

The Extent of Rent Sharing along the Wage Distribution

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Abstract

The relationship between rent sharing and wages has been generally evaluated at the average wages. This paper uses a unique employer-employee panel database to investigate the extent of rent sharing along the wage distribution in Italy. We apply quantile regression techniques and control for national level bargaining, unobserved heterogeneity and endogeneity. Our findings show that the extent of rent-sharing decreases along the wage distribution, suggesting that unskilled workers benefit the most from firms' rents. One possible explanation for this finding refers to the role of unions, which are more interested in favouring unskilled workers.

JEL Classification: C33, J31, J41, L25.

Keywords: Rent Sharing, Unobserved heterogeneity, Wage Distribution, Quantile Regressions, Quantile instrumental variables.

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1. Introduction

European countries are usually taken as examples for non competitive labour markets, for instance because of the role of unions. The economic literature has largely investigated how the wage setting works in non-competitive labour markets, and how rent sharing can emerge in such markets. Non-competitive theories, such as efficiency wages models and bargaining theories, can predict a positive relationship between wages and profits. In particular, bargaining models underline that wages result from a bargain between the employer and the employees which generates a long-run positive relation 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).

At the empirical level many papers have tested the existence and extent of rent sharing (Abowd and Lemieux, 1993, Van Reenen, 1996, Margolis and Salvanes, 2001, Martins, 2009, Card et al., 2010, etc.). However, these analyses have been generally carried out taking into account average wages. In such a way it is not possible to have an insight of the distributional consequences of rent sharing, i.e. it is not possible to take into account the difference in the degree of rent sharing for workers located at different points of the wage distribution.

The aim of this paper is to evaluate the degree of rent sharing along the overall wage distribution in order to get a better understanding of the relationship between profits and wages. There might be different reasons for which rent sharing is not uniform along the workers' wage distribution. On the one hand, it might be argued that if bargaining at the firm level is mainly organized by unions, low and median skilled workers might enjoy a higher degree of rent sharing than high skilled workers. On the other hand, if bargaining occurs mainly at the individual level, rent sharing might favour high skilled workers, who might benefit from higher individual bargaining power and from performance pay schemes (Lemieux et al., 2009). Hence, given the ambiguous theoretical predictions the analysis of rent sharing along the wage distribution is mostly an empirical issue, and to the best of our knowledge this is the first paper that addresses this issue along the whole wage distribution.

In our analysis we make use of a unique employer-employee panel database from 1996 to 2003 for Italy, constructed by merging the INPS (the Italian Social Security Institute) employer-employee panel database with the AIDA database (provided by

Bureau Van Dick) that contains detailed information on the balance sheets of the Italian capital-owned firms.

On the econometric side we carry out an empirical analysis taking into account all the issues which has been proved to be relevant when addressing the relationship between rents and wages.

We begin by estimating the impact of quasi-rents on wages using cross sectional quantile regressions, controlling for workers' and firms observed heterogeneity. In the estimation we use as proxy for the opportunity cost of labour the minimum wage corresponding to the national contract applied to each worker and, within the national contract, to the exact occupation level ('livello di inquadramento') the worker belongs to. We argue that this is a more accurate measure to control for the opportunity cost of labour with respect to the average industrial wage, as generally used in the literature. Another advantage in using individual minimum wages is that they allow controlling in the estimates for the first national collective bargaining level. Cross section estimates show that the impact of rent sharing is decreasing along the wage distribution: rent sharing elasticities go from 6.9% at the 10th wage percentile to 4.7% at the 90th wage percentile.

A second step in the analysis is to control for the workers' unobserved heterogeneity that can affect the relationship between profits and wages (Card, Devicienti and Maida, 2010, Arai and Heyman, 2001, Margolis and Salvanes, 2001, Martins, 2009). By applying quantile fixed effects estimates that explicitly takes into account the individual unobserved heterogeneity (Canay, 2011), results significantly change. In particular, the impact of rent sharing is significantly reduced along the wage distribution. Still, rent sharing elasticities are decreasing along the wage distribution.

The last step of the empirical analysis investigates the endogeneity issue, which has been proved to be a serious concern in the analysis of rent sharing since endogeneity might cause an underestimation of the extent of rent sharing (Card et al., 2010, van Reenen, 1996). Also, the attenuation bias of the cross-sectional estimation could be even exacerbated by a fixed effects strategy (Nickell, 1981). Therefore, we apply IV quantile fixed effect estimation techniques (Galvao, 2011, Galvao and Montes-Rojas, 2010). As instrument we exploit the intuition developed in Card, Devicienti and Maida (2010) by using a weighted average of the real sales per employee in other provinces of Italy in the same 3-digit industry. The idea is that real sales per employee in the same

narrowed defined industry -which represents industry demand shocks - affect the profitability of the firms. On the other hand, these sales relate to firms in other provinces of Italy and therefore they are supposed to be uncorrelated with local labour market conditions. Consistently with the related literature, by applying an IV methodology estimates increase along the whole wage distribution and by a large extent, thus pointing out that there was a severe degree of underestimation in previous fixed effects techniques. In particular, the elasticity of wages with respect to rent is equal to 7.3% at the 10th percentile, 4.8% at the median and 3.7% at the highest percentile, thus confirming that the degree of rent sharing is decreasing along the wage distribution.

As possible explanation for this decreasing pattern one might argue that in Italy the bargaining takes place mainly at the national, regional and firm level, where the role of unions is more effective, while it is less important the individual level bargaining. In this framework, it would be not surprising that, even after controlling for the first national level bargaining, unions negotiate higher rent sharing for low and medium skilled workers than for skilled ones. Our findings support robust evidence to the existing papers that instead of using different percentiles of the wage distribution make use of proxies for the workers' skills, such as occupation and education categories. For instance, Bagger et al. (2013) for Denmark, where it is shown that worker's bargaining power slightly decreases with the education level, and Guertzgen (2009) and Kohn and Lembcke (2007) who find stronger rent sharing impact for blue collar workers.

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.

2. Related Literature

Non-competitive theories underline that firms may pay a wage over the level set in the labour market because of different reasons. First, 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). Second, according to bargaining theories, profits and wages can move together since employers and employees 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).³

As for the empirical evidence, many works studied the existence and the extent of rent sharing in different countries, using various methodologies and various kinds of data. Hildreth and Oswald (1997) make use of firm level data for UK providing evidence in favour of an important positive relationship 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. Similar findings are derived by Blanchflower, Oswald and Sanfey (1996) for the US using industry level data matched with individual data.

Other papers used instrumental variables techniques to control for the endogeneity of profits. Abowd and Lemieux (1993), for 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 UK using different measures for profits (net profits per head, quasi-rents and Tobin Q), and past innovations as instruments. His findings suggest 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 the case of Sweden. He uses time-average of lagged values of profits as instruments and controls for observable firm characteristics to check the relevance of different theoretical explanations for the relationship between profits and wages (rent

³ 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.

sharing, efficiency wages, short-run labour market frictions). He finds out robust evidence of rent sharing, in line with bargaining theories, and this effect does not differ across different workers' categories.⁴ 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.

Also Martins (2009) make use of a matched employer-employee panel data to derive evidence of rent sharing for Portugal in 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.

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 collective agreement coverage and in presence of firm-specific contracts. Moreover, he also shows that blue collar workers in uncovered establishments seem to benefit more from the local bargaining power of works councils, i.e. local unions.

Also Rusinek and Rycx (2013) 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, in industries where agreements are more likely renegotiated at firm-level ('decentralized industries') wages and profits are positively correlated regardless of the type of collective wage agreement. On the contrary, where firm-level wage renegotiation is less likely ('centralized industries'),

⁴ 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.

wages are only significantly related to profits for workers covered by a firm-level collective agreement.⁵

As for Italy there is a lack of empirical evidence concerning rent sharing. One of the few exceptions is the recent paper of Card, Devicienti and Maida (2010) that analyzes the degree of rent sharing and tests the hold up hypothesis for Italy in the region of Veneto 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 needed to identify the extent of rent sharing (the workers' and firms unobserved heterogeneity 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.⁶

3.The Italian institutional setting and Data Description

The institutional issue which is related to this paper concerns the Italian wage setting. Since the beginning of the nineties there is a two-level wage bargaining system, which is similar to schemes used in other European countries such as Germany. The first level concerns a national collective bargaining, which has to preserve the purchasing power of wages at the sector level by incorporating expected inflation rate in wage increases. This is done concretely by setting minimum wages for all workers covered by the related National collective agreements, which are renewed every 2-4 years. Minimum wages are different in each industry, and within industries different minimum wages are assigned to different workers in different occupation levels (*livelli di inquadramento*).

The second level of bargaining is decentralized, and encourages rent sharing through performance-related pay schemes at the region/firm level. This second level is not compulsory for firms and unions, while it is compulsory respecting the lower bound given by the minimum wage of the first national bargaining level.

⁵ See also Martins (2007) for a survey of the main empirical results and methodologies applied concerning rent sharing.

⁶ Another paper for the Italian case is Pistoresi and Strozzi (2003). 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. However, since they use time series techniques and industrial data, they cannot take into account the within industry heterogeneity.

As for the data, we use a panel version of the administrative database provided by INPS (Italian Social Security Institute) and elaborated by ISFOL.⁷ It is a matched employee-employer dataset, constructed by merging the INPS employee information database for the period 1985-2003 with the INPS employer information database.⁸ The database contains individual information such as age, gender, occupation, workplace, date of beginning and end (if any) of the current contract, the kind of national contract and the related minimum wage, the social security contributions, the worker status (part-time or full-time), the real gross yearly wage and the number of worked weeks. We then have some information concerning the firm such as the plant location (province), the number of employees and the sector (NACE Rev.1). We focus on male and female prime-age workers, aged between 25 and 49 (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.⁹

We merge the INPS dataset with the AIDA database, which includes detailed data on the balance sheets of the (capital-owned) firms, from 1996 to 2003. AIDA is a database on Italian firms provided by Bureau Van Dijk that contains information on the balance sheet such as value added, profits, sales, production and costs of production.¹⁰

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.¹¹ After the merge, the panel version has been constructed considering only one observation per year for each

⁷ 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.

⁸ 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).

⁹ 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.

¹⁰ 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.

¹¹ 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, we could not matched records for 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.

worker. For those workers who display more than one observation per year we selected the longest available contract in terms of weeks worked. We also eliminate extreme observations below (above) the 1st (99th) percentile of the wage and quasi rent distribution¹². We also dropped those observations for which the growth rate of wages from year to year was higher (lower) than 100%(-50%) and where the growth rate of the quasi rent variable was higher (lower) than 500%(-500%). These thresholds have been computed taking into account the growth rates values corresponding approximately to the 1st and 99th percentile of the growth rates distribution. Finally, we eliminate those observations where the percentage difference in the firm size reported in AIDA and the one reported in INPS exceeds 5% (in this way the correlation between the firm size reported in AIDA and the firm size reported in INPS is equal to 0.96). Table A1 in the appendix shows the characteristics of the database.¹³

We end up with an employer-employee panel database constituted by 25,796 workers for 123,178 observations for the period 1996-2003.

4. Econometric Analysis

4.1 Econometric Strategy

In this section we analyze the impact of rents on wages. Since our focus concerns the relationship between rents and wages along the wage distribution, we start by performing standard quantile regressions (Koenker and Bassett, 1978). We use the INPS-AIDA employer-employee database from 1996-2003 and the baseline specification is the following:

$$\ln(w_{\theta(i,t)}) = \alpha_{\theta} + \chi_{\theta} * \ln MW_{c(i,t)} + B'_{\theta} * I_Char_{i,t} + \beta_{\theta} * \ln Firmsize_{j(i,t)} + \gamma_{1,\theta} * \ln Quasi Rents_{j(i,t)} + \phi_{s,\theta} + \lambda_{a,\theta} + \delta_{t,\theta} + \varepsilon_{i,t,\theta}$$

where θ refers to the percentile, i to individuals, $j(i,t)$ to the firm where the worker i is employed at time t , $c(i,t)$ to the national contract (along with its level) the worker is subject to, s to industry. The dependent variable in our regressions is the (log)

¹² Note that we eliminate all the observations of workers for which there is at least one outlier.

¹³ The high reduction in the number of observations which can be noted from Table A1 concerns the availability of the minimum wage. Moreover, we drop those workers who are present only one year in the database, since we make use of panel fixed effect estimations.

real gross weekly wage in euro.¹⁴ As main independent variable we use the quasi-rent per worker, $QuasiRents_{j(i,t)}$, as in Van Reenen (1996) and Card et al. (2010).¹⁵ The term $I_Char_{i,t}$ is the set of observed individual characteristics (age, age squared, tenure and occupation dummy). $MW_{c(i,t)}$ is the national contract minimum wage. $FirmSize_{i,t}$ is the proxy for firm heterogeneity, while φ_s , λ_a , δ_t are industry, area (five macro-areas in Italy: Northwest, Northeast, Centre, South and Islands) and time dummies respectively. All the variables of interest are in logarithms and therefore we estimate elasticities. Table 1 shows the descriptive statistics of the variables of the analysis.

Table 1: Descriptive Statistics of the Variables of the Analysis

Variable	Mean	Std. Dev.	Min	Max
Log Real Weekly Wage	5.98	0.28	4.39	8.86
Log Real Weekly Minimum Wage	5.69	0.12	5.37	6.80
Age	37.72	9.72	25	56
Age Squared	1,477.83	755.89	625	3,136
Blue Collars	0.63	0.48	0	1
White Collars and Manager	0.37	0.48	0	1
Log Firm Size	4.65	1.51	0	10.69
Log Quasi-Rent per Employee	3.01	0.96	-6.14	5.01
Log Real Sales per Employee other provinces (instrument)	5.23	0.50	2.63	7.16
Tenure 0-1	0.33	0.48	0.00	1.00
Tenure 2-9	0.48	0.50	0.00	1.00
Tenure >9	0.19	0.37	0.00	1.00
dNorth East	0.30	0.46	0	1
dNorth West	0.42	0.49	0	1
dCentre	0.16	0.37	0	1
dSouth	0.09	0.28	0	1
dIsland	0.03	0.17	0	1
Sectors	39.18	17.20	15	93
Number of Contracts	39.00			
Number of Observations	123,178			
Number of Workers	25,796			

Source: Panel ISFOL on INPS-AIDA data.

¹⁴ 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.

¹⁵ 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 minimum wage (Van Reenen, 1996).

In the first specification, as benchmark estimates, we perform cross-sectional quantile estimates where, as already stressed, we use as alternative wage the minimum wage which captures the extent of the first (national) level of bargaining. It is worth noting that the minimum wage turns out to be a very accurate measure to control for the first level bargaining at the national level. At the same time it is the best available measure of the opportunity cost of labour. We believe this measure represents a valuable improvement with respect to the average industrial wages usually used in the literature, mainly because it is related to the specific contract (and within the contract to the specific level) the worker belongs to.

Since an important concern in our analysis is to tackle the issue of the unobserved individual heterogeneity that can bias the cross sectional estimates, we then carry out quantile fixed effects estimates (Canay, 2011). In fact, workers' unobserved heterogeneity has been proved in the literature to be very important in affecting the relationship between rents and wages since high skilled workers may sort into high profitable firms (Card, Devicienti and Maida, 2010, Martins, 2009, Arai and Heyman, 2001, Margolis and Salvanes, 2001).

Finally, in order to control also for the issue of the endogeneity between profits and wages (due to simultaneous determination and to possible measurements errors in variables) we also apply an IV strategy. The literature has stressed that in case of endogeneity the (attenuation) bias in the cross-sectional estimates can be severe and also aggravated by a fixed effects strategy (Card, Devicienti and Maida, 2010).

Therefore, we use a very recently developed estimation strategy of IV quantile fixed effects estimates (Galvao, 2011, and Galvao and Montes-Rojas, 2010), which is an extension of the IV quantile procedure of Chernozukov and Hansen (2008) that allows for the inclusion of fixed effects as introduced in Koenker (2004).¹⁶ As instrument we exploit the idea developed in Card, Devicienti and Maida (2010) by using a weighted average of the firm sales per employee in other provinces of Italy but in the same three-digit industry of the considered firm. The weights are the inverse of the distance between provinces. The idea is that industry sales, which represent industry demand shocks, affect the profitability of the firms while and, at the same time, they are not correlated with local labour market conditions since they concern firms in other provinces of Italy.

¹⁶ For a detailed description of the procedures applied see the appendix in Matano and Naticchioni (2012) and Canay (2011), Galvao (2011) and Galvao and Montes-Rojas (2010).

4.2 Results

Table 2 shows the cross-sectional quantile estimates of the impact of profits per employee on workers' wages, by using the minimum wage as a measure for the opportunity cost of labour.

The main variable of interest, rent sharing, displays a not uniform impact along the wage distribution. In particular, elasticity estimates turn out to be equal to 6.9% at the 10th percentile, 5.7% at the median and 4.7% at the 90th percentile. Moreover, since these elasticities have been computed by controlling for the importance of the first (national) level of bargaining, they suggest that there is a not negligible rent sharing that essentially take place at the local, regional or firm level.(consistently with Van Reenen, 1996).^{17 18}

The cross sectional standard quantile regressions are likely biased because they do not take into account the workers' unobserved heterogeneity. Therefore we run quantile fixed effects estimates (Canay, 2011), which allows introducing fixed effects in the estimation, in such a way to capture time invariant workers' characteristics such as ability and education. Table 3 shows the results. Estimates significantly change: coefficients are strongly reduced in magnitude (around 60%) and they are still slightly decreasing along the wage distribution.

These results are consistent with previous empirical evidence that shows that taking into account the workers' unobserved heterogeneity entails a high reduction in the estimated degree of rent sharing (see for instance Card et al., 2010, Martins 2009).

¹⁷ As for the control variable in the estimation, results are as follow: the impact of minimum wage is positive and increasing along all the wage distribution and its elasticity is higher than 1, meaning that an increase in the minimum wage implies a more than proportional increase in the corresponding worker's wage; the age coefficients shows a concave pattern, which is increasing along the wage distribution; the gender wage gap is higher at the highest percentiles; the return to tenure is positive and decreasing along the wage distribution and the occupation dummy is positive and increasing, highlighting higher wages for higher occupation categories. The firm size has a just slightly decreasing impact along the wage distribution.

¹⁸ Within this literature it is quite standard to provide a measure of the "Lester" range. 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 (Lester, 1952). It provides 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). In this paper we cannot provide measures for the "Lester" range, since we are working with quantiles and not with average wages. Nonetheless, we report the Lester range computed using OLS on the average wages shown in table A2 in the appendix, which amounts to 19%.

Table 2: Quantile Regressions of Wages on Quasi Rents with Control on First Level of Bargaining.

	q10	q25	q50	q75	q90
Ln Quasi Rent	0.069***	0.059***	0.057***	0.054***	0.047***
Ln Minimum Wage	1.449***	1.539***	1.659***	1.755***	1.775***
Gender	-0.086***	-0.076***	-0.091***	-0.120***	-0.150***
Age	0.009***	0.010***	0.011***	0.012***	0.016***
Age Squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
Tenure 2-9	0.057***	0.041***	0.025***	0.015***	0.009***
Tenure >10	0.089***	0.065***	0.042***	0.025***	0.015***
White Collar and Manager	0.061***	0.052***	0.061***	0.086***	0.131***
ln Firm Size	0.014***	0.015***	0.015***	0.012***	0.009***
Const	-3.128***	-3.445***	-4.000***	-4.363***	-4.354***
Area, Time and Sector dummies	yes	yes	yes	yes	yes
N. Observations	123,178	123,178	123,178	123,178	123,178
N. Individuals	25,796	25,796	25,796	25,796	25,796
R squared	0.35	0.38	0.41	0.43	0.44

Notes: ***,** and * denote significance at 1%, 5% and 10% respectively.

	q10	q25	q50	q75	q90
Ln Quasi Rent	0.027***	0.021***	0.020***	0.020***	0.019***
Ln Minimum Wage	0.855***	0.864***	0.880***	0.899***	0.914***
Age	0.040***	0.037***	0.035***	0.033***	0.030***
Age Squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
Tenure 2-9	0.048***	0.028***	0.012***	0.002***	-0.011***
Tenure >10	0.054***	0.027***	0.009***	-0.005***	-0.026***
White Collar and Manager	0.047***	0.049***	0.048***	0.049***	0.056***
ln Firm Size	0.009***	0.009***	0.010***	0.011***	0.011***
Const	-0.097***	0.004	0.025	0.009	0.060*
Area, Time and Sector dummies	yes	yes	yes	yes	yes
N. Observations	123,178	123,178	123,178	123,178	123,178
N. Individuals	25,796	25,796	25,796	25,796	25,796
R squared	0.42	0.49	0.53	0.52	0.48

Notes: ***,** and * denote significance at 1%, 5% and 10% respectively.

Finally, we present the IV estimates to tackle the endogeneity between rents and wages, endogeneity that can cause a severe underestimation of the degree of rent sharing, which can be also worsened by a fixed effects strategy (Card et al., 2010). The estimation has been carried out simultaneously on three percentiles (10th, 50th, 90th) due to computational reasons. Moreover, since in this procedure is not possible to test the weakness of the instrument, we have carried out a standard IV fixed effects estimation -on the average- (see table A2 in the appendix) checking the F-statistics of the first stage. The F-value for the instrument in the first stage is significant and higher than the threshold value of 10, confirming that the instrument chosen is not weak.

When taking into account the endogeneity of the relationship between profits and wages, results significantly change (Table 5). In fact the elasticities of rents with respect to wages are now higher and the highest increases concern the lower tail of the wage

distribution. In particular, rents show a decreasing impact along the wage distribution with elasticities ranging from 7.3% at the 10th percentile, to 4.8% at the median and to a 3.7% at the 90th percentile. These estimates are consistent with those of Card, Devicienti and Maida (2010) who find an elasticity of (average) wages with respect to rents for Veneto in Italy of 4.5%. This means that once having controlled for the national centralized level of bargaining, the rent sharing in Italy is such to favour unskilled workers.¹⁹ This finding is consistent with the idea that unions in Italy are relevant not only at the national level, but also at the local/regional/firm level. Moreover, this result is also in line with Bagger et al (2013) who, using a structural matching model, have shown that workers bargaining power slightly decreases with the education level. Similar findings are derived by Guertzen (2009) and Kohn and Lembcke (2007) who find that rent sharing is greater for blue collar workers.

¹⁹ By dividing firms with respect to the quartiles of the profit distribution and worker with respect to the quartiles of the wage distribution, we find evidence that high paid workers are mostly employed in high profits firms, while low paid workers are mostly employed in low profits firms. It is also interesting to note that the rate of growth of profits is not the same in the four quartiles of the profits distribution. Our descriptive analysis (available upon request) shows that firms that enjoy higher growth rates of profits are those in the top quartile (on average 8% per year). Joint with previous results, this evidence suggests that low skilled workers are characterized by a higher degree of rent sharing than high skilled workers, but at the same time they are employed in firms which experience relatively lower growth rates, thus partially balancing out (in cumulative terms) their greater rent sharing elasticities.

Table 4: IV Quantile Fixed Effects Regressions of Wages on Quasi Rents.

	q10	q50	q90
In Quasi Rent	0.073***	0.048***	0.037***
In Minimum Wage	0.847***	0.889***	0.963***
Age	0.037***	0.030***	0.027***
Age Squared	-0.000***	-0.000***	-0.000***
Tenure 2-9	0.053***	0.010***	-0.015***
Tenure >9	0.057***	0.008***	-0.029***
White Collar and Manager	0.034***	0.033***	0.040***
In Firm Size	0.011***	0.013***	0.014***
Const	16.109***	16.375***	16.205***
Area, Time and Sector dummies	yes	yes	yes
N. Observations	123,178	123,178	123,178
N. Individuals	25,796	25,796	25,796

Notes: ***,** and * denote significance at 1%, 5% and 10% respectively. Instruments are the linear projections of other provinces average sales per employee on the endogeneous variables.

Conclusions

The innovative contribution of this paper is to analyze the degree of rent sharing along the wage distribution, which enrich the existing literature that focuses on average wages and that in some cases also investigates rent sharing for specific groups of workers defined by education or occupation categories. We make use of a unique employer-employee database for Italy, which merge administrative records for workers (INPS) and balance sheet data for firms (AIDA). Our findings show that the rent sharing impact is not uniform along the wage distribution. In particular, taking into account the first national level of bargaining, unobserved heterogeneity and

endogeneity, we find out a decreasing pattern of rent sharing along the wage distribution, with elasticities of wages with respect to quasi rents passing from 7.3% at the 10th percentile to 3.7% at the 90th percentile of the workers' wage distribution. One of the possible explanations for this finding refers to the role of unions in protecting the lowest paid workers' categories, since in Italy, as in other European countries, unions play a crucial role in the bargaining process between employers and employees, while the individual bargaining is less important.

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Appendix

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

Table A1: Characteristics of AIDA-INPS (1996-2003)		
	Matched Year Observations	Job- Panel Estimation Sample
Number of Workers	124,022	25,796
Real weekly wage	443.71	416.30
Real weekly minimum wage	297.35	297.38
Age	37	38
Females	0.33	0.31
White collars and Manager	0.39	0.37
Number of Firms	68,406	34,063
Firm size (INPS)	3,057	710
Firm size (AIDA)	2,816	533
Quasi Rent per employee (1000s euro)	185.58	26.44
Real sales per employee (1000s euro)	319.90	223.10
Number of Records	564,034	123,178

The Matched Job-Year Observations refers to matched INPS-AIDA 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, with no cleaning of outliers or missing values. The Panel Estimation Sample has been constructed by using the longest available contract for each worker each year and restricting the sample to those workers aged between 25-49. Data have been further cleaned by dropping: outliers (extreme observations below (above) the 0.5th (99.5th) percentile of the percentage difference in the firm size reported in AIDA and the firm size reported in INPS; individuals characterized by extreme observations below (above) the 1st (99th) percentile of wages and quasi rents variables and below (above) the 0.5th (99.5th) for the sales per employee variable; individuals characterized by observations for which the growth rate of the wage from year to year was higher than 100% or less than -50% and where the growth rate of the quasi rent variable was higher than 500% or less than -500%, and finally individuals for which information on the minimum wage was not available).

Table A2: Regressions of Average Wages on Quasi Rents with Control on First Level of Bargaining.

	(1)	(2)	(3)
	Cross Section	Fixed Effects	IV-Fixed Effects
Ln Quasi Rent	0.063***	0.022***	0.056***
Ln Minimum Wage	1.575***	0.885***	0.905***
Gender	-0.114***		
Age	0.013***	0.035***	0.034***
Age Squared	-0.000***	-0.000***	-0.000***
Tenure 2-9	0.033***	0.016***	0.016***
Tenure >10	0.050***	0.011***	0.012***
White Collar and Manager	0.098***	0.049***	0.048***
ln Firm Size	0.013***	0.010***	0.013***
Const	-3.658***	-0.028	-0.198***
Area, Time and Sector dummies	yes	yes	yes
N. Observations	123,178	123,178	123,178
N. Individuals	25,796	25,796	25,796
R squared	0.63	0.19	0.17
F Test Instrument First Stage			2,108.46

Notes: ***, ** and * denote significance at 1%, 5% and 10% respectively.