The European Journal of Comparative Economics

Vol. 8, n. 2, pp. 265-279

ISSN 1722-4667

Is There Rent Sharing in Italy? Evidence from Employer-Employee Data

Alessia Matano[1], Paolo Naticchioni[2]

Abstract

Using a unique employer-employee panel database, we investigate the extent of rent sharing in Italy from 1996 to 2003. We derive the following findings. First, after controlling for the national bargaining level, there is robust evidence of rent sharing at firm level. Second, by means of fixed effects estimates we show that the sorting of high-ability workers into high-profit firms appears to play a substantial role, since it captures a significant amount of cross sectional estimates of rent sharing. Third, in accordance to the related literature the endogeneity of profits causes a severe underestimation of rent sharing. Our final IV estimate of the elasticity of wages with respect to profits per employee amounts to 6%, with a "Lester" range of 24%. Moreover, we point out that the impact of rent sharing is not homogeneous across several dimensions (gender, occupation, sector and macroarea).

JEL Classifications: C33, J31, J41, L25.

Keywords: Rent Sharing, Sorting, Wage, Italy.

1. Introduction[3]

Competitive labour market models predict no relationship between profits and wages at firm level: firms are wage-takers and face a horizontal labour supply. Therefore, if a firm becomes more profitable there is no reason why it should pay higher wages. However, non-competitive theories, such as efficiency wages models and bargaining theories, predict that there might be a positive relationship between wages and profits. In particular, rent sharing models underline that wages result from a bargain between the employer and the employees which generates a long-run positive relationship between wages and profits. In this setting, wages are determined by workers' outside options, by quasi-rent (firm profits evaluated at the opportunity cost of labour) and by relative bargaining power of the parties involved (Hildreth and Oswald, 1997).

The aim of this paper is to investigate the existence and the extent of rent sharing in Italy. We make use of a unique employer-employee database from 1996 to 2003, constructed by merging the INPS employer-employee database with the AIDA database, which contains information on the balance sheet of capital-owned firms. As a result of this merger, we are forced to restrict our analysis to this type of firm. We estimate a wage equation that includes the quasi-rent variable, which is the proxy for

[1] University of Rome "La Sapienza", Dipartimento di Analisi Economiche e Sociali, Italy.

[2] University of Cassino, University of Rome "La Sapienza", CeLEG–LUISS., Italy; correspondence address: p.naticchioni@gmail.com.

[3] We would like to thank the research partnership between ISFOL (Rome) and Dipartimento di Analisi Economiche e Sociali - University "La Sapienza" of Rome, for the access to the INPS and AIDA databases, as well as to Paolo Ghinetti and Stefano Staffolani for suggestions. We also thank an anonymous referee for helpful comments.

rent sharing. We also take into account several issues that have been proved to be relevant in order to get reliable estimates of rent sharing (Martins, 2009). More specifically, we control for the correlation between profits and workers' unobserved heterogeneity as well as for firm characteristics and for the endogeneity between profits and wages. Moreover, our data take into account the fact that wage setting in Italy is the outcome of bargaining at two different levels: a first centralized (national) level where minimum wages for all occupations are set in all industries (with even more than a national contract for the same industry); a second decentralized level where the employer and employees (or unions at firm level) bargain the wages over the constraints imposed by national contracts. Therefore, we introduce in our estimation dummies that controls for the type of national contract applied to each worker. This turns out to be a more reliable and accurate measure for the first level of bargaining with respect to using industry dummies, as usually done in the empirical literature, since the national bargaining occurs at the national contract level and not at the industry level.

The starting point of our empirical strategy is to use ordinary least squares (OLS) estimates, deriving an elasticity of wages with respect to quasi-rents per employee of around 6.8%, with a Lester range of 27%. After controlling for the first level of bargaining there is still a substantial role for rent sharing at the firm level: coefficient estimates are in fact reduced to around 15%, a finding in line with Arai (2003) and Arai and Heyman (2001) who point out that most of rent sharing takes place at firm level.

We then move to the fixed effect estimates to control for individual unobserved heterogeneity. We find out that the sorting of high-ability workers into high-profit firms plays a substantial role (see Card, Devicienti and Maida, 2010, Arai and Heyman, 2001, Margolis and Salvanes, 2001, Martins, 2009), since estimates are significantly reduced.

Finally, we take into account endogeneity issues, by applying IV estimates: we derive an elasticity of wages with respect to profits of 6% with a "Lester" range of variation in wages between unprofitable and profitable firm of 24%[4]. We also look at the impact of quasi-rents on wages across several dimensions (gender, occupation, macroarea and economic activity) pointing out that the degree of rent sharing is strongly heterogeneous. In particular, we show that rent sharing is higher for males than for females, for white collars than for blue collars, in the service sector compared to manufacturing, and in the Southern regions.

The structure of the paper is as follows. In Section 2 we review the theoretical as well as the empirical literature concerning the relationship between profits and wages. In Section 3 we describe the data we use throughout the empirical analyses. Section 4 discusses the empirical specification and presents the main results. Section 5 concludes.

[4] The "Lester" range is defined as the elasticity of wages with respect to quasi-rent multiplied by four times the ratio between the standard deviation of quasi-rent and mean quasi-rent. It gives us a measure of how much the wage of a worker increases moving from a firm at the bottom of the profit distribution (two standard deviation below the mean) to a firm at the top of the profit distribution (two standard deviations above the mean). Lester (1952).

2. Related Literature

Standard competitive theories predict that there is no relationship between wages and profits at firm level, since wages are determined by labour market conditions and firms have no incentives to pay wages over the level set in the labour market. However, non-competitive theories underline that such a relationship can actually exists, i.e. that firms may indeed pay a wage over the level set in the labour market. This can occur for different reasons. For instance, it is possible that firms pay higher wages than those set in the competitive labour market due to efficiency wage arguments (see Shapiro and Stiglitz, 1984, Krueger and Summers, 1988). Also, according to bargaining theories, profits and wages can move together since employer and employee bargain on wages. More specifically, in a bargaining framework, wages at firm level are determined by workers' outside options, by the quasi-rent (firm profits evaluated at the opportunity cost of labour) and by the relative bargaining power of the parties involved (Hildreth and Oswald, 1997).[5]

As for the empirical evidence, many works studied the existence and the extent of rent sharing in different countries, using various methodologies and data at different levels. Hildreth and Oswald (1997) and Blanchflower, Oswald and Sanfey (1996) -by using respectively firm level (for UK) and industry level data matched with individual data (for US)- provide evidence in favour of an important positive relationships between profits and wages, controlling for observed work heterogeneity and firm characteristics and applying GMM techniques (or using lagged values of profits) to control for the endogeneity of profits.

Other papers used instrumental variables techniques to control for the endogeneity of profits, while using firm level data to take into account firm heterogeneity. For instance Abowd and Lemieux (1993), in the case of Canada, use instruments related to the international performance, namely the industry import and export prices, finding a very large degree of underestimation in the extent of rent sharing when not controlling for the endogeneity between profits and wages. Van Reenen (1996) analyzes the case of the UK using different measures for profits (net profits per head, quasi-rents and Tobin Q), and past innovations as instruments. His findings suggest a substantial amount of rent sharing in UK, and a severe underestimation when not controlling for endogeneity.

More recently, various papers have made use of matched employer-employee panel data in order to control for the unobserved worker heterogeneity. Margolis and Salvanes (2001) investigate the case of France and Norway. They apply IV techniques using as instruments sales and operating subsidies, finding relevant rent sharing only in the case of Norway. For the case of France they show that when taking into account the unobserved individual characteristics in the IV estimation, rent sharing estimates turn out to be not significant. Similarly, using employer-employee data Arai (2003) analyzes

[5] It is worth noting that also within a modified version of the competitive model it is possible that wages and profits are positively correlated. In particular, in presence of short-run frictions, such that firms face an upward sloping labour supply curve, positive demand shocks might bring to a raise in total firm profits and wages (Hildreth and Oswald, 1997). However, in the long-run, wages adjust to the competitive level, unless there are mechanisms that prevent this adjustment. Hence, a test for rent sharing cannot rest on the evidence of a short-run correlation between profits and wages.

the case of Sweden. He uses time-average of lagged values of profits and controls for observable firm characteristics to check the relevance of both the rent sharing and of other theories (based on efficiency wages and short-run labour market frictions). He finds robust evidence of rent sharing in line with bargaining theories, which does not differ across different worker categories.[6] In another related paper Arai and Heyman (2001) make use of a larger employer-employee matched dataset and apply instrumental variable techniques. They use different instruments such as lagged values of profits, demand elasticity (based on predicted response in sales due to higher prices) and measures indicating the degree of competition in the product market. Their findings confirm that rent sharing is underestimated when not controlling for endogeneity and greater estimates are provided when demand elasticity is used as instrument. Furthermore, they point out that white collar workers extract higher rents than blue collar.

Another interesting related paper is Guertzgen (2009), which focuses on how rent sharing is affected by the different levels of bargaining in Germany, using firm-worker level data and GMM techniques. He shows that rent sharing is higher where there is no union sector coverage and in presence of firm-specific contracts. Moreover, he looks at differences among workers' groups, finding that for blue collar workers rent sharing actually disappears under centralized contracts. Also Rusinek and Rycx (2008) analyze the impact of different levels of bargaining (industry and firm level) on the extent of rent sharing, using an employer-employee database for Belgium, a country where the relative importance of industry and firm level agreements (the degree of centralization) differs significantly across industries. Their results show that, after controlling for the endogeneity of profits and heterogeneity among workers and firms, there is a higher degree of rent sharing in decentralized industries. Moreover, in centralized industries, rent sharing is observed only for workers covered by a firm agreement.

Finally, Martins (2009) makes use of matched employer-employee panel data to derive evidence of rent sharing for Portugal over the period 1993-1995. His findings strongly support the need of taking into account the role of both the unobserved individual and firm heterogeneity, since IV estimates (as instruments: the interaction between the exchange rate and the share of total exports in sales) could be biased when these features are neglected (see Martins, 2007, for a survey of the empirical results and methodologies applied).

As for Italy there is a lack of empirical evidence concerning rent sharing. One of the few exceptions is the very recent paper of Card, Devicienti and Maida (2010) that analyzes the degree of rent sharing and tests the hold up hypothesis in the region of Veneto (Italy) for the period 1995-2001. By using INPS-AIDA matched employer-employee data, they perform an accurate analysis taking into account all the relevant issues to be addressed to identify the extent of rent sharing (the sorting of workers and firms and the endogeneity of profits). Their findings show that there is evidence of a substantial degree of rent sharing in Veneto, and that profits are shared with workers after capital costs are fully deducted from profits. Another work on the Italian case is

[6] However, it is worth noting that results of this analysis could be affected by the very small sample size compared with other studies that use employer-employee data.

Pistoresi and Strozzi (2001), who make use of a factor dynamic analysis to analyze the extent of rent sharing in Italy within the microsectors of the Italian basic metal industry through the period 1983–98. Their main findings are that rent sharing in Italy arises only at the centralized level of wage bargaining, while decentralized wage negotiations do not lead to any degree of rent sharing between unions and employers.[7]

These papers are different from ours, since we make use of a unique database for the whole Italian economy and analyze the period from 1996 to 2003, thus being able to shed light on more recent wage dynamics. Moreover, we also look at the extent of rent sharing among different dimensions, which have not been investigated in the case of Italy, such as gender, occupation, sector and macroarea.

3. Data Description

We use a panel version of the administrative database provided by INPS (Italian Social Security Institute) and elaborated by ISFOL.[8] It is a matched employee-employer dataset, constructed by merging the INPS employee information for the period 1985-2003 with the INPS employer information.[9] As far as workers' characteristics are concerned, the database contains individual information such as age, gender, occupation, workplace, date of beginning and end of the current contract (if any), the national contract, the social security contributions, the worker status (part-time or full-time), the real gross yearly wage and the number of worked weeks and days. As for firms, we have the plant location (province), the number of employees and the sector (Ateco91). We focus on male and female workers aged between 15 and 64 (when they first enter in the database), working in the industrial and service sectors, both part-time (converted in full-time equivalent) and full-time, employed in standard labour market contracts: blue collar and white collar workers.[10]

We merge the INPS dataset with detailed data on the balance sheets of the (capital-owned) firms where workers are employed, which come from the AIDA database from 1996 until 2003. AIDA is a database on Italian firms provided by Bureau Van Dijk that contains information on the balance sheet of the firms such as value

[7] Other papers that address issues similar to rent-sharing for Italy are Pencavel, Pistaferri, and Schivardi (2006) who investigate differences in wages between capital-owned and worker-owned firms and Guiso, Pistaferri and Schivardi (2005) who focus on risk sharing and analyze the response in wages to firms specific shocks in value added, distinguishing by temporary and permanent shocks.

[8] ISFOL stands for "Institute for the Development of Vocational Training". The sample scheme has been set up to follow individuals born on the 10th of March, June, September and December and therefore the proportion of this sample on the Italian employees' population is approximately of 1/90.

[9] For the information on employers we also make use of the ASIA ("Italian Statistical Archive of Operating Firms") database, provided by ISTAT. This database has been used since 1999, because the INPS employer database was not available after 1998. The two databases provide the same set of information (firm size and sector).

[10] The sample includes also managers. However, since they account for a relatively small fraction of workers in the sample (only about 1%, because most of the managers are not covered by the INPS database) we include this category within the white collars.

added, profits, sales, production and costs of production.[11] As main independent variable we use quasi rent per worker as in Van Reenen (1996) and Card et al. (2010).[12] We also use real sales per employee in order to carry out IV estimates.

The two databases are merged by using as key variable the tax code or the VAT number (*codice fiscale* or *partita IVA*) of the company. The number of records matched with respect to the total number of records in the INPS database is around 47%. However, it is worth noting that AIDA contains capital-owned firms with total value of production equal or higher than 950.000 euro while INPS data contain workers employed in all kinds of companies no matters the legal status and the amount of the total value of production. Therefore, the share of non-matched records is due to those workers who are employed in other kind of firms or in capital-owned firms with total value of production less than 950.000 euro. After the merge, the panel version has been constructed considering only one observation per year for each worker. For those workers who display more than one observation per year we selected the longest available contract in terms of weeks worked. We further eliminated those extreme observations below (above) the 1st (99th) percentile of the wage and profits per employee distribution as well as observations where the difference in the firm size reported in AIDA and the one reported in INPS exceeds 200 (in this way the correlation between the firm size reported in AIDA and the firm size reported in INPS is equal to 99.97). We finally restrict the sample to the 60 major national contracts, to have enough variability within each contract cell. The dependent variable in our regressions is the (log) real gross weekly wage in euro.[13] Table A1 in the Appendix shows the characteristics of the merge.

We end up with a unique employer-employee panel database constituted by 84,019 workers for 287,749 observations for the period 1996-2003. Table 1 shows the descriptive statistics of the variables of the analysis. The variables of interest are in logarithms.

[11] Data have been deflated using the valued added deflator for value added, profits, sales, production and costs of production. The value added deflator comes from our elaboration of ISTAT data on regional economical accounts and is defined at the sectoral and regional level. The base year is 2002.

[12] Rent per worker evaluated at the opportunity cost of labour, which is defined as the revenue per worker (operative income –which equals to net profits- plus the wage bill), minus the alternative wage that we proxy with the average industrial wage (Van Reenen, 1996).

[13] Wages have been deflated using as deflator the National Consumer Price Index (FOI index, *Indice dei Prezzi al Consumo per le Famiglie di Operai e Impiegati*, ISTAT). The base year is 2002.

Table 1: Descriptive statistics of the variables of the analysis

Variable	Mean	Std. Dev.	Min	Max
Industry				
Log Real Weekly Wage	5.97	0.39	3.92	9.25
Gender	1.30	0.46	1.00	2.00
Age	36.91	10.01	15	71
Age Squared	1,462.85	782.73	225	5,041
Blue Collars	0.63	0.48	0	1
White Collars	0.37	0.48	0	1
Log Firm Size	4.47	1.54	0	10.51
Log Quasi-Rent per Employee	2.61	1.08	-11.78	5.69
Log Real Sales per Employee	5.12	0.85	0.57	10.90
dNorth East	0.30	0.46	0	1
dNorth West	0.40	0.49	0	1
dCentre	0.17	0.38	0	1
dSouth	0.09	0.29	0	1
dIsland	0.03	0.18	0	1
Sectors	39.39	18.72	10	93
Number of Contracts	60.00			
Number of Observations	287,749			
Number of Workers	84,019			

Source: Panel ISFOL on INPS-AIDA data.

4. Econometric Analysis

4.1 Econometric Strategy

In this section we aim at estimating the rents shared by the workers using the INPS-AIDA employer-employee database from 1996-2003. The baseline wage equation is the following:

$$W_{i(j),t} = \alpha + \Pi' * I\_Char_{i,t} + \delta * Firmsize_{j(i),t} + \beta * QR_{j(i),t} + \\ + \Gamma * DCONTRA_{l(i),t} + \lambda_a + \delta_t + \rho_s + \varphi_i + \varepsilon_{it} \quad (1)$$

where i stands for individuals, j for firm, s to sector, t to time and l stands for type of contract. The dependent variable $W_{i,j,t}$ is the logarithm of the real weekly wage. $I\_Char_{i,t}$ stands for a set of individual characteristics such as sex, age, age squared and occupational categories (blue collars and white collars). $Firmsize_{j(i),t}$ is the logarithm of the size of the firm j where the worker i is employed and it is a proxy for firm heterogeneity. $DCONTR_{l(i),t}$ is a set of dummy variables indicating the kind of national contract l a worker is subject to. $QR_{j(i),t}$ is our variable of interest, the logarithm of quasi rent per employee. Finally λ_a, δ_t and ϱ_s are a set of areas, time and sector dummies respectively, while φ_i represents the individual fixed effect in fixed effects estimations.

In the first specification, as benchmark estimates, we perform OLS estimates to derive the impact of quasi rents per worker on wages including only observed individual and firm characteristics. We then perform the same estimation adding dummies for national contracts that indicate for each workers the specific national contract he is subject to (among 60 major contracts). This allows us to take into account the relevance of the national level of bargaining in Italy. Previous empirical studies instead generally used industry dummies (Guertzgen, 2009, Rusinek and Rycx, 2008). However, we claim that using national contracts, available in the INPS data, improves the quality of the approximation of the first level of bargaining, given that the collective bargaining occurs at the contract level and not at the industry level.

Since an important concern in our analysis is to tackle the issue of unobserved individual heterogeneity that can bias the OLS estimates, we then carry out fixed effects estimations (Card, Devicienti and Maida, 2010, Martins, 2009, Arai and Heyman, 2001, Margolis and Salvanes, 2001). Moreover, in order to control for the endogeneity of the profit variable (simultaneous determination of wages and profits), which can also be exacerbated by a fixed effects strategy (Card, Devicienti and Maida, 2010), we apply IV fixed effects techniques. As instruments, we use lagged profits (Blanchflower, Oswald and Sanfey, 1996, Arai 2003, Arai and Heyman, 2001) and lagged real sales per employee, which represents a proxy of the market power of the firm (Margolis and Salvanes, 2001). The underlying assumption is that past profits and real sales per employee are uncorrelated with current labour market conditions.

We also apply the IV methodology to investigate the extent of rent sharing along various dimensions (occupation, gender, macroarea, sector of activity).

4.2 Results

Table 2 shows the OLS estimates of the impact of profits per employee on workers' wages.[14] In column (1) only individual characteristics and firm size are included: the elasticity of wages with respect to profits is 6.8%. We also report the "Lester" range, which is equal to 27%, meaning that a worker who moves from a low-profit firm to a high-profit one gets a wage increase of 27%.

Column (2) shows the same estimates with the introduction of the national contract dummies. By comparing column (1) with column (2), we are able to assess how much of the rent sharing impact is related to the first level of bargaining. As expected coefficients estimates turn out to be reduced, but by a small amount. More precisely, the elasticity of wages with respect to quasi-rents per employee passes from 6.8% to 5.8% and the Lester range from 27% to 23%. This means that more than 80% of the rent sharing is determined within industries (more precisely within "national contracts"), which implies that rent sharing in Italy essentially takes place at the firm level (in line with Arai, 2003, and Arai and Heyman, 2001).[15]

[14] We use clustered standard errors by firm, as suggested in Moulton (1990).

[15] As for the other variables in the estimations, coefficients are as expected: wages show a concave relation in age and increase in the occupational category considered; there is also evidence of gender gap, while firm size exerts a positive impact on wages, consistently with the idea that firm productivity

However, by using OLS estimates it is not possible to control for the unobserved individual heterogeneity, i.e. for the sorting of high-ability workers into high-profit firms (Card, Devicienti and Maida, 2010, Margolis and Salvanes, 2001, Arai and Heyman, 2001, Martins, 2009). Therefore we run fixed effect estimates (Table 3 column (1)), where the elasticity of wages with respect to quasi rent is significantly reduced. In particular, it passes from 5.8% to 1.6% and the Lester range from 23% to 6%. This finding points out that the sorting of workers is important and has to be taken into account when analyzing the relationship between profits and wages.

Table 2: OLS estimates of wage on Quasi-Rent

	(1)	(2)
Gender	-0.2208***	-0.1965***
	[0.0026]	[0.0024]
Age	0.0286***	0.0308***
	[0.0008]	[0.0007]
Age Squared	-0.0002***	-0.0003***
	[0.0000]	[0.0000]
White Collar Dummy	0.3501***	0.3150***
	[0.0030]	[0.0028]
Firm Size	0.0205***	0.0179***
	[0.0011]	[0.0010]
Quasi Rent	0.0680***	0.0580***
	[0.0014]	[0.0012]
Constant	5.1912***	5.0710***
	[0.0197]	[0.0319]
National Contracts Dummies	no	yes
Time Dummies	yes	yes
Area and Sector Dummies	yes	yes
N. Observations	287,749	287,749
R Squared	0.43	0.50

*Notes: Standard errors in parenthesis with ***,** and * denoting significance at 1%, 5% and 10% respectively. Standard errors are clustered by firms.*

Nonetheless, fixed effects estimates have to be taken with caution since the likely endogeneity of profits (due to the possible simultaneous determination of wages and profits) could entail an underestimation of the extent of rent sharing, which can be exacerbated by a fixed effect strategy (Card, Devicienti and Maida, 2010). In order to address this issue we apply IV fixed effects estimations techniques. As instruments, we use the lagged values of both profits per employee and real sales per employee. We claim that, on the one hand, lagged values of profits are likely to be correlated with current values of profits while they are uncorrelated with current wages (as in Blanchflower, Oswald and Sanfey, 1996, Arai 2003, Arai and Heyman, 2001). On the

and wages are positively related with firm size (Postel-Vinay and Robin, 2006, Krueger and Summers, 1988, Brown and Medoff, 1989).

other hand, we use lagged values of real sales per employee as a proxy for the market power of the firm, which is correlated to profits and -we assume- uncorrelated to current wages (as in Margolis and Salvanes, 2001). The IV analysis (column (2) of Table (3)) confirms the validity of the instruments chosen: the F-test on instruments weakness is rejected and the Sargan test concerning overidentifying restrictions cannot be rejected at the 10% level.

Results of the IV estimates (column (2) of Table (3)) confirm that the extent of rent sharing was severely underestimated in previous fixed effects estimations. In particular, the elasticity of rent sharing is now around 6% with "Lester" range equal to 24%. This finding is consistent with previous empirical evidence (Hildreth and Oswald, 1997, Abowd and Lemieux, 1993, Van Reenen 1996, Card, Devicienti and Maida, 2010) and underlines that endogeneity is a very relevant concern in the profit-wage relationship.

Table 3: Fixed effects and IV estimates of wages on Quasi-Rent

	(1)	(2)
Gender	-	-
Age	0.0444***	0.0363***
	[0.0009]	[0.0020]
Age Squared	-0.0003***	-0.0003***
	[0.0000]	[0.0000]
White Collar Dummy	0.0895***	0.0771***
	[0.0042]	[0.0066]
Firm Size	0.0158***	0.0218***
	[0.0010]	[0.0023]
Quasi Rent	0.0161***	0.0617***
	[0.0007]	[0.0057]
Constant	4.6311***	-
	[0.0269]	
National Contracts Dummies	yes	yes
Time Dummies	yes	yes
Area and Sector Dummies	yes	yes
N. Observations	287,749	151,203
N.Individuals	84,019	38,874
Methodology	Fixed Effects	IV Fixed Effects
F-test		428.86
Sargan test (P_value)		0.264

*Notes: Standard errors in parenthesis with ***,** and * denoting significance at 1%, 5% and 10% respectively. Standard errors are clustered by firms. In the IV estimation instruments are lagged log- Quasi-Rents and lagged log real sales per employee.*

To sum up, our results show that after controlling for endogeneity, sorting and first level of bargaining, Italian employers share a not negligible amount of their profits with their workers.[16]

[16] Note that, as underlined in different works (see for instance Hildreth and Oswald, 1997), rent sharing is a long-run relationship, while in the short-run a positive relationship between profits and wages might

4.3 Analysis of the Extent of Rent Sharing by Gender, Occupation, Sector, Macroarea

In this section we investigate the extent of rent sharing across different dimensions. In particular, we compare males and females, blue collars and white collars, the industry sector and the service sector, and the three Italian macroareas. In order to perform such a task we perform the IV estimates adding an interaction term between the quasi-rent variable and a dummy indicating the particular feature in objects. The econometric specification is as follows:

$$W_{i(j),t} = \alpha + \Pi' * I\_Char_{i,t} + \delta * Firmsize_{j(i),t} + \beta * QR_{j(i),t} + \\ + \phi * QR_{j(i),t} * DF_{i,t} + \Gamma * DCONTRA_{t(i),t} + \lambda_a + \delta_t + \rho_s + \varphi_i + \varepsilon_{it} \quad (2)$$

where $QR_{j(i),t}*DF_{i,t}$ is the interaction term between quasi-rent and the dummy of interest (in turn Female dummy, White Collar dummy, Centre and South dummies, and Service dummies). All the other variables are as in previous specification.

We begin by presenting the results for gender and occupation categories (Table 4). As for the estimation related to gender (column (1)), it can be seen that for males (benchmark category) the coefficient for quasi-rent is significant and slightly higher in magnitude than in previous estimates. In fact the elasticity is now equal to 7%, with a Lester range of 28%. When taking into account the interaction term between quasi-rent and the female dummy, there is strong evidence of gender gap since the coefficient is negative and highly significant, thus entailing than females on average enjoy 3.4% less of rent sharing than males (with a Lester range equal to 15%). This finding is consistent with previous empirical evidence on gender gap due to rent sharing (Nekby, 2003).

As for occupation categories (column (2) of Table 4), there is also evidence of a not uniform extent of rent sharing. In particular, the rent sharing coefficient is equal to 5% -with a Lester range of 20%- for blue collar workers (reference category), while it increases to 7.5% -with Lester range of 30%- when taking into account white collars. This evidence point out that high skilled workers are better able to capture rents from their employers than low skilled workers, in line with Arai and Heyman (2001).

We now turn to analyze the extent of rent sharing by other two important dimensions. We take into account the heterogeneity across areas, which is a very relevant issue in the case of Italy characterized by strong regional unbalances, and the difference across economic sectors. The results of the analysis by areas, defined as North (reference category), Centre and South, are shown in column (1) of Table 5. We can see that the estimated coefficient of rent sharing for the Northern regions is equal to 5.9% -with Lester range of 23%-, which is not significantly different from the one of the Centre regions, i.e. the interaction term with the Centre dummy is not significant. Quite surprisingly however, the interaction term with the South dummy is positive and

be due to short-run frictions. However, as also pointed out by Van Reenen (1996), in our analysis it seems unlikely that firms are willing to pay wages above their market values for eight years (our time span) only because of frictions, and therefore we interpret our findings as evidence of rent sharing in line with bargaining theories.

significant and it is also quite high in magnitude: on average in Southern regions the degree of rent sharing is higher than in the rest of Italy of around 4.8%.[17]

As for the difference between sectors of economic activities, we present the results for the industry (reference category) and the service sector (column (2) of Table 5). In the industry sector the degree of rent sharing is on average around 5% -with Lester range of 19%-, slightly lower than the average for the entire sample. The interaction term between rent sharing and the service sector is positive and significant, meaning that in the service sector the extent of rent sharing is higher of around 3%.

Overall, these estimates have shown that the degree of rent sharing is very heterogeneous across the dimensions considered. In particular higher rents are enjoyed by those workers who are males, who are white collars, who work in the service sector and who are located in the South of Italy.

Table 4: IV Estimates of wages on Quasi-Rent by gender and occupation

	(1)	(2)
Gender	-	-
Age	0.0364***	0.0362***
	[0.0020]	[0.0020]
Age Squared	-0.0003***	-0.0003***
	[0.0000]	[0.0000]
White Collar Dummy	0.0775***	0.0119
	[0.0066]	[0.0269]
Firm Size	0.0216***	0.0218***
	[0.0023]	[0.0023]
Quasi Rent	0.0716***	0.0526***
	[0.0062]	[0.0065]
Quasi Rent * Female Dummy	-0.0342***	
	[0.0127]	
Quasi Rent * White Collar Dummy		0.0233**
		[0.0092]
National Contracts Dummies	no	yes
Time Dummies	yes	yes
Area and Sector Dummies	yes	yes
N. Observations	151,203	151,203
N.Individuals	38,874	38,874
Methodology	IV Fixed Effects	IV Fixed Effects
F-test	217.33	215.27
F- test interacted variables	75.84	177.14
Sargan test (P_value)	0.5593	0.567

*Notes: Standard errors in parenthesis with ***,** and * denoting significance at 1%, 5% and 10% respectively. Standard errors are clustered by firms. Instruments are lagged log- quasi rents and lagged log real sales per employee.*

[17] Note that though the coefficients estimates are higher in the South of Italy, the increase in wages due to rents might be compensated by the fact that average quasi rents in the South are lower than in the rest of Italy.

Table 5: IV estimates of wages on Quasi-Rent by area and sectors

	(1)	(2)
Gender	-	-
Age	0.0365***	0.0366***
	[0.0020]	[0.0020]
Age Squared	-0.0003***	-0.0003***
	[0.0000]	[0.0000]
White Collar Dummy	0.0772***	0.0772***
	[0.0066]	[0.0067]
Firm Size	0.0234***	0.0230***
	[0.0025]	[0.0023]
Quasi Rent	0.0592***	0.0498***
	[0.0059]	[0.0058]
Quasi Rent * Centre Dummy	-0.0057	
	[0.0140]	
Quasi Rent * South Dummy	0.0478*	
	[0.0278]	
Quasi Rent * Service Sector Dummy		0.0326***
		[0.0082]
National Contracts Dummies	no	yes
Time Dummies	yes	yes
Area and Sector Dummies	yes	yes
N. Observations	151,203	151,203
N.Individuals	38,874	38,874
Methodology	IV Fixed Effects	IV Fixed Effects
F-test	179.26	219.52
F- test interacted variables 1	27.44	156.63
F- test interacted variables 2	11.24	
Sargan test (P_value)	0.6246	0.147

*Notes: Standard errors in parenthesis with ***,** and * denoting significance at 1%, 5% and 10% respectively. Standard errors are clustered by firms. Instruments are lagged log Quasi-Rents and lagged log real sales per employee.*

5. Conclusions

In this paper we make use of a unique matched employer-employee database to show the existence of a significant degree of rent-sharing in Italy for the period 1996-2003. We show that around 15% of rent sharing derived by OLS estimates is actually captured by the first level of bargaining. We also point out that the sorting of worker plays a crucial role since it significantly dampens the rent-sharing coefficient, thus underlining the need of using individual level panel data for the analysis of the relationship between profits and wages. Finally, endogeneity has also proved to be a very important concern since fixed effects estimates suffer from severe underestimation, in accordance with the related literature. All in all, after controlling for first level bargaining, sorting and endogeneity, we find out estimates of rent sharing in Italy of around 6% with Lester range of 24%. Further, looking at the relationship between rents and wages across different dimensions, we show that the extent of rent sharing is not homogeneous. In particular, this is on average higher for those workers who are males,

who are white collars, who are employed in the service sector and who work in the South of Italy.

References

Abowd J., Lemieux T. (1993), 'The effects of Product Market Competition on Collective Bargaining Agreements: The case of Foreign Competition in Canada', *Quarterly Journal of Economics*, **108**, 983-1014.

Abowd J., Kramarz F., Margolis D.N. (1999), 'High Wage Workers and High Wage Firms', *Econometrica*, **67(2)**, 251-334.

Arai M. (2003), 'Wages, Profits and Capital Intensity: Evidence from Matched Worker-Firm Data', *Journal of Labor Economics*, **21**, 593-618.

Arai M., Heyman F. (2001), 'Wages, profits and individual unemployment risk: evidence from matched firm-worker data', *FIEF Working Paper*, **172**.

Blanchflower D., Oswald A.., Sanfey P. (1996), 'Wages, Profits and Rent Sharing', *Quarterly Journal of Economics*, **111**, 227-252.

Brown G., Medoff J. (1989), 'The Employer Size Wage Effect', *Journal of Political Economy*, **97**, 1027-1057.

Card D., Devicienti F., Maida A. (2010), 'Rent Sharing, Hold Up and Wages: Evidence of Matched Panel Data*', NBER Working Paper,* **16192**.

Guertzgen N. (2009), 'Rent-Sharing and Collective Bargaining Coverage – Evidence from Linked Employer-Employee Data', *Scandinavian Journal of Economics,* **111(2)**, 323-349.

Guiso L., Pistaferri L., Schivardi F., (2005) 'Insurance within the Firm' *Journal of Political Economy*, **113(5)**, 1054-1087*,* University of Chicago Press.

Hildreth A., Oswald A. (1997), 'Rent Sharing and Wages: Evidence from Company and Establishment Panels', *Journal of Labor Economics*, **15**, 318-337.

Krueger A.B., Summers L.H. (1988), 'Efficiency Wages and the Inter-Industry Wage Structure', *Econometrica*, **56(2)**, 259-293.

Lester R.A., (1952), 'A Range Theory of Wage Differentials', *Industrial and Labor Relations Review,* **5**, 483-500.

Margolis D., Salvanes K. (2001), 'Do Firms Really Share Rents with Their Workers?', *IZA Discussion Paper,* **330**.

Martins P.S. (2007), 'Rent Sharing and Wages, *Reflets et Perspectives de la Vie Economique*, **46(2/3)**, 23-31.

Martins P.S. (2009), 'Rent Sharing Before and After the Wage Bill', *Applied Economics*, **41(17)**, 2133-2151.

Moulton B. (1990), 'An illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units', *Review of Economics and Statistics*, **74**, 334-38.

Nekby L. (2003), 'Gender differences in rent sharing and its implications for the gender wage gap, evidence from Sweden', *Economic Letters*, **81**, 403-410.

Pencavel J., Pistaferri L., Schivardi F. (2006), 'Wages, Employment and Capital in Capitalist and Worker Owned Firms', *ILR Review*, **60(1)**, 23-44.

Pistoresi B., Strozzi C. (2001), 'Rent Sharing in Wage Determination. Evidence from Italy' *CEPR Discussion Paper,* **2939**.

Postel-Vinay F., Robin J.M. (2006), 'Microeconometric search-matching models and matched employer-employee data', *Advances in Economics and Econometrics: Theory and Applications*, R. Blundell, W. Newey and T. Persson (eds), Ninth World Congress, Volume 2. Cambridge: Cambridge University Press.

Rusinek M., Rycx F. (2008), 'Rent-Sharing under Different Bargaining Regimes: Evidence from Linked Employer-Employee Data', *IZA Discussion Paper*, **3406**.

Shapiro C., Stiglitz J. (1984), 'Equilibrium Unemployment as a Worker Discipline Device' *American Economic Review*, **74**, 433-444.

Van Reenen J. (1996), 'The Creation and Capture of Rents: Wages and Innovation in a Panel of U.K. Companies', *Quarterly Journal of Economics*, **111**, 195-226.

Appendix

Table A1: Characteristics of the match between AIDA-INPS (1996-2003)

	Universe of Job-Year Observations	Matched Job-Year Observations	Panel Estimation Sample
Number of Workers	205,933	123,462	84,019
Real weekly wage	415.19	443.51	429.38
Age	36	37	37
Females	0.37	0.33	0.30
White collars and Manager	0.38	0.39	0.37
Number of Firms	204,937	67,624	50,555
Firm size (INPS)	2,446	3,068	370
Firm size (AIDA)		2,828	374
Real profit per employee (1000s euro)		31.34	9.54
Quasi Rent per employee (1000s euro)		144.47	21.25
Real sales per employee (1000s euro)		318.51	250.64
Number of Records	1,204,049	564,373	288,782

The Universe of Job-Year Observations refers to the original INPS database, with workers aged between 15 and 64, employed in standard labour contracts (blue collars, white collars and managers) and working in the industry and service sectors. The Matched Job-Year observations refer to the fraction of the INPS database which has been merged with the AIDA database (with no any outlier cleaning). The Panel Estimation Sample has been constructed by using the longest available contract for each worker each year. Data have been further cleaned by dropping outliers (observations for which the difference in absolute value between the firm size reported in AIDA and the firm size reported in INPS was higher than 200 and extreme observations below (above) the 1st (99th) percentile of wages and profits per employee variables) and considering the 60 major national contracts.