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Rent Sharing and Inclusive Growth

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Abstract

The long-run evolution of rent sharing is empirically studied. Based upon a comprehensive and harmonized panel of the top 300 publicly quoted British companies over thirty five years, the paper reports evidence of a significant fall over time in the extent to which firms share rents with workers. It confirms that companies do share their profits with employees, but at much smaller scale today than they did during the 1980s and 1990s. This is a robust finding, corroborated with industry-level analysis for the US and EU. The decline in rent sharing is coincident with the rise of product market power that has occurred as worker bargaining power has dropped. Although firms with more market power previously shared more of their profits, they experienced a stronger fall in rent sharing after 2000.

Keywords: Rent sharing; Inclusive growth.

JEL Code: J30.

I. Introduction

Stagnating real wages and falling labour shares across developed economies have stimulated a renewed interest in the question of how, and to what extent, rents are shared with labour (Krueger, 1999; Gollin, 2002; Fleck et al., 2011; Pessoa and Van Reenen 2013; 2014; Karabarbounis and Neiman, 2014; Stansbury and Summers, 2017; Bridgman, 2017). When workers receive less from what they produce, and rents are re-directed towards concentrated capital, inequalities rise as economic growth is no longer inclusive (Piketty, 2014).

The recent literature initially tended to focus on the macro- or sectoral-level determinants of labour share, highlighting the influence of technology (Acemoglu, 2003a, Karabarbounis and Neiman, 2014; Lawrence, 2015), trade (Autor et al., 2014; 2016) and institutions (Acemoglu, 2003b). However, since the wage-setting process is the domain of companies, an increasing number of studies have turned their attention to firms (Card et al. 2018). Several authors connect falling firm labour share with growing market concentration and the emergence of 'superstar' companies (Autor et al., 2017; Barkai, 2016; De Loecker and Eeckhout, 2017; Adrjan, 2018). The question is why more market power translates into a lower labour share? A classic account is that workers lose bargaining power, and therefore reduced rent sharing (Nickell and Wadhwani, 1990). However, and at least in part owing to a lack of data, the reality is that little is known about long-run changes in rent sharing.

This paper aims to redress this by looking at the long-run evolution of rent sharing among UK-domiciled companies. In a perfectly competitive labour market there should be no relationship between firm-level wages and productivity, because firms take market wages as given. The extensive empirical literature of the past, however, consistently showed there to be a positive effect of firm rents on average worker compensation (e.g. Nickell and Wadhwani, 1990; Van Reenen, 1996). This is also the case in the newer revival of interest in rent sharing (e.g. Card et al., 2018; Kline et al., 2018). The most common explanation relates this effect to the bargaining power of workers, which allows them to claim a portion of a firm's rents. Knowing how rent sharing has evolved over time can therefore help understand changes in the position of workers within companies and shed light on the mechanisms behind the fall in the labour share.

To examine the long run shifts, the primary analysis is based upon the construction of a comprehensive and consistent panel of the top 300 companies by market capitalisation listed on the London Stock Exchange from 1983 until 2016. Firm-level information was manually collected from annual reports and combined with various existing databases. The construction of the dataset ensures the coverage of the entire economy and limits the sample selection bias. Overall, the panel consists of 843 firms, which together employ over 7 million workers worldwide (2016) and constitute around 95% of total UK market capitalization. The data in the sample refers to the global operations of UK-domiciled companies. The analysis is complemented through the study of data on domestic UK operations, from a panel of UK manufacturing companies from the Annual Respondents Database and the Annual Business Survey.

The empirical approach draws on and extends beyond the older and newer rent sharing literatures. To begin with, the rent-sharing coefficient is estimated using a dynamic firm fixed-effect model, which controls for all time-invariant firm characteristics. In particular, it comes from a regression of log compensation per employee on contemporaneous and lagged profits per employee, and measures of external forces (the unemployment rate, industry-level wages, and time fixed effects). Potential endogeneity is dealt with by instrumenting the lagged dependent variable and the current and lagged profits in the first-differenced model with their lagged levels (Arellano and Bond, 1991).

Based upon these conventional means of estimating the degree of rent sharing, the first result to emerge is of a positive and statistically significant rent-sharing parameter. Estimating over the whole sample this rent sharing elasticity is fairly modest in magnitude, and towards the lower end of estimates from other firm-level studies (Card et al., 2018). The second, more novel result concerns the time series evolution of rent sharing. There is a substantial fall in the long-run elasticity from 0.043 in the period 1983-2000 to 0.012 in the period 2001-2016. The finding of a significantly reduced rent sharing parameter proves robust to various specification checks and alternative definitions of the sample. Moreover, the same result emerges for the panel of UK manufacturing companies, which provides data on domestic operations only. In addition, industry-level data for the US and for nine EU countries again show the same pattern. Consistent with the firm analysis, there is a strongly falling correlation between log compensation per employee and profits per employee for almost all countries since the early 2000s (EU) and the 1970-80s (US).

The final part of the study moves on to mechanisms. A firm-level measure of market power (market share) is computed and used to explore the extent to which companies with higher market power share more or less of their profits. First, and consistent with recent work (Autor et al., 2017; Barkai, 2016; De Loecker and Eeckhout, 2017; Hall, 2018)[1] median market share increases among UK companies since 1983. Second, companies with higher market power share on average more of their rents than companies with low power. Third, the positive association between market power and rent sharing is significantly weaker in the period 2001-2016 compared to 1983-2001. In other words, the fall in rent sharing was more pronounced among the companies which enjoy monopolistic markups.

The findings have implications for the debate on the future of labour. A decline in rent sharing implies growing labour market inequalities and may encourage calls for

[1] For an opposite view that criticises the detail of this work, see Traina (2018). Hall (2018) looks at the issue in a different way, computing shifts in market power from industry price/marginal cost markups (in similar ways to his earlier classic study of market power), concluding similarly to De Loecker and Eeckhout (2017) that markups have risen through time in the US, but not at quite the same rate as their study (where costs are measured only using accounting information on costs of goods sold).

a bigger role for redistributive policies. It also suggests a fundamental change in the competitiveness of the labour market. A weaker bargaining position of workers might be a result of technological change ('robocalypse'), higher labour mobility and institutional change (e.g. decline in unions). Finally, companies with higher market power experience relatively larger falls in rent sharing, suggesting that competition policies should also be analysed from the labour market perspective. As these companies are increasingly global, one might expect these trends to become world-wide phenomena.

The rest of the paper is organised as follows. Section II briefly discusses the related theoretical and empirical literature on the links between firm rents and wages. Section III provides details of the data construction and presents summary statistics on performance and compensation in the sample. The firm-level results are presented in Section IV and the industry-level results in Section V. Section VI provides evidence for the links between market power and the fall in rent sharing. Section VII concludes.

II. Rent Sharing

II.A. Theoretical Considerations

A positive correlation between wages and profit is not a feature of a standard perfect competition model. Wages are given and do not depend on firm characteristics. If a company experiences a productivity or demand shock, it will increase employment, but keep wages fixed. In more realistic models, a portion of the shock is captured by workers in the form of higher wages. There are at least three ways this result can occur (Blanchflower et al., 1996). The first is a monopsonistic model with an upward sloping short-run labour supply curve. The second is an incentive pay model, where risk-averse workers and firms share gains and losses. The third approach incorporates a wage bargaining process between workers and firms.

In the monopsonistic model with an upward sloping short-run labour supply curve, a positive correlation between wages and profits appears only in the short run because of a demand shock. When the economy is hit by a positive shock, companies move up along the supply curve, and profits will rise together with employment and wages. As long as the elasticity of labour demand is less than unity, profits per worker and wages will increase at the same time and this co-movement disappears once the economy reaches a new equilibrium. However, the evidence suggests that rent sharing is a long-run phenomenon (e.g. Nickell and Wadhwani, 1990; Blanchflower et al., 1996; Van Reenen, 1996; Hildreth and Oswald, 1997).

The incentive pay model with job contracts that share gains and losses between risk-averse firms and workers is characterized by equilibrium rent sharing. When effort is hard to monitor, but output observable (e.g. sales), it might be optimal to offer a piece rate pay scheme, which directly links wages with the output. Because the level of output is only partially explained by a worker's effort, one can observe a positive correlation between wages and productivity shocks in the short and long run (Baily, 1974; Azariadis, 1975; Lazear, 1986; Brown, 1990). The problem with this hypothesis is that piece rate systems are rarely used outside very specific occupations and jobs.

Given the shortcoming of the two previous theories, the most widely used approach assumes a bargaining model over wages. Suppose employees wish to maximize the difference between their firm's wages w and the outside option $\overline{w}$. Let ϕ denotes the bargaining power of employees. Firms maximize profits $\pi = f(y) - rk - wn$. Employees and firms engage in a Nash bargain, with a standard maximization problem:

$$max[\phi \ln[(u(w) - u(\overline{w}))n] + (1-\phi)\ln(\pi)]$$

In the event of a bargaining breakdown, the firm earns zero profits and the employees earn the outside option. The first-order condition with respect to wages is:

$$\frac{n\phi u'(w)}{(u(w) - u(\overline{w}))n} - \frac{n(1-\phi)}{\pi} = 0$$

Using a first order Taylor approximation formula: $u(\overline{w}) \cong u(w) + (\overline{w} - w)u'(w)$, one can rewrite the above equation to produce:

$$w \cong \left(\frac{\phi}{1-\phi}\right)\frac{\pi}{n} + \overline{w}$$

This equation relates the firm's wages with the outside option, the worker's bargaining power and the firm's profits per employee. The outside option depends on market wages in other companies (w^o) and the unemployment rate (U) – the probability of finding an alternative job. The insider force is profit per employee. The equilibrium wage can be then expressed as a function of all the above factors:

$$w = W(w^o, U, \phi, \pi, n)$$

This relationship motivates the main empirical specification described in Section IV.

II.B. Existing Empirical Evidence

There is by now a vast literature investigating the relationship between wages and profits. The early studies used a panel of US manufacturing industries. Katz and Summers (1989) find evidence for a positive and significant correlation between wages and profits, with an implied rent-sharing elasticity of around 0.04. Since profitable industries might employ more high-skill workers, it is important to control for the time-varying quality of the workforce. Blanchflower, Oswald and Sanfey (1996) supplement the industry data with measures of worker quality from the CPS and estimate the rent-sharing coefficient between 0.01 and 0.06. Estavao and Tevlin (2003) use similar data but find a much larger elasticity of 0.14 when rents are instrumented with demand shocks in downstream sectors.

An increased focus on firm-level studies arose during the 1990s after a series of influential papers analysing British companies. Nickell and Wadhwani (1990) use a panel of the UK listed firms from 1975 to 1982 and estimate the elasticity in the range of 0.068-0.093. In follow-up work, Nickell, Vainiomaki and Wadhwani (1994) find no relationship between product market power and rent-sharing. In an early attempt to account for the potential endogeneity problem between wages and firm performance, Van Reenen (1996) employs a measure of technology innovations (patents) as an instrument for quasi rents in a panel of large British manufacturing firms. The author finds that instrumenting rents more than doubles the rent-sharing elasticity, from 0.11 to 0.29. These findings were later confirmed by Hildreth and Oswald (1997) and Hildreth (1998), who report the elasticity in the range of 0.02-0.03 when rents were instrumented with lagged values, and much larger - around 0.17 - when instrumented with a measure of innovation. Similarly, Abowd and Lemieux (1993) using a panel of Canadian collective bargaining agreements, find a zero correlation between quasi-rents and negotiated wages in a simple OLS regression, but a large elasticity of 0.22 when quasi-rents are instrumented with industry import and export prices.

More recently there has been a revival of interest in rent sharing. The newer studies often exploit employee-employer matched data and document a relatively small elasticity of individual wages with respect to firm-level measures of rents. Drawing on a Portuguese panel of workers and firms, Cardoso and Portela (2009), Martins (2009) and Card, Cardoso and Kline (2016) find an elasticity in the range of 0.03-0.09, even when rents are instrumented with a potential exposure to export shocks (Martins, 2009). Using an administrative data set from Italy, Guiso, Pistaferri and Schivardi (2005) and Card, Devicienti and Maida (2014) document an elasticity ranging from 0.06 to 0.08, with rents instrumented by firm-averages of sales and workers from other Italian regions (Card et al., 2014). Bagger, Christensen and Mortensen (2014) use Danish data to show heterogeneity in rent sharing across industries, with the elasticity between 0.05 and 0.13 – with trade at the upper end of the spectrum and transportation and communication at the lower end. Elasticities within the range of 0.01-0.12 are also reported in France (Margolis and Salvanes, 2001; Fakhfakh and FitzRoy, 2004), Germany (Guertzgen, 2009) and Sweden (Arai, 2003; Arai and Hayman, 2009; Carlsson, Messina and Skans, 2016).

The availability, and if available validity, of instrumental variables estimates in this literature remains a contentious issue. Studies that exploit firm-level variation in a plausibly exogenous instrument tend to suffer from a weak instrument problem. As a result, most studies instrument firm-level rents with industry-level rents. As Manning (2010) points out, if labour has an industry-specific component and there is a positive shock to industry profits, then this raises the demand for labour in a competitive model and should lead to higher wages (represented by a rise in $\overline{w}$ in the above equation). In such a case, it is not clear that industry-level rents serve as a valid instrument for firm-level rents. In most of this paper, Arellano-Bond estimates based upon two-period (and before) lags to instrument are used. However, estimates using a leave-out industry measure as an instrument for firm-level rents are also reported, with similar findings emerging.

Maybe surprisingly, not many studies have investigated the evolution of rent sharing. The likely reason is the lack of a consistent firm-level panel which would be long enough to capture changes, that would be comprehensive enough to cover all sectors and that include information on compensation and profits. For instance, US company-level data from Standard and Poor's (S&P) Compustat goes back to the 1960s. However only a small (and changing) subset of firms contains information on compensation, as disclosure of this information is not obligatory. A notable exception is a study by Bell and Van Reenen (2011), which uses the matched US manufacturing worker-industry data from the Current Population Survey (CPS) and National Bureau of Economic Research (NBER) Productivity Database. The authors report an elasticity of around 0.05 in the period between 1964 and 1985, which falls to zero between 1986 and 2005. Benmelech, Bergman and Kim (2018) also report a fall in the elasticity of wages with respect to labour productivity between 1977 and 2009 for US manufacturing companies.

Overall, the literature shows that the predictions of the perfectly competitive model that wages do not depend on firm's rents is not supported in the data - a proportion of rents has been shared with workers. Across various countries and industries, the rent-sharing elasticity is usually estimated to be below 0.10, but this estimate tends to increase when instrumental variables are used. Due to the lack of data, however, very little is known about the temporal evolution of rent sharing. In the following sections, a novel dataset on UK-domiciled firms is used to fill this gap.

III. Data

III.A. Firm-Level Data

UK publicly listed companies have been required to report staff costs in their company accounts since 1983. However, the existing datasets on listed companies (e.g. Worldscope) have very poor coverage of the 1980s and early 1990s. The alternative is to use official surveys of firms, but until 1995 the surveys were either short lived (e.g. Cambridge DTI) or were limited to only the manufacturing sector (e.g. ARD). Since the existing data are not suitable for the research questions posed here, instead a comprehensive and consistent panel of British public companies was constructed by drawing from published annual reports and existing databases.

The top 300 companies by market capitalization listed on the London Stock Exchange (LSE) between 1983 and 2016 are studied. To obtain these data, several steps were taken. First, the universe of listed companies was obtained from the London Share Price Database (LSPD), which records information on all listings that have been traded on the London Stock Exchange since 1955. The universe of listings was restricted to only those domiciled in the UK and exclude investment trusts, unit trusts and real estate trusts, as well as secondary shares. The black lines in Figure 1 display the total and selected number of firms listed on the LSE in the sample window (1983-2016). The population of companies is on average 27% smaller than the raw number of listings, but the two series have an almost identical evolution. Next, for every year between 1983 and 2017 the top 300 companies by market capitalization were selected, but those in the top for less than three years in total were excluded. Having established the list of companies, data were collected for all years (within 1983-2016) when a company was publicly listed, even when it was outside the top 300. The resulting panel consists of 13,512 observations for 843 companies, which together employ over 7 million workers worldwide (2016) and constitute around 95% of total UK market capitalization. The construction of the dataset ensures coverage of the entire economy and limits the sample selection bias. This is of crucial importance for the long-run analysis given the dramatic shift of employment from manufacturing to service sectors over the sample period. In the remainder of the paper this panel is referred to as the 'top 300' sample.

The grey line in Figure 1 shows the top 300 sample size in comparison to the total number of companies listed on the LSE. Figure 2 decomposes the sample into observations that are at the top in a given year and observations outside the top (but are at the top in another year). By construction, the number of observations peaks in the middle period (1994-1998) because that period captures three types of companies: companies at the top in that period, companies at the top in the beginning of the time window (which are still alive in 1994-1998) and companies at the top in the end of the window (which already existed in the 1990s). The edges of the window (e.g. 1983 or 2016) have fewer observations as they capture fewer of those companies which were at the top in other years. The fluctuation in the number of companies at the top (the dashed line) is a result of the rule that companies must be at the top for at least three years to enter the sample. In particular, the dot-com bubble of 1999-2001 created a lot of high-valued but short-lived tech companies.

The LSPD contains limited information on a firm's characteristics and accounts. Financial data were collected either manually from annual reports or from existing datasets. The main data provider is Thomson Reuters Worldscope, complemented with S&P Compustat, Exstat, Bureau van Dijk (BvD) ORBIS, BvD FAME and Cambridge DTI. Company-years were matched across the dataset using unique identifiers (SEDOL and ISIN) and company name. Over 1,700 company-years in the sample are not covered by the existing datasets, variables were manually collected from scans of published financial reports available at Mergent Archive and Companies House.

When looking at more than thirty years of data, changes in the formal organization of companies are the norm rather than the exception. Most of the companies in the sample encountered some form of reorganization, merger or acquisition (M&A). This often leads to a discontinuous change in wages and profits per employee, which might introduce noise into the estimates. Whenever a company takes over another one and a new legal entity is created, the time series of the two companies are separated out and given a specific id/fixed effect for the new entity (if publicly listed). In many cases, however, the takeovers are relatively minor and do not result in substantial legal changes (except for the purchased company, which disappears). These cases were manually identified and a dummy variable control for them was incorporated into regressions.

The data in the ‘top 300’ sample refers to the global operations of UK-domiciled companies. To see whether the main results hold for domestic operations, a panel of UK manufacturing (production sector) companies was set up using data from Annual Respondents Database (ARD) for 1979 - 2008 and Annual Business Survey (ABS) for 2008 - 2018.[2] Although the companies might operate in many countries, the ARD and ABS focus exclusively on the UK operation. The data include all companies larger than 250 employees[3] and an annual sample of smaller ones. However, numerous companies with employment around the cut-off were occasionally dropping in and out of the main sample, and for this reason, only firms with employment larger than 300 and for which data availability was for at least four years were considered. After these adjustments, the sample consists of 36,912 firm-year observations for 3,409 firms.

The main measure of rents is profit before tax per employee. Since profits are very volatile and outliers might drive the results, the approach used in Card et al. (2014) was followed and for every year observations with profits per employee outside the 1st-99th percentile range were trimmed.

The wage bargaining model outlined in Section II demonstrated that the wage-setting process is a function of ‘outsider’ forces. These are accounted for by including the industry average wage and the nationwide unemployment rate. The data on the industry average wage comes from the UK files of EU-KLEMS and the unemployment rate comes from the ONS. For the panel of manufacturing companies from ARD and ABS, data on regional-level unemployment rates were matched from the Labour Force Survey (1979-1991) and NOMIS/LFS (1992-2016). The data on regional-level average hourly wages come from the New Earning Survey Panel Database (NESPD).

[2] ARD until 1997 has only data on companies from production sector. Since 1998 ARD and ABS cover the entire economy, but we only keep the production sector for consistency.

[3] To be more precise. All firms larger than 250 are included since the survey year of 1998. Between 1995 and 1997 all firms larger than 200 employees, and between 1980 and 1994 all firms larger than 100 employees.

III.B. Industry Level Data

The analysis of industries for nine EU countries (Austria, Denmark, Finland, France, Germany, Italy, Netherlands, UK and Spain) draws from the EU-KLEMS data. For the US, the data source is the NBER-CES Manufacturing Industry Database. Both sources provide information on productivity, employment and compensation. EU-KLEMS covers the entire economy for 28 1-digit (2-digit for manufacturing) sectors and the data are available since the 1990s until 2015 (coverage differs by country). NBER-CES Manufacturing Industry Database is limited only to the manufacturing sector but provides data for 459 industries in the period from 1963 to 2011.

III.C. Descriptive Statistics

Table 1 reports the top five companies based on market capitalization, employment and revenue for 1983, 2000 and 2016 for the top 300 UK firms. In the early 1980s, the UK economy was dominated by the manufacturing sector, with companies such as British Petroleum, General Electric Company or British American Tobacco making it to the top in all categories. Seventeen years later, there is a rise of the banking and finance (HSBC, Aviva, and Prudential), telecommunication (Vodafone) and retail (Tesco, Sainsbury) sectors. Within the manufacturing sector, pharmaceutical firms (GlaxoSmithKline, AstraZeneca) replaced the more traditional electronic and machinery producers at the top. Today, the British 'superstar' companies originate in the financial, banking and business services, such as G4S, Compass Group - the providers of outsourced services. Interestingly, British Petroleum and British American Tobacco are found at the top in 1983 and 2016, which testifies to the continued importance of the oil and tobacco industries.

Table 2 and Figure 3 report the average firm size in the top 300 sample (with trimmed profits). A U-shaped evolution of mean employment since 1983 until today is seen. At the beginning of the 1980s, the average company employed over 15,000 workers and grew until the end of the decade. After a drop to around 13,000 employees in 1994, firm size has experienced undisrupted growth until 2016. Today the average company in the sample has more than 22,000 employees. However, the standard deviation is over twice as large as the mean, indicating a sizeable variation in the firm size – the smallest company in the sample has 5 employees, whereas the largest employs more than half a million. The time-series might be extremely volatile for firms with low employment, and as a robustness check the appendix Table A1 reports results that limit the top 300 sample to companies with at least 50 employees.

Table 2 and Figure 4 document the evolution of mean real revenue, compensation and profit per employee expressed in thousands of £2016 (weighted by employment). Average revenue and compensation per head grew steadily since 1983 until the Great Recession, after which they started falling and, in 2015, they dropped to the levels reported in the early 2000s. The year 2016 witnessed a recovery of revenue and wages. Although the reported numbers refer to global operations, the sample mean annual compensation in 2016 is £34,400, which is close to the UK average for full-time workers. The mean profit per employee is more volatile. The positive trend between 1983 and 2011 was interrupted by the recession of 1991-92, the dot-com bubble of 1999-2001 and the Great Recession. Profits peaked in the years before and after the latter, but since 2011 they have been steadily falling.

IV. Levels and Trends in Firm-Level Rent Sharing

IV.A. Top 300 Companies

The theoretical considerations in Section II concluded with a formulation of the wage-setting process as a function of outside forces (unemployment, industry wages), the bargaining power of workers and profits per employee. In particular, the equation for log wages was as follows:

$$w \cong \left(\frac{\phi}{1-\phi}\right)\frac{\pi}{n} + \overline{w}$$

This equation is taken as the basis for formulating and implementing theempirical strategy, together with introducing a set of modifications to account for potential endogeneity bias. First, the commonality of find long-term employment contracts can generate a certain amount of inertia in wage determination. This possibility is allowed for by inclusion of lagged wages and profits into the equation. Second, firm fixed-effects are included, so as to absorb time-invariant company characteristics affecting firm performance and wages. Finally, the model is first-differenced, which, by construction, leads to a correlation between the lagged dependent variable and the error term (Nickell, 1981). In addition, omitted time-varying firm characteristics might drive the correlation between wages and profits. These two sources of possible bias are coped with by instrumenting the lagged dependent variable and the current and lagged profits in the first-differenced model with their lagged levels (Arellano and Bond, 1991). Overall, the rent-sharing elasticity is estimated using a dynamic firm fixed-effect model of the following form:

$$\log w_{ijt} = \alpha \log w_{ijt-1} + \sum_{l=0}^{L} \beta_l \frac{\pi}{n_{ijt-l}} + \sum_{l=0}^{L} \gamma_l \log U_{t-l} + \sum_{l=0}^{L} \delta_l \log \overline{w}_{jt-l} + f(time) + \mu_i + \epsilon_{ijt}$$

where the outcome variable w_{ijt} is log compensation per employee for company *i*, in industry *j* at time *t*. The variable of interest π/n_{ijt-l} is profit before tax per employee, and μ_i captures all time-invariant firm effects. Two strategies to control for the outside forces are employed. The first controls for the nationwide unemployment rate U_{t-l}, the 1-digit industry (2-digit for manufacturing) log average wage $\overline{w}_{jt-l}$ and for a polynomial time trend (e.g. for a quadratic, $f(time) = \lambda_1 t + \lambda_2 t^2$). The second includes the log industry average wage and year fixed effects, which account for all nationwide time effects (i.e. $f(time) = \mu_t$). Up to three lagged values of profits and the outside forces are included (e.g. as in Blanchflower et al., 1996). In addition, every regression includes a dummy for significant episodes of mergers and acquisitions. Since profits can take negative values, profits per employee are entered in levels, however, the reported coefficients are transformed into elasticities.

In the above model, the short-run (SR) elasticity is captured by the coefficient β_0, that is, the effect of contemporaneous profits on wages. The long-run (LR) elasticity, for the specification with three lags of profits, is given by $(\beta_0 + \beta_1 + \beta_2 + \beta_3)/(1-\alpha)$, since in the long run $\pi/n_{ijt} = \pi/n_{ijt-1} = \pi/n_{ijt-2} = \pi/n_{ijt-3}$ and $w_{ijt} = w_{ijt-1}$.

Table 3 presents baseline estimates for the whole period 1983-2016. Columns 1 to 4 use the unemployment rate, the average industry wages and a quadratic polynomial of time to account for the outside forces. Various different lag structures are explored across the specifications. All columns, except 4, instrument profits with their lagged values. The LR elasticities of pay with respect to profits are estimated within the range of 0.010-0.013 and the SR elasticity within the range of 0.006-0.010. Columns 5 to 8 use the average industry wages and year fixed effects to account for the outside forces. The results remain virtually the same, with the LR elasticity within the range of 0.011-0.013 (SR 0.006-0.009). Specifications without the instrumented profits (columns 4 and 8) produce a smaller elasticity of 0.006-0.007, which is likely due to simultaneity problems with contemporaneous profits. The effects of the outsider forces are consistent with the basic theory. The unemployment rate has a null or negative LR effect on wages, meaning that worse employment prospect create a downward pressure on wages. The average industry wage has a positive impact, indicating an upward pressure on wages, when the outside wage is growing.

The baseline results indicate positive and significant rent sharing among these UK companies. How do these estimates compare to the existing empirical studies? As pointed out by Card et al. (2018), rent-sharing elasticities estimated using profits should be multiplied by the average ratio between value-added and profits (roughly equal to two) in order to compare them to estimates based on value-added or revenue.

After this adjustment, the estimates of LR rent sharing are within the range of 0.020-0.026, which is similar to the UK firm-level estimates from Hildreth and Oswald (1997) and Hildreth (1998), but below the estimates from Nickell and Wadhwani (1990) (0.068-0.093). They are also at the lower end of the estimates typically found using worker-level data, for instance, from Portugal by Card et al. (2018) (0.04-0.05) or from Italy by Card et al. (2014) (0.06-0.08).

Turning to the evolution of rent sharing over time, Columns 1 and 2 of Table 4 look separately at the two sub-periods: 1983-2000 and 2001-2016. According to these estimates, there is a marked fall in rent sharing since 1983. In the period 1983-2000 the LR elasticity is 0.043, which is comparable to the existing estimates from that period (Nickell and Wadhwani, 1990; Hildreth, 1998). However, in the subsequent period 2001-2016, the elasticity is approximately three and half times smaller. How economically significant a fall is this? To assess this, Lester's Range (Lester, 1952), that is the spread of wages which can be attributed to the dispersion of profits, was calculated.[4] Assuming that the distribution of profits is four standard deviations, moving from the bottom to the top of the distribution of profits, increases wages by approximately 45% in the first period, compared to 20% in the second period. In other words, before 2000 almost a half of firm-level wage inequality could be attributed to rents, but after 2000, only one-fifth.[5]

Next, the fall in rent sharing is considered further as Columns 3 to 6 of Table 4 report the estimates for four sub-periods: 1983-1991, 1991-2000, 2000-2009 and 2009-2016.[6] The rationale for such division is to look separately at the periods before and after the significant decline of unions (the early 90s) and at the period after the recent economic crisis (2008-2009). The rent-sharing elasticity in the first period is noisily measured, but large and positive at the level of 0.050. During the 1990s the elasticity falls to 0.035 but is strongly significant. The falling trend continues after 2000, when the elasticity drops to 0.016, and practically reaches zero in the decade after the Great Recession. A similar pattern is reported for the estimates of Lester's Range. At its peak during the 1980s and early 1990's, rent sharing can account for over a half of the firm-level wage inequality, while today only one-tenth.

Finally, the industry-level leave-out mean profits is used as an alternative instrument for firm-level profits. Columns 7 to 10 of Table 4 report the estimates for the four sub-periods. Consistent with the literature, instrumenting profits with the industry-level measures tends to lead to higher estimates of rent sharing (Card et al.,

[4] Lester's Range is defined as the rent-sharing coefficient multiplied four and by the ratio of the standard deviation to the mean of profits (Blanchflower et al., 1996).

[5] Is the observed fall in rent sharing merely a result of attenuation bias? Table 2 reports an increasing number of small companies with potentially more volatile series. As an additional robustness check, in Table A1 we estimate the rent-sharing coefficients only for the sample of companies larger than 50 employees. The results are practically unchanged.

[6] Because the data start in 1983, including too many lags of independent variables in the first-period regression leads to noisy estimates. Therefore the number of lags is restricted to two for all specifications.

2018). The first two periods (1983-1991 and 1991-2000) have a very similar elasticity of 0.060-0.065 and Lester's Range of around 63%. However, in the following two periods (2000-2009 and 2009-2016) there is no evidence of rent sharing.

An additional robustness check compares the estimated changes in the rent sharing coefficients for nine industries, for specifications with and without instrumented profits by the industry-level leave-out means. Each circle in Figure 5 represents the estimated change in the industry-specific rent-sharing coefficient between the two periods 2001-2016 and 1983-2000, the size of circle marks the average (across time) industry share in the total value added. The X-axis is for specifications with industry-level profits as an IV, the Y-axis without. The fitted line is very close to a 45-degrees line. Although instrumenting profits changes the estimated *level*s, Figure 5 shows that instrumenting does not matter for the estimated *changes.*

IV.B. Manufacturing Companies

Modern companies are increasingly global, with boundaries crossing across not only countries, but also continents. Consequently, one should interpret the above results as evidence for UK-*domiciled* companies, since many firms in the sample have operations extending beyond the border. While this analysis is still informative about rent sharing in the British economy, it can be complemented with a similar analysis of domestic operations from the panel of UK manufacturing companies. The same methodology as previously is adopted, with exception that the outsider effects (i.e. average wages and unemployment) are now defined at the regional level. In particular, the model now becomes:

$$\log w_{irt} = \alpha \log w_{irt-1} + \sum_{l=0}^{L} \beta_l \frac{\pi}{n}_{irt-l} + \sum_{l=0}^{L} \gamma_l \log U_{rt-l} \sum_{l=0}^{L} \delta_l \log \overline{w}_{rt-l} + f(time) + \mu_i + \varepsilon_{irt}$$

where i indexes firms, r stands for region and t indicates time. The remainder of the notation is the same as previously.

Columns 1 and 2 of Table 5 present the estimates for the whole period 1983-2016. Three lags of each independent variable are included. Column 1 includes a second-order polynomial of time, column 2 includes year fixed effects. The LR elasticities of pay with respect to profits are estimated between 0.012 and 0.015, with the specification including year fixed effects located at the lower end of the range. These estimates are almost identical to those reported in Table 3 for the top 300 sample over the same period.

Turning to the evolution of rent sharing, Columns 3 to 6 of Table 5 look separately at the four sub-periods: 1983-1991, 1991-2000, 2000-2009 and 2009-2016.

Again there is seen to be a substantial fall in rent sharing since 1983. In the first period the magnitude of the rent-sharing elasticity is almost 0.070. In the following periods, however, the coefficient gradually falls. Between 1991 and 2000 it is 0.037, between 2000 and 2009 it is 0.033, and finally reaches zero after 2009.

Figure 6 summarizes the evolution of the Lester range for the two UK firm-level samples. The lines show a remarkable similarity, indicating that the dramatic fall in rent sharing was a characteristic of the whole economy and was not unique to global UK-domiciled public companies or the domestic manufacturing sector. The next section shows that the fall in rent sharing is, in fact, also visible for EU and US industries.

V. Levels and Trends in Industry-Level Rent Sharing

V.A. Evidence from EU Industries

The firm-level data show that the rent-sharing coefficient has been falling for the global operations of UK-domiciled companies from all sectors, and for the domestic operation of UK-based manufacturing companies. In this section, industry-level data, which allow study of domestic operations across all sectors for the UK and other advanced economies, are analysed.

The starting point is an analysis of the EU-KLEMS industry-level data, which provides information on wages and rents for the same 28 industries across EU countries since the 1990s until 2015[7] (O'Mahony and Timmer, 2009; Jäger, 2016). The UK and eight countries for which the data goes back to the early 1990s (Austria, Denmark, Germany, Italy, Finland, France, Netherlands, and Spain) are studied. The evolution of rent sharing for all the pooled countries and industries comprising a panel of 25 years (*T*) of data for 28 industries (*N*) is considered. Of course, these data are "small *N,* large *T*" and therefore not feasible for Arellano-Bond estimation and, in general, for dynamic panel models (Roodman, 2009). Therefore, long-run changes in wages are regressed on long-run changes in rents measured by profits per worker:

$$\log \overline{w}_{jct} - \log \overline{w}_{jct-l} = \beta \left(\frac{\overline{\pi}}{n_{jct}} - \frac{\overline{\pi}}{n_{jct-l}} \right) + \mu_j + \mu_c + \epsilon_{jct}$$

where $l = 14$ if $t = 2005$ and $l = 10$ if $t = 2015$.

The outcome variable w_{jct} is log compensation per employee in industry *j* from country *c* at time *t*. The variable of interest π/n_{jct} is profits per employee. Country (μ_c) / industry fixed effects (μ_j) are included. The time breakdown is the fourteen-year change 1991-2005 and the ten-year change between 2005 and 2015. In order to

[7] We do not include the 1970s and 1980s, as the provided numbers are estimates.

reduce measurement error, wages and profits for each year are smoothed and replaced with the three-year moving average $\overline{w}_{jct}$ and $\overline{\pi}/n_{jct}$.

Table 6 presents the estimates of the rent-sharing coefficient for pooled industries and countries (the coefficient β).[8] Each row displays results for separate periods, for instance, the first row shows the effect of the change between 1991 and 2005 in profits per employee on the change in the same period in log wages. In the first period, the correlation between profits and wages, 0.0012-0.0019, is consistently positive and significant. It corresponds to a Lester Range of 3-5%. In the second period, the estimates are practically zero. Interestingly, the inclusion of industry and country fixed effects matters little for the estimates, suggesting that the fall of rent sharing cannot be explained by a shift from high to low rent-sharing sectors or country-specific changes.

V.B. Evidence from US Manufacturing

The evolution of rent sharing in the US is studied using the NBER-CES Manufacturing Industry data for the period from 1963 to 2011. Although the data covers only the production sector, it allows us to use 459 4-digit industries and avoid the "small *N*, large *T*" problem. The rent-sharing elasticity is produced in a similar fashion as it was in the firm-level analysis by using a dynamic industry fixed-effect model of the following form:

$$\log w_{jt} = \alpha \log w_{jt-1} + \sum_{l=0}^{L} \beta_l \frac{\pi}{n}_{jt-l} + \sum_{l=0}^{L} \gamma_l \log U_{t-l} + \sum_{l=0}^{L} \delta_l \log \overline{w}_{jt-l} + f(time) + \mu_j + \epsilon_{jt}$$

where the outcome variable w_{jt} is log compensation per employee for manufacturing industry *j* at time *t*. The variable of interest π/n_{jt-l} is profit before tax per employee and μ_j captures time-invariant industry effects. Outsider forces are either controlled for via inclusion of the log nationwide unemployment rate U_{t-l}, the log 2-digit industry average wage $\overline{w}_{jt-l}$[9] and for a polynomial of time, or by the log industry average wage and year fixed effects. Up to three lagged values of profits and the outsider forces are incorporated. Again the model is first-differenced and lagged dependent variable and the current and lagged profits are instrumented with their lagged levels (Arellano and

[8] We also run regressions for the UK industries only and find very similar levels and evolution of the rent-sharing coefficients as in the pooled sample. The results are available upon request.

[9] Regressing a variable on its group's mean mechanically leads to a coefficient of one for the mean and zero for other variables. To avoid this problem, we use the 2-digit average industry wages from the IPUMS-CPS March files (Flood et al., 2017).

Bond, 1991). The level of profits per employee is used in a log-levels specification, however we transform the reported coefficients into elasticities.

Column 1 of Table 7 reports the estimates for the whole period 1963-2011 for specifications with three lags and year fixed effects. There is a positive and significant rent-sharing parameter with magnitude 0.014 and Lester's Range of 8%. This estimate is, nevertheless, almost five times smaller than those reported in Blanchflower, Oswald and Sanfey (1996) for the shorter period between 1964 and 1985. Can this difference be attributed to a fall in rent sharing after 1985? To check for this possibility, Columns 2 to 6 of Table 7 split the sample into five periods: 1963-1974, 1974-1983, 1983-1991, 1991-2000 and 2000-2011. Results from specifications with the log of average 2-digit industry wages and year fixed effects are reported. The rent-sharing elasticity over the first period (column 1) is 0.054, which is close to the estimates from Blanchflower, Oswald and Sanfey (1996). However already in the 1970s and 1980s (columns 2 and 3) there is a decline to around 0.014. The two most recent periods, 1991-2000 and 2000-2011 are marked by near-zero estimates, implying an almost complete lack of rent sharing in the US manufacturing sector. Lester's Range declines as well, from around 17% in the first period, to around 5.5% between 1974 and 1991 to just 2.5% since 1991. These findings are consistent with Bell and Van Reenen (2011), who use the same data and find no evidence for rent sharing in the period 1986-2005.

Figure 6 summarizes the evolution of Lester's Range for the EU-KLEMS and NBER-CES samples, in comparison with the UK firm-level samples. The results are consistent across samples and show a negative trend in rent sharing. The fall among the US manufacturing industries happened earlier, in the 1970-80s, than in Europe, which experienced a dramatic fall after the turn of the millennium. Finally, the difference in the level of the Lester range and change between the industry and firm-level estimates, stems from the lower rent-sharing coefficients and smaller dispersion of profits at the industry level.

VI. Changes in Rent Sharing, Market Power and Labour Share

The evidence considered so far shows that UK-domiciled companies share profits with workers, but much less so now than they used to. The same pattern emerges for industries in the US and nine EU countries. What has driven this decline? One consistent finding in the recent literature that is focused on the labour share has been the connection between the falling labour share and growing market concentration (Autor et al., 2017; Barkai, 2016; De Loecker and Eeckhout, 2017; Adrjan, 2018). This begs the question whether the observed decline in rent-sharing has been more pronounced among those firms with more market power. This section offers evidence on this question.

To do so, the firm-level data are returned to with an aim to explore whether companies with high market power share more or less of their profits, and whether this has changed over time. Firm market share is the measure of market power that is considered. However, it is often unclear for global companies how to define their market of reference. For supermarket chains that are primarily domestically focused (e.g. Tesco) one could argue that the UK retail sector is an appropriate reference market, but for more global companies (e.g. British Petroleum or HSBC) one should arguably look at the worldwide market. In other words, taking the UK industry revenue or employment from EU-KLEMS could be a valid option for Tesco, but not for British Petroleum. A lack of information on the size of the global operation, generates a need to take an alternative approach and define the company's reference market as the sample's industry total.

Therefore, firm-level market share is the firm's revenue or employment share in the sample's industry total. A composite sample for the industry total is constructed, in order to ensure that changes in sample size do not drive the results. By construction, the size of the sample varies, implying larger industry total for years with more observations. Without correction this would then underestimate market share in the middle of the sample window and overestimate at the ends. To adjust for this, the approach taken in in Nickell (1996) is adopted. This imputes the number of 'outside the top' observations for all years using the sample composition from 1996-1999 (when the sample size peaks). Second, owing to exclusion of companies which were within the top 300 for less than three years, the ends of the sample (1983-84 and 2015-16) have less 'at the top' observations. These are imputed using the sample composition from 1985 and 2014 correspondingly.

Market share for company *i* from industry *j* at time *t* is:

$$MS_{ijt} = \frac{R_{ijt}}{R_{jt}}$$

where the denominator R_{jt} is the sum of revenue for 1-digit (2-digit for manufacturing) industry *j* at time *t*, calculated for the adjusted composite sample. The market share of employment can be computed analogously.

Figure 7 illustrates the growth of the median and the upper quartile of the market share measures since 1983. Market share exhibits a U-shaped evolution through time, which is especially visible for the 75th percentile, which dips in the early 1990s and then peaks after the Great Recession. The median company in 1983 earned and employed around 1.5% of its industry total revenue and employment. Thirty-three years later the median share had grown to 2%.

The same empirical strategy as for the earlier firm-level analysis is adopted, but, in addition, now exploring whether companies with higher market power share more or less of their profits. In particular, profits are interacted with the measure of market share in the following way:

$$\log w_{ijt} = \alpha \log w_{ijt-1} + \sum_{l=0}^{L} \beta_l \frac{\pi}{n}_{ijt-l} + \sum_{l=0}^{L} \vartheta_l MS_{ijt-l} + \sum_{l=0}^{L} \theta_l \frac{\pi}{n}_{ijt-l} \times MS_{ijt-l} + \sum_{l=0}^{L} \delta_l \log \overline{w}_{jt-l} + \mu_t + \mu_i + \epsilon_{ijt}$$

The notation is as in Section IV. For the sake of brevity only the model with time fixed effects is reported (without the nation-wide unemployment rate). The model is estimated separately for the two sub-periods: 1983-2000 and 2001-2016.

Figure 8 displays the long-run rent-sharing coefficients calculated for different moments of the revenue-based market share distributions (i.e. the 10th, 25th, 75th and 90th percentiles). Consistently across time periods, companies with high market power have on average higher rent sharing than companies with low power.[10] However, the positive association between market power and rent sharing is significantly weaker in the period 2001-2016 compared to 1983-2001. In other words, the fall in rent sharing was more pronounced among the companies, which enjoy monopolistic markups. Virtually the same results are obtained using an employment-based measure of market power (available upon request). These results are at best indicative of the role of market power since the differences are not statistically significant and the measure of market power is imperfect, but suggests an interesting area for further research.

VII. Conclusions

Recently, and particularly since real wage stagnation and the sluggish productivity performance of many countries have persisted in the wake of the financial crisis, many commentators have expressed concerns around not achieving inclusive growth. One key feature of inclusive growth that traditionally has been highlighted is whether or not companies share the gains from productivity and higher profits with workers. An older literature that typically utilised data from time periods before wage inequality started rising tended to emphasise that rent sharing was a key feature of the way in which worker bargaining power did in fact redistribute to wages.

This paper presents a range of evidence to show that the extent of rent sharing has declined very sharply over time. And that the decline is, if anything, more marked where firm market power has risen. This is the case for a specially constructed panel of UK publicly listed firms over the period 1983-2016, where the analysis shows that a significant and economically substantial role for profit sharing in wage determination

[10] A positive association between rent sharing and market power is also reported in Card et al. (2014).

in the 1980s and 1990s has vanished since around the start of the new millennium. A similar story holds for the EU and US, though the decline occurred earlier in the US.

These findings are important looking forward if a goal is to figure out the means by which inclusive growth can be generated in advanced countries. Rising firm markups, product market concentration and labour market concentration are all current trends that run counter to this and make it a challenging and difficult aim. Evidently, more needs to be done to better understand the ways that wage setting arrangements of modern corporations operating in a globalised world can be improved to raise productivity and to reward workers in a fair and equitable way at the same time.

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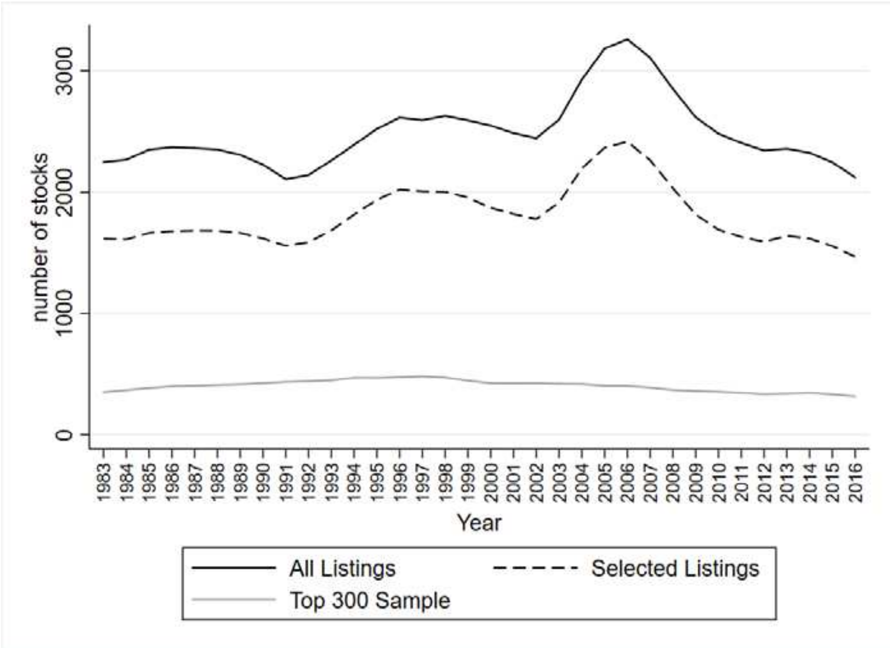
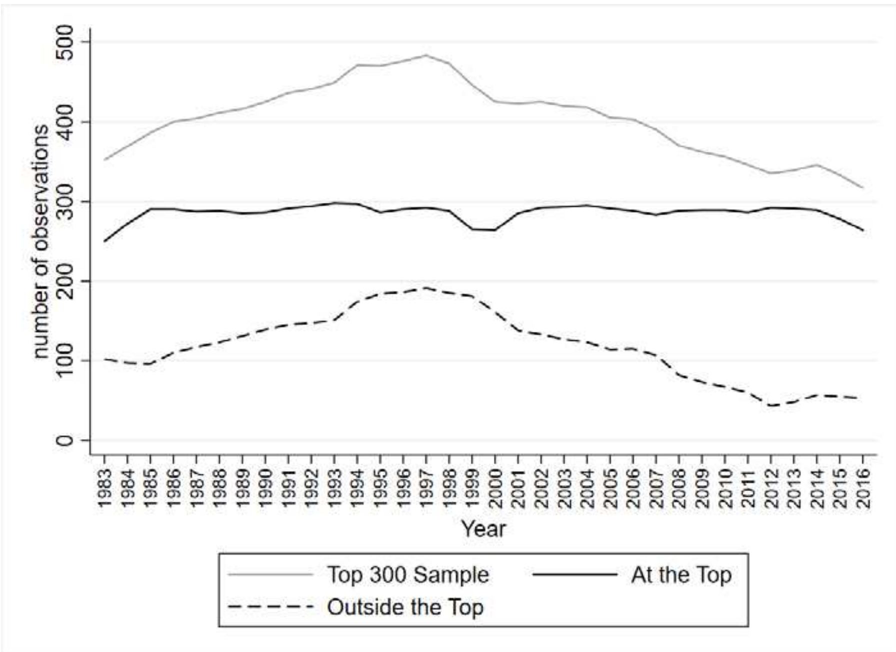
Figure 1: The Number of Listings on the London Stock Exchange



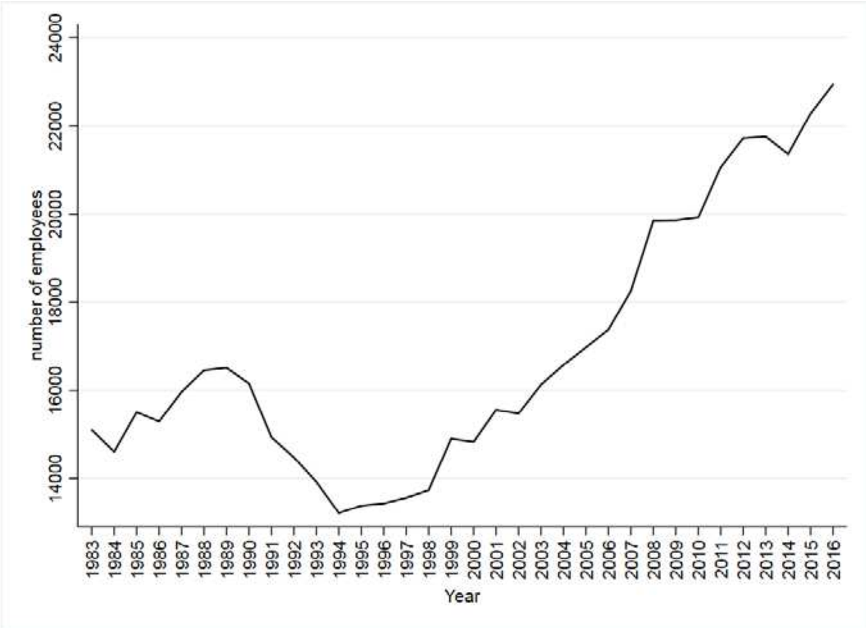
Notes: The black solid line denotes the total number of listings on the London Stock Exchange (LSE). The black dashed line marks the number of listings, which are used to construct the top 300 sample represented by the grey line. See the text for more details on the sample construction. *Source: LSPD, own calculations.*

Figure 2: Composition of the Top 300 Sample



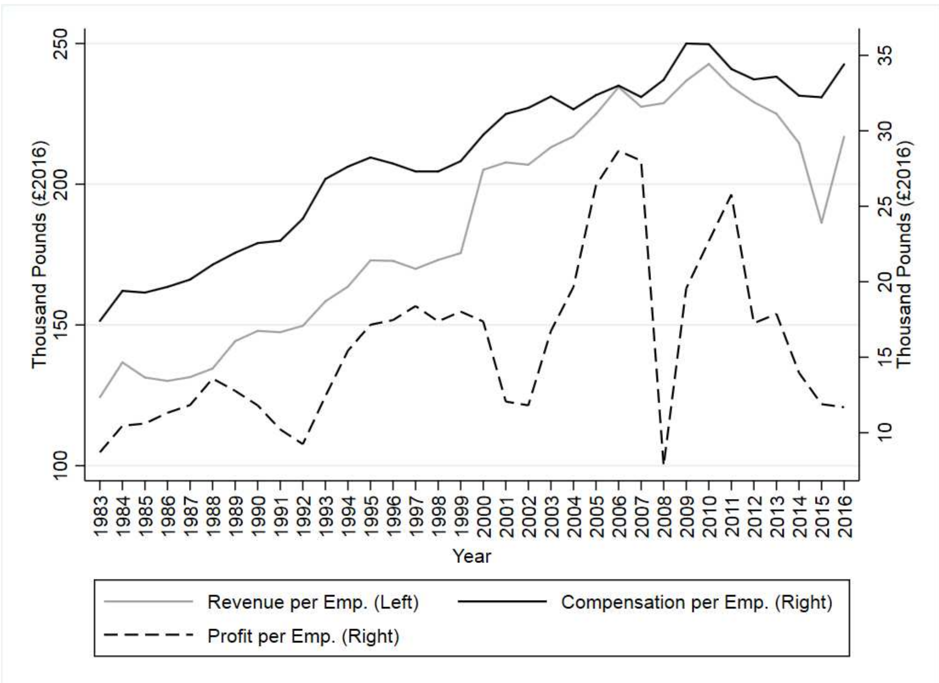
Notes: The grey line denotes the total number of companies in the top 300 sample. The black solid line marks the number of companies, which were within the top 300 in a given year. The black dashed line shows the number of companies, which were not within the top 300 in a given year, but were in the top for some other year between 1983 and 2016. *Source: LSPD, own calculations.*

Figure 3: Mean Employment in the Top 300 Sample



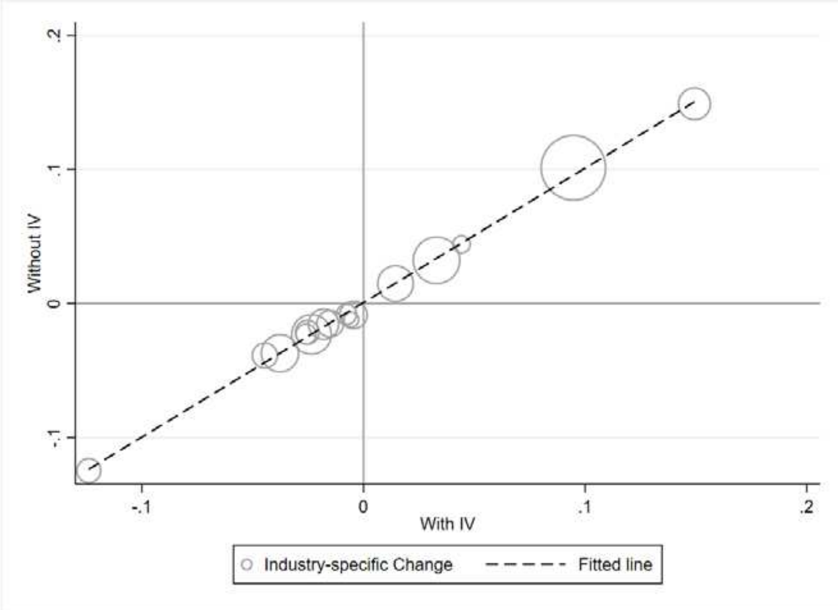
Notes: The graph presents the mean employment for companies in the top 300 sample with trimmed profits per employee (top/bottom 1%). *Source: author's construction based on various sources (see the text).*

Figure 4: Real Revenue, Compensation and Profit per Employee in the Top 300 Sample



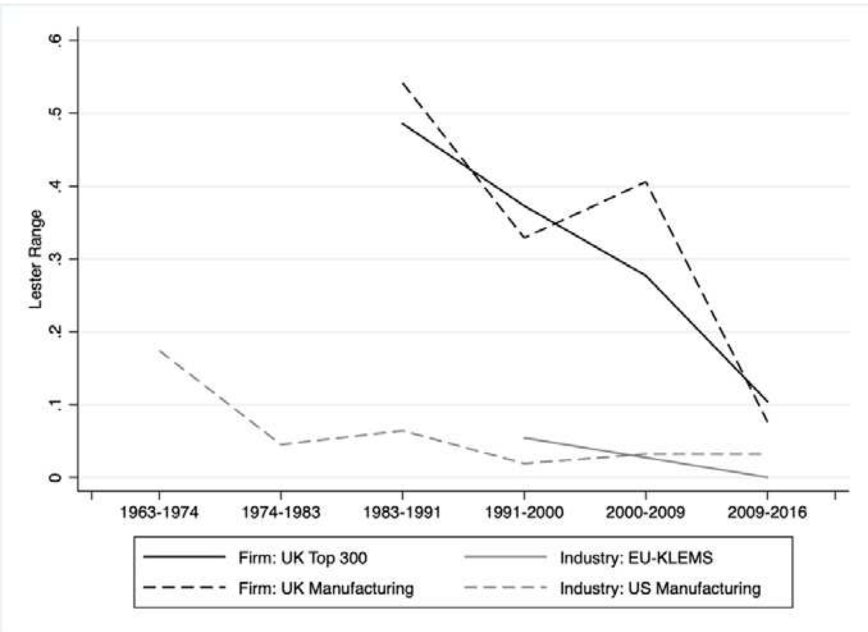
Notes: The graph presents the weighted mean of total revenue, compensation and profit before taxation per employee, deflated by the CPI. The data are for companies in the top 300 sample with trimmed profits per employee (top/bottom 1%). *Source: author's construction based on various sources (see the text).*

Figure 5: Industry-Specific Changes in Rent Sharing



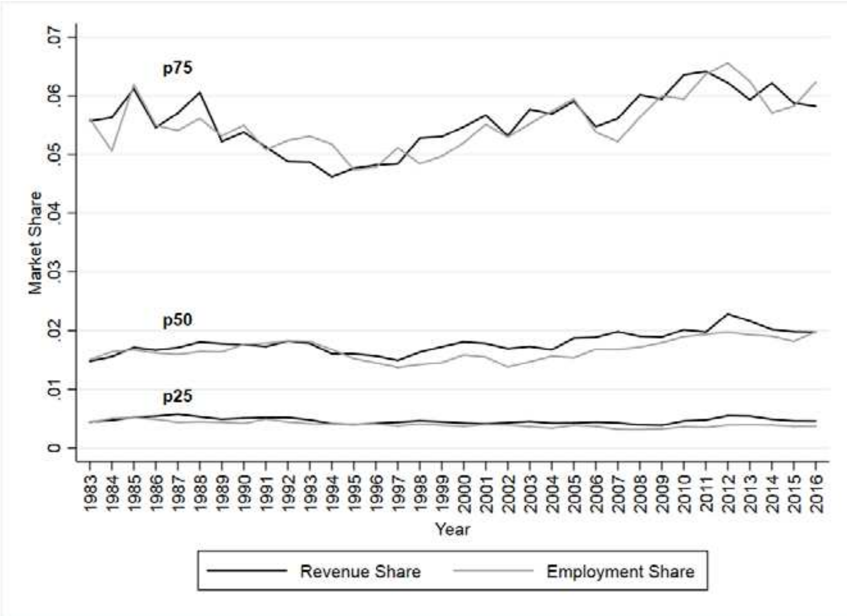
Notes: Arellano-Bond estimates from the first-differenced firm-level regression of log compensation per employee, on the lagged depended variable, profits per employee, the log average industry wages and year fixed effects. Profits were instrumented using the industry-level leave-out means of profits. Each circle represents the estimated change between the two periods 2001-2016 and 1983-2000, the size of circle marks the average (across time) sector share in the total value added.

Figure 6: The Evolution of the Lester Range



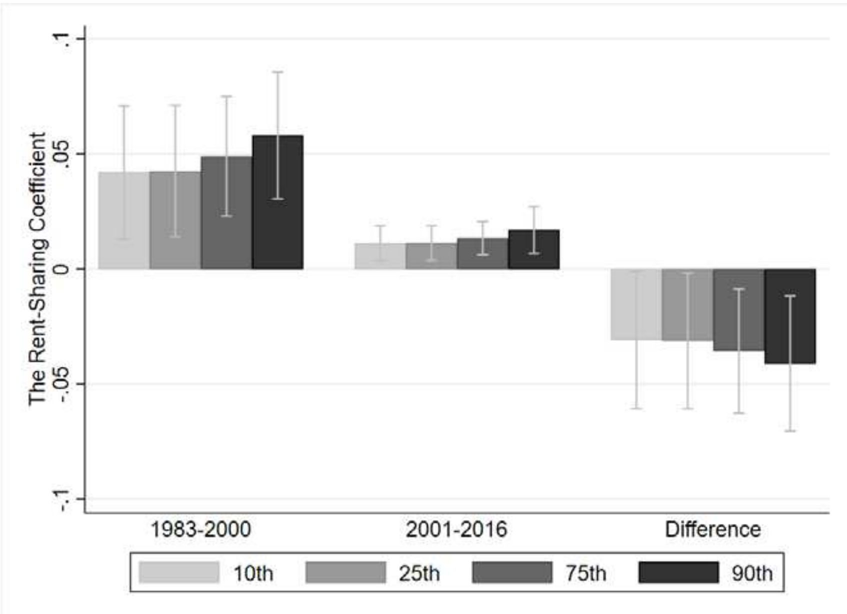
Notes: For “Industry: US manufacturing” the periods 2000-2009 and 2009-2016 are the same and correspond to 2000-2011. For “Industry: EU-KLEMS” the period 2009-2016 corresponds to 2009-2015.

Figure 7: Market Share



Notes: The graph presents the evolution of the 75th (p75), median (p50) and 25th (p25) percentiles of market share. The black lines marks estimates based on revenue. The grey line marks estimates based on employment. Data is for companies in the top 300 sample with trimmed profits per employee (top/bottom 1%). *Source: author's construction based on various sources (see the text).*

Figure 8: Firm-Level Rent Sharing and Market Share of Revenue



Notes: The Arellano-Bond estimates from the first-differenced firm-level regression of log compensation per employee on the lagged depended variable, profits per employee, market share of revenue, the interaction term between market share and profits, the log average industry wages and year fixed effects. Three lags of all independent variables are included. Data are for companies in the top 300 sample with trimmed profits (top/bottom 1%). Standard errors clustered at firm level.

Table 1: Rankings of Companies in the Top 300 Sample

	1983		2000		2016	
	Market Capitalization (in mln)		Market Capitalization (in mln)		Market Capitalization (in mln)	
1	British Petroleum	7421	Vodafone Group	158124	HSBC Holdings	130498
2	General Electric Company	4888	British Petroleum	121844	British Petroleum	99236
3	Imperial Chemical Industries	3880	GlaxoSmithKline	118910	British American Tobacco	86162
4	Marks and Spencer Group	2830	HSBC Holdings	91284	GlaxoSmithKline	76695
5	British American Tobacco	2631	AstraZeneca	59619	AstraZeneca	56137
	Employment		Employment		Employment	
1	British American Tobacco	187173	Unilever	295000	G4S	592897
2	General Electric Company	170865	Anglo American	249000	Compass Group	527180
3	Grand Metropolitan	136297	Sainsbury	185200	Tesco	464520
4	British Petroleum	131600	HSBC Holdings	161624	HSBC Holdings	235175
5	Unilever	127000	Tesco	152210	Sainsbury	181900
	Revenue (in mln)		Revenue (in mln)		Revenue (in mln)	
1	British Petroleum	32381	British Petroleum	97900	British Petroleum	136100
2	Imperial Chemical Industries	8256	Aviva	40244	Legal and General Group	77969
3	British American Tobacco	7904	HSBC Holdings	33182	Prudential	71842
4	Barclays	7888	Unilever	28977	HSBC Holdings	60495
5	National Westminster Bank	6605	Prudential	28078	Tesco	55917

Table 2: Descriptive Statistics

	Year	N	Mean	SD	Min	Max
Employment	**1983**	337	15104	25974	27	187173
	2000	413	14831	30645	22	295000
	2016	307	22939	59283	5	592897
Compensation per Employee (in th £2016)	**1983**	323	18.6	7.5	1.8	75.4
	2000	413	29.7	16.0	0.6	315.8
	2016	307	34.4	24.4	1.1	525.0
Revenue per Employee (in th £2016)	**1983**	333	124.4	119.6	11.4	4734.2
	2000	413	205.1	262.1	2.9	7958.4
	2016	307	216.9	458.1	0.0	9447.4
Profit per Employee (in th £2016)	**1983**	337	8.7	9.4	-0.1	408.4
	2000	413	17.4	30.7	-160.9	1092.2
	2016	307	11.7	33.5	-722.3	914.5

Notes: Compensation, Revenue and Profit before taxation per employee are deflated by the CPI and expressed in £2016. The data are for companies in the top 300 sample with trimmed profits per employee (top/bottom 1%). *Source: author's construction based on various sources (see the text).*

Table 3: Firm-Level Rent Sharing 1983-2016

Dependent Variable: Log w_{ijt}

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log w_{ijt-1}	0.477***	0.488***	0.43***	-0.177***	0.478***	0.494***	0.445***	-0.187***
	(0.034)	(0.034)	(0.052)	(0.028)	(0.035)	(0.036)	(0.054)	(0.028)
$\pi/n_{\ ijt}$	0.006***	0.008***	0.01***	0.008***	0.006***	0.008***	0.009***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
$\pi/n_{\ ijt-1}$	-	-0.002**	-0.003	0	-	-0.002*	-0.003	0.001
		(0.001)	(0.002)	(0.003)		(0.001)	(0.002)	(0.003)
$\pi/n_{\ ijt-2}$	-	-	0.002	0	-	-	0.002	0.001
			(0.002)	(0.001)			(0.002)	(0.001)
$\pi/n_{\ ijt-3}$	-	-	-0.001	-0.002**	-	-	-0.001	-0.002**
			(0.001)	(0.001)			(0.001)	(0.001)
Log $\overline{w}_{\ ijt}$	0.004	-0.017	0.018	0.005	0	0.001	0.011	0.006
	(0.008)	(0.016)	(0.017)	(0.012)	(0.009)	(0.018)	(0.019)	(0.012)
Log $\overline{w}_{\ ijt-1}$	-	0.045	-0.048	-0.021	-	0.005	0.003	-0.007
		(0.03)	(0.03)	(0.015)		(0.038)	(0.036)	(0.015)
Log $\overline{w}_{\ ijt-2}$	-	-	0.11**	0.03	-	-	0.102	0.004
			(0.054)	(0.019)			(0.074)	(0.02)
Log $\overline{w}_{\ ijt-3}$	-	-	0.014	0.074***	-	-	-0.054	0.039
			(0.053)	(0.025)			(0.07)	(0.026)
Log U_{ijt}	0.005	0.043***	-0.006	0.025*	-	-	-	-
	(0.009)	(0.013)	(0.015)	(0.015)				
Log U_{ijt-1}	-	-0.047***	-0.034	-0.029*	-	-	-	-
		(0.013)	(0.022)	(0.016)				
Log U_{ijt-2}	-	-	0.109***	0.066***	-	-	-	-
			(0.024)	(0.019)				
Log U_{ijt-3}	-	-	-0.124***	-0.048***	-	-	-	-
			(0.018)	(0.016)				
LR Coefficient	**0.011**	**0.010**	**0.013**	**0.006**	**0.011**	**0.011**	**0.013**	**0.007**
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Lester Range	**0.158**	**0.144**	**0.183**	**0.093**	**0.160**	**0.155**	**0.182**	**0.108**
Firm-Years	11478	11380	9751	9751	11478	11380	9751	9751
Firms	832	829	731	731	832	829	731	731
Time	Quad	Quad	Quad	Quad	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	No	Lag(2/.)	Lag(2/.)	Lag(2/.)	No

Notes: OLS (Columns 4 and 8) and Arellano-Bond estimates from the first-differenced firm-level regression of log compensation per employee, on the lagged depended variable, profits per employee, the log average industry wages, the log unemployment rate and quadratic time trend (Columns 1-4) or year fixed effects (Columns 5-8). Various lags of all independent variables are included. Data are for companies in the top 300 sample with trimmed profits per employee (top/bottom 1%). Standard errors clustered at firm level. *** p<0.001, ** p<001, * p<0.05.

Table 4: The Evolution of Firm-Level Rent Sharing

	Dependent Variable: Log w_{ijt}									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1983-2000	2001-2016	1983-1991	1991-2000	2000-2009	2009-2016	1983-1991	1991-2000	2000-2009	2009-2016
Log w_{ijt}	0.376***	0.428***	0.620***	0.438***	0.512***	0.253***	0.351*	0.359***	0.597***	0.265***
	(0.086)	(0.062)	(0.161)	(0.077)	(0.057)	(0.083)	(0.183)	(0.129)	(0.085)	(0.098)
π/n_{ijt}	0.017***	0.01***	0.002	0.017***	0.010***	0.004	0.013	0.033***	0.008*	0.005
	(0.004)	(0.003)	(0.006)	(0.003)	(0.003)	(0.003)	(0.021)	(0.009)	(0.005)	(0.006)
π/n_{ijt-1}	0	-0.003	0.014	-0.003	-0.005	0.002	0.014	0.006	-0.006	0.007**
	(0.004)	(0.003)	(0.010)	(0.003)	(0.004)	(0.002)	(0.025)	(0.011)	(0.008)	(0.003)
π/n_{ijt-2}	0.004	0.002	0.003	0.006*	0.002	-0.001	0.014	-0.001	-0.003	-0.008*
	(0.003)	(0.002)	(0.008)	(0.003)	(0.002)	(0.001)	(0.025)	(0.009)	(0.005)	(0.005)
π/n_{ijt-3}	0.006*	-0.002*	-	-	-	-	-	-	-	-
	(0.003)	(0.001)								
Log $\bar{w}_{ijt}$	-0.007	0.012	-0.136	-0.010	0.121*	0.006	-0.066	-0.021	0.039	0.018
	(0.026)	(0.021)	(0.106)	(0.028)	(0.066)	(0.018)	(0.057)	(0.026)	(0.070)	(0.017)
Log $\bar{w}_{ijt-1}$	0.077	0.002	0.184	0.152	0.118	0.001	-0.004	0.019	-0.039	-0.020
	(0.116)	(0.038)	(0.227)	(0.136)	(0.119)	(0.033)	(0.060)	(0.028)	(0.066)	(0.026)
Log $\bar{w}_{ijt-2}$	-0.116	0.18*	0.000	-0.199	-0.140	0.198	-0.021	-0.030	-0.142	0.159*
	(0.116)	(0.101)	(0.210)	(0.127)	(0.140)	(0.126)	(0.037)	(0.029)	(0.086)	(0.090)
Log $\bar{w}_{ijt-3}$	-0.04	-0.016	-	-	-	-	-	-	-	-
	(0.099)	(0.09)								
LR Coeff.	**0.043**	**0.012**	**0.050**	**0.035**	**0.016**	**0.007**	**0.065**	**0.060**	**-0.003**	**0.006**
	(0.013)	(0.004)	(0.042)	(0.009)	(0.007)	(0.004)	(0.053)	(0.021)	(0.028)	(0.012)
Lester R.	**0.445**	**0.200**	**0.486**	**0.373**	**0.277**	**0.104**	**0.627**	**0.642**	**-0.056**	**0.095**
Firm-Years	4719	5032	1,901	3,748	3,437	2,474	1,897	3,748	3,437	2,474
Firms	547	503	404	539	494	379	404	539	494	379
Time	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Ind. Profits	Ind. Profits	Ind. Profits	Ind. Profits

Notes: The Arellano-Bond estimates from the first-differenced firm-level regression of log compensation per employee, on the lagged depended variable, profits per employee, the log average industry wages, and year fixed effects. Three (Columns 1-2) or two (Columns 3-10) lags of all independent variables are included. Data are for companies in the top 300 sample with trimmed profits per employee (top/bottom 1%). In columns 1-6, profits are instrumented with their previous lags. In columns 7-10, profits are instrumented with the industry-level leave-out means. Standard errors clustered at firm level. *** p<0.001, ** p<001, * p<0.05.

Table 5: Manufacturing Firm-Level Rent Sharing (Domestic Operation)

	Dependent Variable: Log w_{irt}					
	(1)	(2)	(3)	(4)	(5)	(6)
	1983-2016	1983-2016	1983-1991	1991-2000	2000-2009	2009-2016
Log w_{irt-1}	0.372***	0.370***	0.466***	0.365***	0.174***	0.239***
	(0.027)	(0.037)	(0.04)	(0.034)	(0.062)	(0.042)
π/n_{irt}	0.0150***	0.0135***	0.058**	0.042***	0.014*	0.016
	(0.012)	(0.007)	(0.026)	(0.014)	(0.007)	(0.011)
π/n_{irt-1}	0.0022	0.00251	-0.013	-0.001	0.009	-0.002
	(0.01)	(0.006)	(0.022)	(0.012)	(0.007)	(0.008)
π/n_{irt-2}	- 0.00942***	- 0.00982***	-0.014**	-0.021***	-0.008	-0.004
	(0.004)	(0.004)	(0.006)	(0.006)	(0.005)	(0.006)
π/n_{irt-3}	0.00177	0.00159	0.006	0.003	0.012**	-0.005
	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)	(0.005)
Log $\overline{w}_{irt}$	0.446***	0.0301	-1.209**	0.411	0.258	-1.286**
	(0.167)	(0.287)	(0.598)	(0.275)	(0.472)	(0.595)
Log $\overline{w}_{irt-1}$	0.412***	0.711**	-0.865	1.257**	-0.048	1.347
	(0.389)	(0.578)	(1.43)	(0.522)	(0.846)	(0.886)
Log $\overline{w}_{irt-2}$	-0.185*	0.541*	4.073*	0.753	1.178	0.11
	(0.361)	(0.71)	(2.103)	(0.48)	(0.95)	(0.939)
Log $\overline{w}_{irt-3}$	0.155	-0.333	0.131	0.322	0.335	-1.026
	(0.393)	(0.639)	(2.074)	(0.477)	(0.545)	(1.073)
Log U_{irt}	-0.110***	-0.0631*	-0.236***	0.134	0.019	-0.169
	(0.041)	(0.066)	(0.087)	(0.103)	(0.079)	(0.127)
Log U_{irt-1}	0.0973***	-0.192**	-0.522**	-0.274	0.121	-0.107
	(0.127)	(0.113)	(0.251)	(0.197)	(0.178)	(0.183)
Log U_{irt-2}	0.0222	0.0361	0.337	-0.273	-0.207	0.476**
	(0.153)	(0.148)	(0.307)	(0.23)	(0.194)	(0.238)
Log U_{irt-3}	0.0525***	0.0419	-0.115	0.182	0.155	-0.077
	(0.157)	(0.121)	(0.302)	(0.192)	(0.187)	(0.156)
LR Coefficient	**0.015**	**0.012**	**0.069**	**0.037**	**0.033**	**0.007**
	(0.008)	(0.008)	(0.054)	(0.03)	(0.015)	(0.02)
Lester Range	**0.18**	**0.15**	**0.542**	**0.329**	**0.406**	**0.076**
Firm-Years	27250	27250	13,374	9,164	3,700	3,108
Firms	2797	2797	2,058	1,606	841	619
Time	Quad	Year FE	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)

Notes: The Arellano-Bond estimates from the first-differenced firm-level regression of log compensation per employee, on the lagged depended variable, profits per employee, log average regional wages, log regional unemployment rate and quadratic polynomial of time (Column 1) or year fixed effects (Columns 2-6). Three lags of all independent variables are included. Data are for manufacturing companies from ARD and ABS, with trimmed profits per employee (top/bottom 1%). Standard errors clustered at firm level. *** p<0.001, ** p<001, * p<0.05.

Table 6: Industry-Level Rent Sharing in the EU

	Dependent Variable: Log w_{ijt} - Log w_{ijt-l}			
	(1)	(2)	(3)	(4)
	1991-2005			
$(\pi/n)_{ij2005}$ - $(\pi/n)_{ij1991}$	0.0019***	0.0015***	0.0017***	0.0012***
	(0.0001)	(0.0001)	(0.0003)	(0.0003)
Lester Range	0.05	0.04	0.05	0.03
	2005-2015			
$(\pi/n)_{ij2015}$ - $(\pi/n)_{ij2005}$	-0.0003	-0.0003	-0.0001	-0.0001
	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Lester Range	0	0	0	0
Observations	255	255	255	255
Country FE	No	Yes	No	Yes
Industry FE	No	No	Yes	Yes

Notes: The pooled OLS estimates from the industry-level regression of the 14-years (1991-2005) or 10-years (2005-2015) change in log compensation per employee on the analogous change in log value added per employee, country fixed effects (Columns 2 and 5) and industry fixed effects (Columns 3 and 4), run separately for each period. The changes are calculated for the 3-years averages. Source: EU-KLEMS, own calculations. *** p<0.001, ** p<001, * p<0.05.

Table 7: Industry-Level Rent Sharing in US Manufacturing

	Dependent Variable: Log w_{ijt}					
	(1)	(2)	(3)	(4)	(5)	(6)
	1963-2011	1963-1974	1974-1983	1983-1991	1991-2000	2000-2011
Log w_{ijt-1}	0.729***	0.362***	0.606***	0.382***	0.506***	0.508***
	(0.016)	(0.044)	(0.029)	(0.049)	(0.028)	(0.031)
$\pi/n\ _{ijt}$	0.005**	0.037***	0.010***	0.012***	0.008***	0.005***
	(0.002)	(0.009)	(0.004)	(0.003)	(0.003)	(0.002)
$\pi/n\ _{ijt-1}$	0.000	-0.001	-0.004	-0.010***	-0.005	0.001
	(0.002)	(0.009)	(0.004)	(0.004)	(0.004)	(0.002)
$\pi/n\ _{ijt-2}$	-0.003	-0.010**	-0.001	0.004	-0.002	-0.005*
	(0.001)	(0.005)	(0.003)	(0.002)	(0.003)	(0.003)
$\pi/n\ _{ijt-3}$	0.001	0.009**	-0.001	0.003	0.001	0.001
	(0.001)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)
Log $\overline{w}\ _{ijt}$	0.034***	0.065***	0.047*	0.066***	0.051***	0.008
	(0.008)	(0.020)	(0.026)	(0.022)	(0.016)	(0.014)
Log $\overline{w}\ _{ijt-1}$	0.025*	0.101**	-0.004	0.039	0.030	0.006
	(0.012)	(0.051)	(0.030)	(0.030)	(0.023)	(0.018)
Log $\overline{w}\ _{ijt-2}$	0.029*	0.082*	0.065	0.098***	0.026	-0.033*
	(0.014)	(0.050)	(0.040)	(0.029)	(0.030)	(0.018)
Log $\overline{w}\ _{ijt-3}$	0.064***	-0.027**	0.140***	0.100***	0.077***	0.042**
	(0.009)	(0.011)	(0.033)	(0.036)	(0.026)	(0.018)
LR Coefficient	**0.014**	**0.054**	**0.013**	**0.014**	**0.004**	**0.005**
	(0.005)	(0.019)	(0.012)	(0.004)	(0.008)	(0.004)
Lester Range	**0.082**	**0.174**	**0.045**	**0.064**	**0.019**	**0.032**
Industry-Years	21004	4590	4590	4130	4550	4972
Industries	459	459	459	459	458	452
Time	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)

Notes: The Arellano-Bond estimates from the first-differenced industry-level regression of log compensation per employee, on the lagged depended variable, profits per employee, the log average industry wages and year fixed effects. Three lags of all independent variables are included. Data are from IPUMS-CPS March files and NBER-CES Manufacturing database. Standard errors clustered at industry level. *** p<0.001, ** p<001, * p<0.05.

Appendix

DATA SOURCES

Annual Business Survey (ABS): Office for National Statistics. (2018). Annual Business Survey, 2008-2016: Secure Access. [data collection]. 9th Edition. UK Data Service. SN: 7451, http://doi.org/10.5255/UKDA-SN-7451-9

Annual Respondents Database (ARD): Office for National Statistics, , 1973-2008: Secure Data Service Access [computer file]. Colchester, Essex: UK Data Archive [distributor], March 2011. SN: 6644.

Compustat: Standard & Poor, 1980-2018. Access on-line through Warton Research Data Services https://wrds-web.wharton.upenn.edu/wrds/

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Table A1: The Evolution of Firm-Level Rent Sharing for Firms with Employment > 50.

	Dependent Variable: Log w_{ijt}					
	(1)	(2)	(3)	(4)	(5)	(6)
	1983-2000	2001-2016	1983-1991	1991-2000	2000-2009	2009-2016
Log w_{ijt-1}	0.389***	0.434***	0.622***	0.410***	0.486***	0.269***
	(0.084)	(0.072)	(0.160)	(0.080)	(0.060)	(0.084)
π/n_{ijt}	0.018***	0.010***	0.002	0.017***	0.009**	0.007**
	(0.005)	(0.003)	(0.005)	(0.004)	(0.004)	(0.003)
π/n_{ijt-1}	-0.004	-0.001	0.013	-0.007**	-0.001	-0.000
	(0.004)	(0.002)	(0.009)	(0.004)	(0.003)	(0.002)
π/n_{ijt-2}	0.005	0.001	0.002	0.006*	0.001	-0.002
	(0.003)	(0.002)	(0.007)	(0.003)	(0.002)	(0.001)
π/n_{ijt-3}	0.004	-0.003**				
	(0.003)	(0.001)				
Log $\overline{w}_{ijt}$	-0.007	0.005	-0.138	-0.005	0.156**	0.003
	(0.025)	(0.021)	(0.105)	(0.028)	(0.063)	(0.018)
Log $\overline{w}_{ijt-1}$	0.088	0.015	0.184	0.128	0.074	0.005
	(0.118)	(0.039)	(0.227)	(0.138)	(0.118)	(0.034)
Log $\overline{w}_{ijt-2}$	-0.174	0.142	0.000	-0.234*	-0.071	0.141
	(0.119)	(0.094)	(0.209)	(0.138)	(0.118)	(0.113)
Log $\overline{w}_{ijt-3}$	-0.023	0.043				
	(0.097)	(0.083)				
LR Coefficient	**0.038**	**0.011**	**0.044**	**0.026**	**0.017**	**0.006**
	(0.012)	(0.004)	(0.039)	(0.009)	(0.006)	(0.004)
Lester Range	**0.360**	**0.167**	**0.406**	**0.250**	**0.267**	**0.089**
Firm-Years	4,703	4,994	1,896	3,725	3,405	2,449
Firms	542	497	403	532	486	375
Time	Year FE	Year FE	Year FE	Year FE	Year FE	Year FE
Instruments	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)	Lag(2/.)

Notes: The Arellano-Bond estimates from the first-differenced firm-level regression of log compensation per employee, on the lagged depended variable, profits per employee, the log average industry wages, and year fixed effects. Three (Columns 1-2) or two (Columns 3-5) lags of all independent variables are included. Data are for companies in the top 300 sample, which average employment is larger than 50, with trimmed profits per employee (top/bottom 1%). Profits are instrumented with their previous lags. Standard errors clustered at firm level. *** p<0.001, ** p<001, * p<0.05.