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# Rent Sharing and Wages

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**Abstract** – *This paper overviews some of the main themes in the literature that researches the link between firms' profitability and workers' wages. It includes a survey of the literature – which finds systematic evidence of rent sharing –, a description of different econometric methods and data sources, a reference to economic policy issues, and some suggestions for further research.*

**Key words** – *wage structures, profits, endogeneity.*

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## 1 INTRODUCTION

A large body of research has established that different workers are paid different wage rates, even when controlling for many of their observable differences. One specific dimension of such differences across workers that has attracted particular interest concerns the role of the firms in which workers are employed and, in particular, the role of firms' profitability – the subject of this paper.

From the point of view of the simplest competitive labour market model, one would not expect that profitability differences across firms would lead to differences in wage rates of similar workers. After all, under the competitive model, supply and demand for each worker type would lead to a single price (*i.e.* a single wage rate) paid to all workers with the same set of characteristics. The only exceptions would occur because of compensating differentials: *e.g.* if some firms offer worse working conditions, their workers would demand a premium to compensate them for that.

However, there are alternative, non-competitive models of the labour market that have very different implications as to the existence of wage differentials and rent sharing. Three important examples are the equilibrium unemployment theory, efficiency wages models and “fairness” models. For instance, a core assumption of equilibrium unemployment models is that matches between employers and

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employees involve frictions that generate rents which are then shared between the two parties. To the extent that an employer cannot fill a vacancy instantaneously and that an unemployed worker cannot immediately find a job, then wages will tend to be somewhere in between the value of the marginal product of the worker, from the point of view of the employer, and the worker's outside option (the unemployment benefit or a minimum wage, for instance). The difference between the wage and each party's outside option would then depend on their bargaining powers.

Moreover, there is now a considerable body of empirical literature that presents evidence of strong positive correlations between different measures of profitability and wages, using different econometrics methods. This is a finding that strengthens the view that rent sharing is an important component of the functioning of labour markets. By "rent sharing" one is therefore referring to a situation in which rents (profits above the level that results from paying all factors their market rates) are shared by the firm, at least in some part, with the employees of that firm.

## 2 RESEARCH METHODOLOGIES

Most empirical studies begin with a bargaining model in which workers and their employers decide how to split their firms' profits, by choosing over wages and employment levels:

$$(1) \text{Max}_{w,N} [\phi \log \{(w - x)N\} + (1 - \phi) \log \pi]$$

where  $w$  represents the wage rate,  $N$  the employment level,  $x$  is the alternative wage and  $\phi$  the bargaining power of workers.  $\pi$  are profits, equal to  $\theta F(N,K) - wN - rK$ , in which  $\theta$  is a demand shifter,  $F(\cdot)$  the production function (assumed to depend only on labour and capital),  $r$  the interest rate, and  $K$  the capital stock.

As in other cases, some assumptions also need to be made here in order to simplify the theoretical model. For instance, it is assumed that the outside option of employers is zero profit. Possibly more important, particularly from the point of view of Europe (as opposed to the US), it is also assumed that employers can freely adjust their employment levels, disregarding the considerable adjustment costs faced in a large number of European countries.

Adopting these assumptions and after some algebra, one obtains an empirically testable wage equation that results from the above-described bargaining process:

$$(2) \quad w = x + \frac{\phi}{1 - \phi} \frac{\theta F(N, K) - rK - wN}{N}.$$

Transition from the theoretical relationship in equation (2) to empirical analysis is not always smooth. For instance, for econometric convenience, authors typically estimate the equation above using the logarithm of wages, although the model indicates the use of wage levels. More important, the concept of rent sharing is particularly challenging to measure. For instance, one needs to know the opportunity cost of all factors used by the firm, including those of labour.

After addressing (or not) such issues, one finally arrives at a wage equation that can be estimated with data sets available in an increasing number of countries:

$$(3) \quad y_{it} = X_{it}\beta_1 + F_{it}\beta_2 + \beta_3\pi_{j(i,t),t} + \varepsilon_{it},$$

where  $y_{it}$  denotes the logarithm of real hourly wages of worker  $i$  in period  $t$ ,  $X_{it}$  will be a set of human capital variables (schooling, tenure, occupation, gender, etc) that will allow one to control for the differences in the workers' outside options, and  $F_{it}$  will be a set of firm characteristics (industry, size, age, region, ownership type, etc) that will similarly control for differences across firms (and their workers) in terms of their likely level of profitability and/or differences in terms of compensating differentials. Finally,  $\pi_{j(i,t),t}$  will denote some measure of rents (typically profits per worker) in period  $t$  at the firm ( $j$ ) of worker  $i$  in period  $t$ . Finally,  $\varepsilon_{it}$  is an error term following the standard assumptions

As mentioned below, depending on the richness of the data, one can also include more sophisticated controls for differences across workers and their firms, such as in the following specification:

$$(4) \quad y_{it} = X_{it}\beta_1 + F_{it}\beta_2 + \beta_3\pi_{j(i,t),t} + v_{ij} + \varepsilon_{it},$$

where  $v_{ij}$  denotes a worker-firm spell fixed effect, *i.e.* a dummy variable for each worker observed in the same firm. Under this approach, the estimation of the  $\beta_3$  coefficient, the key result from the analysis, will be unbiased, under the assumption that variation of profits within a worker-firm match is exogenous (not simply within a worker over time, not to mention across workers).

However, even such a rich specification as the one above can still be misleading, to the extent that it may not warrant a causal interpretation of the link between profits and wages. For instance, it may be the case that other (missing) variables are simultaneously driving profits and wages, so that there is not a direct impact of profits upon wages. Among other possible examples, if the demand of the products of an industry is expanding, the value of their workers' marginal product will increase and their firms will also enjoy higher rents, at least until the industry moves back to a long-run equilibrium. Nonetheless, although wages and profits increase simultaneously, there is no causality from profits to wages.

In order to rule out this type of events, it will be necessary to find instrumental variables – variables that are correlated with profits but which do not play any direct impact on wages. One example is exchange rates: it can be argued that changes in exchange rates will affect profits of firms that export and/or import and it can also be argued that there are no additional channels whereby exchange rates affect wages (the exclusion restriction).

A related methodological issue is about the presentation and comparison of estimates of rent sharing. A relatively popular approach involves the use of the Lester range (Lester, 1952). This range, defined as the elasticity of wages with respect to profits multiplied by four times the ratio between the standard deviation of profits and mean profits, can be interpreted as indicating the degree to which wages change if a worker were hypothetically to move from a low- to a high-rents firm. More specifically, the range considers a worker that keeps all characteristics unchanged except that he or she switches jobs from a firm whose profits are two standard deviations below the mean level of profits to another firm whose profits are two

standard deviations above that mean level. Of course, this range is not necessarily a measure easily comparable across countries as the dispersion of profits across firms may also vary from economy to economy, not to mention across samples that cover different subsets of firms.

### **3 DATA USED AND THEIR RELATIVE MERITS**

Studies of rent sharing have used data measured at the industry-, firm- or worker-level. Obviously, the more disaggregated the data, the better, as the quality of the test is much higher if one can specifically relate the wages, say, of each worker to the profits of his/her firm than if one can only relate the average wages of an entire industry to the profits of that same industry. Alternative explanations that may also affect the correlation between profits and wages (*e.g.* unobservable differences across workers) tend to be much more difficult to control when using more aggregate data.

In this context, the recent emergence of matched employer-employee (longitudinal) data sets is a major step towards more sophisticated analyses of rent sharing. Having access to information about the same worker over time and simultaneously about the characteristics of that worker's firm, one is able to assess if changes in the profitability of the firm are systematically related to changes in the worker's wages. However, as mentioned above, one needs to acknowledge the fact that even data of such quality and complexity may not be enough to adequately estimate rent sharing effects. Good instruments may also be fundamental for the identification of the rent sharing effect.

Moreover, even if endogeneity of this type is not a concern as it may be wiped out by within-differencing, it is still true that many countries do not have such matched data available. Currently, they only exist in some European countries, in some states of the US and in a few other countries in the world<sup>1</sup>. In the European Union, the best known matched employer-employee panel data sets are those of Denmark, Finland, Portugal, and Sweden (France, Germany, Switzerland and Austria are also important examples). Each data set covers all firms in each country and all employees of each firm in each year over a relatively long period (typically at least since the early 1980s).

### **4 SOME MAIN EMPIRICAL RESULTS**

One may argue there are three main strands in the empirical literature. The first set of results focuses on the control for firm or firm/worker fixed effects, exploiting the longitudinal nature of their data. This literature includes Blanchflower, Oswald and Sanfey (1996), Hildreth and Oswald (1997) and Bronars and Famulari (2001). All

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1. The Nordic countries data sets tend to stand out, as, unlike most other countries which also have matched data, they include detailed information not only of all workers (and their firms) in each economy as household and unemployment information are typically also available. Such wealth of data allows researchers to control for many variables that would be unobservable (and potentially correlated with the variable of interest, rents or profits) with less detailed data sets.

papers present significant estimates of rent sharing for the countries covered (US, UK and US again, respectively); the first using industry-level data, while the latter two use firm-level panels.

A second stream focuses on the endogeneity of profits and the role of instruments in achieving identification of the bargaining models. Some instruments are based on international trade, such as Abowd and Lemieux (1993), who use prices of imports and exports, and Teal (1996), who uses exchange-rate variation. Different instruments include past technological innovations – Van Reenen (1996) – and output movements in the sector to which an industry sells – Estevão and Tevlin (2003). Again all papers find evidence of rent sharing.

A third and most recent stream of the empirical literature combines controls for unobserved variables and the instrumentation of profits. To our knowledge there are only four contributions here: Margolis and Salvanes (2001), Arai (2003), Kramarz (2003) and Martins (2004). Overall, these papers have documented smaller estimates of rent sharing than those typically obtained in the literature that focuses on the endogeneity of profits; and either smaller or similar results to those of the stream of the literature that controls for time-invariant characteristics.

In Margolis and Salvanes (2001), the authors examine the degree of rent sharing in France and Norway, using large matched employer-employee panel data sets and progressively adding further controls to the wage equations. In their final specification, which includes controls for industries, business cycle effects, fixed worker and firm effects and an instrument, Margolis and Salvanes eliminate the rent-sharing coefficient in France but not in Norway. However, one concern about the results of Margolis and Salvanes (2001) is that they use what they consider to be “weak” instruments (sales). This could explain their insignificant results for the case of France.

Swedish data is used in Arai (2003), who examines a panel of workers and finds Lester ranges of between 12% and 24%. Arai’s results support bargaining interpretations of the wages-profits correlations rather than those based on supervision efficiency-wages models or short-run demand frictions. In a related paper, Arai and Heyman (2001), a large Swedish matched panel with information for 1991 and 1995 is used and robust evidence of rent sharing is found. As in the other papers that use IV referred above, rent-sharing estimates increase substantially when profits are instrumented (with survey evidence on the degree of product-market competition faced by each firm): Lester ranges go up from 14% to 50%.

Kramarz (2003) considers French matched data. Special attention is placed on the twofold impact of imports: decreasing the workers’ outside options (due to outsourcing decisions) but improving workers’ bargaining outcomes (due to the hold-up that can arise after firms invest in importing schemes). Rents are instrumented with lagged prices of US exports. The results indicate that, for most workers, the effect of deteriorating outside options is stronger than that of the import investments hold-up. The bargaining power parameter is estimated at 0.20.

Finally, Martins (2004) finds that estimates using instrumental variables tend to overestimate the amount of rent sharing if controls for firm or worker characteristics are missing. This upward bias also occurs if the measure of rent sharing used (typically net profits) is less correlated with the instrument than an alternative measure

(gross profits). Evidence is found of a significant and substantial amount of rent sharing in our data, leading to a Lester range of 56%<sup>2</sup>.

## 5 CONSEQUENCES FOR ECONOMIC POLICY

Rent sharing may have important macroeconomic implications, as it may prevent an efficient allocation of labour across firms. If firms that are successful in their product market are forced to pay higher wages than other firms, then those more profitable firms will necessarily hire fewer workers than if they were not subject to rent sharing. This phenomenon may be particularly important if constraints to pay discrimination force the successful firms to pay higher wages not only to current workers but also to new hires. This will also contribute to involuntary unemployment and labour-market segmentation: there will be workers willing to be employed at wage rates paid in such firms.

A related possibility is that employment fluctuations will also be less than otherwise, particularly if in periods of lower profits firms are able to cut back on the rents shared with workers during periods of greater prosperity. In other words, economic fluctuations will lead to wage changes and relatively small employment adjustments. However, given the evidence of (nominal) downward wage rigidity for many countries, more complex models of wage bargaining may be warranted: firms may anticipate that any wage increases due to profit sharing will not be recovered in periods of low profits, leading to levels of rent sharing lower than otherwise.

Rent sharing will also affect the division of surplus between capital and labour, favouring the latter at the expense of the former. From a normative point of view, if it is deemed desirable to redress the “imbalance” between the remuneration of the two factors of production so that labour earns an increasing share of surplus (however distributed across workers), then “promoting” rent sharing may be a good way to achieve such goal.

## 6 TRACKS FOR FUTURE RESEARCH

There are several avenues in which rent sharing raises important questions which have received yet limited attention. One of them concerns the increasing internationalisation of production, as globalisation becomes a more important phenomenon. One consequence of globalisation is that the outside options of employers – and thus their bargaining power – is enhanced, as offshoring and outsourcing become easier to implement. As this leads to the erosion of the relative bargaining power of workers, if rent sharing is indeed an important component of wage determination, lower wages will follow.

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2. In a very recent paper, Martins and Esteves (2006), matched panel data from Brazil is used, following a similar methodology than that of Martins (2004). Interestingly, no evidence is found of rent sharing, with zero Lester ranges across many different specifications and estimation methods. This result may suggest that rent sharing is a practice that only arises in labour markets developed economies.

However, there is also recent evidence that multinational firms may also engage in rent sharing across their affiliates in different countries: Budd and Slaughter (2004) and Budd et al (2005). This important area of analysis also presents considerable challenges that will need to be tackled: for instance, the practice of transfer pricing makes it difficult to compare profits of foreign firms across countries.

Another topic for further research may be the differences across specific groups of workers in terms of how much they benefit from rent sharing. Current estimates suggest that workers that tend to benefit the most from rent sharing are also those that are perceived to have more bargaining power: men, more tenured workers, more qualified workers, etc (Black and Strahan, 2001, Fakhfakh and FitzRoy, 2002, Gartner, 2006, Nekby, 2003, Rycx and Tojerow, 2004, Martins, 2004). In this context, rent sharing may have important implications for gender and other types of inequality. Moreover, to the extent that such specific groups of workers are indeed better able to extract wage increases out of their firms' rents, lack of competition in the labour market can be seen as a source of such wage differentials.

However, a related question is whether product market deregulation will necessarily generate less rent-sharing. This is a matter that can also be considered from the point of view of how firms adjust the structure of incentives faced by their workers when product market competition evolves. For instance, Cunat and Guadalupe (2005), using UK data, find evidence that higher level of product market competition increases the performance-pay sensitivity of compensation schemes, in particular for executives. If this result were to hold also in the context of rent sharing, then one may predict that, on average, while rents to be shared fall, the sensitivity of wages with respect to rents increases. Depending on how rent sharing is measured, rent sharing could even increase with increasing competition.

Another important point concerns the differences between rent and risk sharing. While most correlations between profits and wages are perceived as evidence of rent sharing, some recent research (Oyer, 2004) suggests that firms may instead be splitting the risks of their business, so that wages go up when profits increase, but wages can also go down if firms have losses (or, more generally, if their profits fall)<sup>3</sup>.

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3. Some authors have attempted to address this alternative interpretation by checking for any asymmetries as to how wages change when profits increase or decrease. However, Arai (2003) and Martins (2004) find evidence that risk sharing may not be important, at least to the extent that, when focusing only on firms whose profits increase, the estimates of rent sharing increase substantially with respect to the case when considering all firms. This suggests an asymmetry in which wages increase with rents but do not fall with losses.

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