A.1a: Phi accounting - phi worker wage



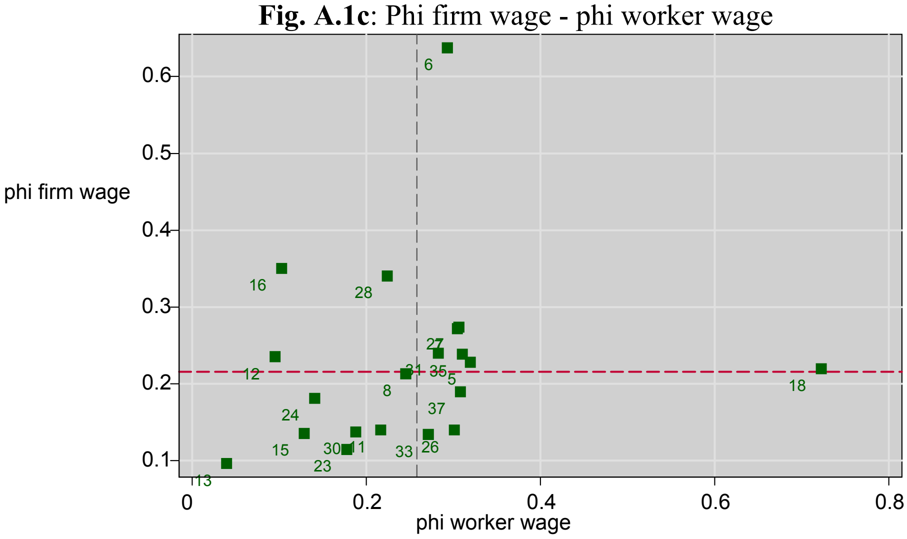
Source: Own estimates, corr.: 0.342

Fig. A.1b: Phi worker wage - phi productivity



Source: Own estimates, corr.: 0.331

Fig. A.1c: Phi firm wage - phi worker wage



Source: Own estimates, corr.: 0.156