Privatization and the Decline of Labour's Share: International Evidence from Network Industries

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Abstract

Some authors have suggested that the deregulation of product and labour markets is responsible for the decline in labour's share of GDP. A simple model predicts that privatization is associated with a lower labour share, due to job shedding. We test this hypothesis by focusing on privatization of network industries in the OECD. We find that, on average, privatization accounts for a fifth of the fall of labour's share and over half in Britain and France. The effect is due to lower employment, but it is partially offset by higher wages and falling barriers to entry, which dampen profit margins.

JEL classification: E25, E22, E24, L32, L33, J30

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INTRODUCTION

Capitalists are grabbing a rising share of national income at the expense of workers[1].

This quotation comes not from a socialist tract, but from the *Economist* magazine. Although the stability of labour's share (the flip side of the profit share) has often been labelled a "stylized fact of growth"[2], it has actually shown considerable variation over time with increases observed in the 1960s and 1970s and declines in many OECD countries since 1980. In Figure 1 we can see this very clearly across OECD countries between 1960 and 2005[3]. This decline has been noted not only by the *Economist* but also by economists who have sought an explanation. The most popular explanations are changes in the regulation of product and labour markets and globalization (the explanation favoured by the *Economist*) - see, for example, Blanchard (1997) and Blanchard and Giavazzi (2003). However, despite the interest in the causes of the fall of labour's share, the empirical work in the area is rather meagre. Most authors work with aggregate data (an exception being Bentolila and Saint-Paul (2003)[4]) using country-level panel regressions (e.g. Harrison, 2002; Guscina, 2006; IMF, 2007). The problem with macro data is that disentangling the impact of regulation and globalization from the many other events occurring simultaneously at the macro-level is a formidable task - we document later the difficulties in doing this. Our strategy in this paper is to use data at the country-year-industry level, specifically the network industries (i.e. Telecommunications, Postal services, Gas, Electricity, Airlines, Railways and Roads) exploiting the fact that regulatory change typically affects some industries more than others and that we can control for time and industry-country fixed effects. We find that better data helps a lot.

Another contribution of our paper is to argue that the existing framework for thinking about the causes of the decline in the labour share are not the whole story. Shifts in the labour share have been explained in a number of ways. First, since factors of production are compensated according to its marginal productivity, shifts in labour share is explained as a result of changes in factor productivity or a consequence of increasing capital-intensity of production (see Harrison (2002), Acemoglu (2003), and Bentolila and Saint-Paul (2003).) Second, declines in labour share are often attributed to the weakening of the organizational strength of unions and the decline of employment-protection policies (see Blanchard and

Giavazzi, 2003, Bassanini and Duval, 2006 and Annett, 2006). Third, and most commonly, the decline in labour's share over the past 25 years has been accredited to globalisation (see Harrison, 2002, Lee and Jayadev, 2005, Guscina, 2006, Daudey and Garcia-Peñalosa, 2007, Jayadev, 2007, and IMF report, 2007)[5]. We argue that privatization has the effect of leading to a decline in labour's share because it shifts the incentives of senior managers towards maximizing shareholder value and away from other objectives (such as job protection or "empire building" as suggested by Shleifer and Vishny (1994) among others).

Since we focus on the network industries, which are not traded, the decline in the labour share within these industries cannot readily be explained by globalization. Trade can affect equilibrium wages across the whole economy, of course, but this is the reason it is very difficult to identify the effects of trade from other country-wide influences. The deregulation of product markets leading to an intensification of competition between firms will, as we show theoretically and empirically below, tend to *increase* labour's share (e.g. Kalecki, 1938). And labour market deregulation leading to a reduction in the share of rents extracted by workers has the problem of explaining why labour's share is now so low (as can be seen from Figure 1). Even if some of the fall from 1980 is an unwinding of factors that changed in the 1960s and 1970s (such as the growth of union militancy in Europe[6]) this is unlikely to be the whole story as labour's share today is below what it was even in 1960. We show that the process of privatization has, in practice, been very important in the industries we study but its role has not been the focus of previous attention.

To summarize our results, we find that privatization leads to a lower labour share primarily because employment falls a great deal. Perhaps surprisingly privatization leads to rises in wages. Barriers to entry also appear to matter in that higher barriers to entry are generally associated with a lower labour share. In our analysis we do not find support for the hypothesis that declining worker bargaining power leads to a fall in labour's share. The finding that privatization tends to reduce labour's share helps to answer the question of why labour's share fell *despite* falling entry barriers over time (see Torrini, 2005 or Blanchard and Giavazzi, 2003). The impact of privatization does exert a strong downward pressure on labour's share and this is only partially offset by the increase in product market competition. In the network industries we find that although the fall in public ownership accounts for only about a fifth of the fall in labour's share on average in our sample, it can account for more

than half of the fall in some countries.

Although we find strong support for privatisation as an explanation for the declining labour share, we cannot explain all of the fall in the labour share. Indeed, we observe the fall in manufacturing's share of value added can account for a great deal of the fall in the labour share, which may be related to trade but may also be driven by technology and tastes. In addition, the role of globalization, even in the non-traded sectors could play an important role. For example, with increased trade openness the Heckscher-Ohlin model would predict that capital-rich countries would specialize in the production of capital-intensive goods. There could be a fall in the returns to labour in the aggregate labour market which would lead to falls in the labour share. Although the effects *within* industries are ambiguous as the fall of the wage increases demand for labour within sectors, it may be that the more capital-intensive sub-sectors within a network industry may expand leading to a decrease in labour's share. We look at this possibility in the robustness sections.

The structure of the paper is as follows: Section 2 sketches a simple model, where the manager of an organization cares not only about profits, but also about the number of employees under him in an environment of monopolistic competition and wage bargaining. We develop the predictions of the model for the effect of union power, barriers to entry and public ownership on wages, employment and the labour share. Many of these results are familiar (e.g. an increase in product market competition would be associated with a rise in labour's share as profit margins are squeezed) but one novel prediction is that a decline in public ownership may lead to a rise in wages, even though managers become more concerned about profits. Section 3 details the econometric approach we use to test the predictions of the model. Section 4 describes our data and demonstrates the difficulties of finding results that are consistent with theory when using only aggregate data. Section 5 then discusses our results based on more disaggregated data. We offer some concluding remarks in Section 6.

I. THEORY

Basic Model

This section discusses the predictions of a simple model to understand how deregulation can affect labour's share, wages and employment. The detailed analysis is in Appendix A,

but we sketch the model here. The least familiar part of the model is our assumption that the objective function of the firm is not necessarily just profits but that employment may also enter.

We parameterize this in a reduced form way in the spirit of Baumol (1959) and assume that the firm acts as if it is maximizing a weighted function of profits and employment $U(\Pi, N)$, where $\frac{\partial U}{\partial \Pi} \geq 0, \frac{\partial U}{\partial N} \geq 0$ and $U(.)$ is a concave function. One possible rationale for this is that decisions are made by managers who, because of principal-agent problems, may be free to pursue their own objectives or may be influenced by the objectives of agents other than shareholders. For example, politicians may influence firms to avoid falls in employment in state firms (this is essentially the framework proposed by Shleifer and Vishny (1994) who argue that politicians will try to persuade managers to pursue political objectives and, in particular, to maintain excess levels of labour to avoid the negative publicity associated with job losses). In our application we consider a particularly stark example of this when there is a substantial degree of public ownership. In this case, not only is governance weak, but politicians are generally reluctant to see job losses and will generally put greater weight on employment than would a private sector firm. Bertrand et al (2005), for example, present evidence that politically connected French firms behave in exactly this manner to keep firm employment high, especially during election years. The main comparative static that we are interested in is what changes when privatization, improved corporate governance or some other change in the environment forces the firm to place a greater weight on profits.

The firm is assumed to be operating in an imperfectly competitive product market and to bargain (à la Nash) with workers over wages. It is assumed, however, that employment remains unilaterally determined by the firm. We investigate the effects of changes in product market competition, worker bargaining power and the weight given to profits in the firm's objective function on the labour share, employment and wages.

First, consider a change in the degree of product market competition modelled as a higher sensitivity of quantity to price. This reduces the mark-up of price over marginal cost and reduces bargained wages as it makes the labour demand curve more elastic. Hence, marginal cost and prices are lower and employment is higher. Furthermore, because mark-ups have fallen, the labour share rises.

Next, consider a decrease in worker bargaining power. This will reduce wages, and raises

employment but, with the functional forms we use, leaves the labour share unchanged[7].

Finally, consider the key aspect of the model, what would happen if there was a fall in the importance given to jobs in the firm's value function as we expect would occur during and after privatization? Our model predicts: (i) the labour share of value added will fall, (ii) employment will fall and (iii) the average wage will rise. The fall in the labour share and employment is quite intuitive and general, since a greater focus on profits relative to jobs in the objective function will lead to lower employment and an increase in profits as a share of output. However, wages are predicted to rise. This might be found surprising because of a belief that rents in public-sector firms are partly consumed by higher wages. But, rents can be dissipated in the form of higher employment as well as higher wages. Managers who care a lot about employment may actually be more enthusiastic in opposing wage increases then a profit-maximizer, as employment can be (and is, in our model) much more sensitive to an increase in the wage than profits. In our model, public-sector firms have lower wages because this enables them to raise employment.

One might be sceptical of the relevance of this prediction to the real world because public sector workers are widely believed to earn some wage premium. However this may be a misapprehension if the main benefit of being in the public sector is job protection through very high employment levels compared to the private sector. The empirical evidence on this point is not so clear-cut. La Porta and Lopez-de-Silanes (1999) examined privatized Mexican firms and found (relative to a control group) that employment fell but wages rose after privatization[8]. Controlling for selection, both Disney and Gosling (2003) and Postal-Vinay and Turon (2007) find that there is close to zero public sector wage rents on average in the UK[9]. More generally, Borland and Gregory (1999) review the evidence on public sector labour markets, reporting a great deal of heterogeneity in estimates of the public sector wage premium (or penalty).

The predictions of the model are summarized in Table 1. We will take these predictions to the data, focusing on the primary predictions of public ownership, but also examining product market competition. We will find support for most of the model predictions in the data. Despite the interest in worker power, we have the least to say here empirically; perhaps because we lack good empirical indicators of bargaining power. The data does not give strong support to the union bargaining story.

We should acknowledge that there other possible routes by which outcomes are affected by privatization that are not contained in our model. Many papers have examined changes in total factor productivity after in privatization and/or increases in product market competition. For example, Fabrizio et al (2007) find strong positive effects on productivity when looking at deregulation of electricity generation in the US[10]. Our model abstracts from these, but if privatization increased total factor productivity only through Hicks neutral efficiency improvements then this would not have an effect on the labour share. We also acknowledge that the model is rather static and in the empirical section, we go some way with addressing this issue by considering more dynamic models.

II. ECONOMETRIC MODELS

Our basic equation of interest is:

$$SHARE_{ijt} = \alpha_i^S PO_{ijt} + \beta_i^S BTE_{ijt} + \eta_{ij}^S + (t * v_i^S) + u_{ijt}^S \quad (1)$$

where $SHARE$ is the share of the labour in value added for industry i in country j at time t. PO is an index of the degree of public ownership and BTE is an index of barriers to entry. There are two key predictions from the theory: (i) labour's share should be increasing in the importance of public ownership ($\alpha_i^S > 0$) and (ii) high entry barriers will reduce labour's share of value added ($\beta_i^S < 0$).

We consider a number of additional controls to deal with unobserved heterogeneity. First, we include a full set of industry-country fixed effects (η_{ij}^S) which are important control variables. The fixed effects and trends are intended to capture a variety of factors such as the quality of workers (e.g. demographic mix, skill and ability). Second, we include industry-specific time trends ($t * v_i^S$) – these are generally significant. The final error term is assumed to be uncorrelated with the regressors (u_{ijt}^S) although we allow it to be heteroskedactic and serially correlated (using the Newey-West technique[11]). In our basic regressions we pool over industries, setting $\alpha_i^S = \alpha^S$ and $\beta_i^S = \beta^S$, but in our extended regressions we look separately by industry and allow BTE and PO to have industry-specific coefficients.

Our models also have predictions over the behavior of employment and wages, so we estimate analogous employment equations of the form:

$$\ln N_{ijt} = \alpha_i^N PO_{ijt} + \beta_i^N BTE_{ijt} + \eta_{ij}^N + (t * v_i^N) + u_{ijt}^N \quad (2)$$

The basic model predicts that $\alpha_i^N > 0$ and $\beta_i^N < 0$.

Finally, we consider using average wages, W, as the dependent variable:

$$\ln W_{ijt} = \alpha_i^W PO_{ijt} + \beta_i^W BTE_{ijt} + \eta_{ij}^W + (t * v_i^W) + u_{ijt}^W \quad (3)$$

Our model predicts $\alpha_i^W < 0$ as the public firm finds it easier to indulge its preference for jobs by over-employing unskilled workers, leading to a low average wage. We would expect $\beta_i^W > 0$ because workers in protected industries can capture some of the monopoly rents in the form of higher wages. We also consider adding various proxies for worker bargaining power to equations (1) to (3). As we show below these are insignificant and often perversely signed.

There are a number of concerns with the estimation of equations (1), (2) and (3). First, there may be a number of omitted variables which could in principle bias the coefficients. Labour market deregulation is a particular concern that we focus on by including additional labour market controls (such as union power). Bentolila and Saint-Paul (2003) also suggest a number of controls such as TFP and the capital-labour ratio. Our baseline specifications are parsimonious as we want to focus on reduced forms based on policy variables we regard as exogenous. However, we present a large number of robustness tests including additional variables (including a full set of country trends, for example).

A second related concern is that the policy variables PO and BTE may not be exogenous. We regard this as unlikely as the policy variables are nationally decided (or sometimes internationally, as in the case of the EU Single Market Program) rather than influenced by industry specific shocks. Nevertheless, to check this concern we report experiments using country-wide socio-political variables as instrumental variables for PO[12]. A change in the governing party from a left wing party to a right wing party in the previous year is likely to be associated with greater privatization but unlikely to be associated with any industry-specific labour shock. We also use lagged country-wide changes in attitudes towards state ownership from the World Value Survey as another factor that increases the probability of privatization but is unlikely to be influenced by a shock to the labour share of the network

industries. The instruments are not perfect, of course, as there may be other unobserved factors correlated with these socio-political variables that cause a change in the labour share.

A third concern is that the model is rather static. We consider many other dynamic specifications and timing assumptions in the results section. Our basic assumption is that agents know the policy change one year ahead and start changing to policies in response to this expectation. This is based on the evidence that there is generally extensive restructuring in the year leading up to a formal transfer of asset ownership to the private sector[13]. This seems to fit the patterns in the data well, but we also report extensive experiments with longer lead and lag structures to make sure that our results are robust to alternative dynamic forms.

III. DATA

Data Sources

We obtained our data on public ownership (PO) and barriers to entry (BTE) from the OECD's regulation database (see Data Appendix A and Nicoletti and Scarpetta, 2000, 2003a,b)[14]. Public Ownership (PO) is scaled between 0 (no public sector involvement) to 6 (complete public ownership and control). This captures a combination of government ownership, control and interference in the running of the industry. These measures are developed from an in-depth analysis of the country-specific regulation working with the relevant departments in each OECD country. For example, even when an industry has been privatized, governments will typically own some proportion of equity in the dominant firm, and other things equal, the PO measure will be higher the larger is this percentage. Barriers to Entry is also an index on the scale of 0 (lowest barriers to entry) to 6 (highest barriers to entry). As with public ownership, the OECD calculated this index based on a detailed examination of costs of entering the industry based on the administrative, legal and political obstacles.

The second dataset we draw on is the OECD's STAN database. This includes information on labour (including all employer costs) and value added, which we use to calculate $SHARE$ (the labour divided by industry value added/GDP). It also includes information on employment that we use to calculate average wages (labour divided by employment)[15]. Since there are some missing values on employment in STAN we drew on a third database, the Groningen Industry Productivity Database (downloaded from http://www.euklems.net/) to

supplement STAN. In both datasets, the number engaged in employment includes number of employees as well as self employed, owner proprietors and family workers. STAN also has information on gross output, investment and labour costs.

In combining the datasets we had to aggregate across some industries to obtain consistent series. Although we also examine some other industry disaggregations in the descriptive statistics, the main econometric analysis is confined to three sectors in the network industries across eighteen countries between 1970 and 2001 (it is an unbalanced panel – see Table A1). The network industries include Electricity and Gas, Telecommunications (including Post) and Transport (Airlines, Railways and Roads). The Data Appendix gives more information and descriptive statistics on the construction of the database. Table 2 gives some basic descriptive statistics of the key variables used in the dataset. All values are expressed in real US 1996 dollars evaluated at Purchasing Power Parities (PPPs) from the OECD.

We also use two datasets to obtain the socio-political variables that are used as instrumental variables: the World Values Survey (WVS) and the Database of Political Institutions (DPI). For the purpose of our study, the variables of most interest are: (1) Self positioning in the political scale (which ranges from 1 (left) to 10 (right)), and (2) the DPI provide details about the party compositions of the Opposition and Government coalition. We look at whether the party in power is right wing or not (See Data Appendix for more details).

A drawback of the dataset is that we do not have detailed information on human capital. We attempt to capture these in the empirical work by including fixed effects specific to an industry-country pairing, time dummies, industry specific time trends.

We start our empirical analysis by illustrating the weakness of the existing evidence of the decline in the labour share that uses aggregate data. Consider an aggregate cross-country panel OLS regression of the labour's $SHARE$ in GDP on our indices of public ownership and entry barriers. In our data, estimating this equation delivers the following encouraging regression results (standard errors in brackets):

$$SHARE = \underset{(0.001)}{0.006} * PO - \underset{(0.003)}{0.029} * BTE + \text{time dummies}$$

(Observations = 327, R^2=0.35)

Consistent with the theory, an increase in public ownership is associated with a significant increase in the share of labour . Similarly, an increase in the barriers to entry index is associated with a fall in the labour share. Both are statistically significant at the 1% level. Unfortunately, including a full set of country dummies drives both policy variables to statistical and economic insignificance:

$$SHARE = \underset{(0.164)}{-0.001} * PO - \underset{(0.206)}{0.001} * BTE + \text{time dummies} + \text{country dummies}.$$

(Observations = 327, R^2=0.93)

One response to these findings would be to include observed country-wide variables instead of the country fixed effects, but this is unlikely to be credible because of the wide range of other unobserved nation-specific factors. [16]

In addition, a second problem with the existing literature on the macro-effects of regulatory change is that policy changes tend to be focused in particular sectors so a sector specific approach is more attractive. There is a significant line of research in Industrial Organization focusing on the impact of deregulation in single sectors[17]. Although enlightening, the disadvantage of this very micro approach is that it is hard to generalize to other sectors or across the economy as a whole.

In this paper, we take an intermediate approach using panel data from sectors across several OECD countries. These are the "network industries" that have seen the greatest degree of regulatory reform. The timing and extent of these reforms vary significantly between countries. We exploit these differences, as quantified by the OECD in their Regulations Database on public ownership and barriers to entry, to explicitly test some key economic mechanisms[18].

General Trends in the Data

In order to understand the declining labour share we need to highlight where the changes are taking place. We focus on the "business sector" (i.e. excluding health, education and public administration). This is where most of the change took place in the 1980s and 1990s

and is not solely in the government's control. Table 3 describes the change in labour's share between 1980 and 2000 for each country (and Figure 2 plots this graphically). [19]. Column (1) of Table 3 shows the stylized fact that has been noted elsewhere: the share of value added going to workers has fallen in every country we consider, on average by over five percentage points (compared to the 1980 average labour share of 65 per cent). For some countries, the magnitude of this decline changes depending on whether we look at the economy as a whole (as in Figure 1) or the business sector (as in Figure 2). In particular, in the US the decline for the economy as a whole is around 3% points, while for the business sector the fall is much larger at 8.8%. Our view is that focusing on the business sector labour share is appropriate since the non-business sector includes schools, health and public administration that are very labour intensive. Since these sectors have absorbed an increasing fraction of GDP, including it in the total causes the labour share to rise mechanically.

We can always decompose the total change in share for each of the (groups of) industries into the "within industry" and "between industry" changes. To be precise, for any country j we denote the labour share as $SHARE_i$ for industry i. For this exercise we divided the business sector into four broad industries – Network Industries, Manufacturing, Financial and Wholesale/Retail/Hotels. In the main empirical work we focus on sub-sectors within the network industries (where there has been the most significant time series variation in public ownership and entry barriers). The total change in the aggregate labour share ($\Delta SHARE$) can be decomposed into two components, one due to reallocation of production *between* industries with different levels of the labour share ($\sum_i \overline{SHARE}_i \Delta VA_i$) and the other due to changes in the level of share *within* industries ($\sum_i \overline{VA_i} \Delta SHARE_i$):

$$\Delta SHARE = \sum_i \overline{SHARE}_i \Delta VA_i + \sum_i \overline{VA_i} \Delta SHARE_i \tag{4}$$

where VA_i denotes the value added of industry i as a fraction of the total value added in the business sector and $\overline{SHARE}_i$ and $\overline{VA_i}$ represent a simple average of the labour share and value added for industry i over time, respectively.

In the Appendix, Table A2 gives the complete between and within changes for each industry included in the business sector. In columns (4) and (5) of Table 3 we report the results for the two most important contributions: the between changes in manufacturing and

the within changes in the network industries (the final column reports the sum of all the other components). It can be seen that the fall in manufacturing's share of value added can account for a great deal of the fall in the labour share. Figure 3 shows this more clearly. This is interesting in itself as it suggests that the decline of manufacturing is an important factor in the falling labour share. For example, part of the greater fall in the American labour share compared to the German labour share is due to the faster rate of de-industrialization in the US relative to Germany.

Nevertheless, both Table 3 and Figure 3 show that a substantial component of the aggregate fall in the labour share is attributable to changes occurring *within* the network industries. On average, changes in the network industries account for a quarter of the aggregate change in the labour share (even though they contribute, on average, only seventeen percent of aggregate value added).

The impact of the network industries is further highlighted in Figures A1, A2 and A3 in the Appendix. Figure A1 plots the time series variation of the labour share in the network industries. Compared with Figures 1 and 2 where we examined the economy as a whole, the fall of the labour share in the network industries has been larger, on average (both figures are on the same scale). Figure A2 plots the change in the (mean) public ownership index and Figure A3 plots the mean barriers to entry variables in these industries. The OECD Regulation Database reports variation across countries at the macro-level, but only reports regulatory variation over time for the network industries. Overall, there has been a trend towards privatization and a reduction in entry barriers across all countries. Figures A1 through A3 show that there is substantial heterogeneity between countries and industries in the change in the labour share and the pace of reform. It is for this reason we focus on these sectors in the paper.

IV. RESULTS

Main Results

Table 4 contains our main results from pooling the sectors across industries and countries. We divide the results into three panels. Our main results are for the labour share (Panel A) and we also consider employment in Panel B and wages in Panel C[20].

The first two columns of each panel include only public ownership (and the controls), the third and fourth columns include only barriers to entry together and the final two columns include both public ownership and barriers to entry. For each dependent variable, we first present the results without fixed effects then the results with a full set of fixed effects (industry dummies interacted with country dummies) in the next column. All specifications include a full set of time, country and industry dummies and separate time trends for each industry (in the within group specifications, the country and industry dummies are, of course, absorbed by the fixed effects).

Turning first to the labour share regressions in Panel A, we find that the two key predictions of the basic model appear to be strongly supported by the data. Public Ownership (PO) has a positive and significant effect on labour's share of value added. This relationship is strong with and without the fixed effects (e.g., the coefficient is 0.997 in column (1) and 0.850 in column (2)). The magnitude suggests that the results (with fixed effects) are economically, as well as statistically, significant. Moving from the highest to the lowest degree of public ownership (i.e. from 6 to 0) is predicted to reduce the labour share by seven percentage points (note that the entire average time series change in labour's share between 1980 and 2000 was 5.3%). The barrier to entry (BTE) variable appears to have a negative impact on the labour share as theory predicts, however it is only significant at the 10% level in column (4). In the final two columns we control for both of the policy variables simultaneously. This increases the absolute magnitude of the coefficients on the policy variables because falls in public ownership and entry barriers tend to covary positively (both are pursued at the same time by liberalizing governments). In our most general regression, the preferred specification of the final column, both policy variables are correctly signed and significant at the five percent level.

Panel B of Table 4 shows the employment regressions. The coefficient on PO in the first column is very negative, but the absence of fixed effects is very problematic here as, unlike labour's share or average wage, there is no scaling. When we include fixed effects in column (2) the coefficient on public ownership becomes positive and highly significant as we would predict from our model. Privatization is predicted to reduce employment, as is consistent with other evidence (e.g. Green and Haskel (2004)). In columns (3) and (4) we observe that BTE is positive but insignificantly associated with a fall in employment, which is not what

our model predicts (it should be negative). Turning to the preferred specification of the final column we see, as in Panel A, that public ownership is associated with significantly higher employment, but the barriers to entry variable remains insignificant. A one point decrease in PO is predicted to reduce employment by 3%.

The final panel of Table 4 (Panel C) looks at average wages. Wages appear to be significantly lower in industries that are subject to more public ownership, whether or not we control for fixed effects (compare columns (1) and (2)). In columns (3) and (4) we find that increases in entry barriers are associated with higher wages (as our model predicts), however the effect is not significant. In the final column we still find that privatization and entry regulation are associated with higher wages, but only the public ownership effect is significant at conventional levels. A one point fall in PO is associated with a two percent fall in average wages.

The employment and wage results are consistent with the findings of La Porta and Lopez de Silanes (1999) who look at the Mexican privatization program in the 1980s and find that employers reduce jobs and increase the wages of the retained workers. Donahue (1989) also observes that by comparing European (state-owned) airlines with US airlines, that public firms employ too many people, leading to higher costs.

In summary, we find that privatization is associated with a significantly lower labour share, a significantly lower number of jobs and a significantly higher average wage, other things being equal. These are all in line with the theoretical predictions of our simple model summarized in Table 1. Furthermore, we find that lower barriers are associated with a significantly higher labour share, which is also consistent with the model. The BTE results on average wages and employment are less conclusive - the entry barriers variable is not significant in the wage or employment equation (although it is correctly signed in the wage equation).

Industry heterogeneity

Table 5 breaks down the results by the three network industries. As before, the main labour share results are in Panel A. The employment equations are in Panel B and the average wage results in Panel C. We only show our preferred, most general specification where all estimates include a full set of fixed effects and time dummies. It is clear that the strongest results are again for public ownership. In eight of the nine regressions the coefficients are of

the correct sign (wages in transport are the only exception). Turning to the BTE variable, we see that in the $SHARE$ regressions the BTE is correctly signed (negative) in all three regressions. As was suggested in the pooled results in Table 4, there is not a clear picture of BTE on wages and employment. For example, BTE takes its expected positive sign in the wage equation for telecoms but has an unexpected negative sign for the other industries.

The results in Table 5, when we disaggregate by industry, show a very clear pattern for the public ownership variable, which is similar to that in the pooled results of Table 4. Public ownership is associated with a higher labour share and this is driven by the positive effect of public ownership on employment (since the wage effect is negative). This strongly suggests that privatization is an important reason for the falling labour share in the network industries. Furthermore, barriers to entry also appear to matter for labour's share – higher entry barriers are generally associated with lower labour shares of value added.

Quantification

Table 6 examines how well our simple model performs in accounting for some of the trends in the labour share between 1980 and 1998 in the network industries as a whole. The first column shows the empirical fall in the labour share between these years, which were, on average, over ten percentage points - much larger than the change for the whole business sector as shown in Table 3 (5.3 percentage points). Although every country experienced some fall in labour's share of value added in the network industries, it was obviously much more rapid in some countries than in others[21].

These declines in the labour share have coincided with a fall in barriers to entry and public ownership in every country. We make a back of the envelope calculation of how much privatization can account for the change in the labour of the network industries. Using our preferred estimates of the effect of privatization (-0.0099) and the empirical fall in public ownership (on average the index fell by 1.583 points) we account for, on average, twenty percent of the fall. This is a significant, although not an overwhelming fraction of the change. Note though that there is much heterogeneity by country. While we can only account for under two percent of the change in the labour share of the US (which had very little privatization), we can account for over fifty percent of the change in France and Britain.

In the absence of any changes in public ownership, we predict that labour's share should have *risen* in every country due to the decrease in barriers to entry, which enables stronger

competition to erode firm margins. Column (5) of Table 6 shows that entry barriers fell on average by 2.2 points. Therefore, our story is essentially that falls in entry barriers were outweighed by the role of privatization in accounting for some of the fall in labour's share.

Labour Market Regulation

Although our basic model predicts no effect of worker power on the labour share this may occur in various extensions to other bargaining models. Blanchard and Giavazzi (2003) have pointed to labour market deregulation as a possible cause of the declining labour share, especially in European countries. We empirically investigated in some detail whether labour market deregulation could also play a role in understanding the falling share of labour in value added. We augmented our specifications to include various OECD measures of the regulation of labour markets such as hiring and firing costs, the labour conflict rate, replacement rates, bite of the minimum wage, the coverage and coordination of collective bargaining, etc. These variables were all statistically insignificantly different from zero (e.g. see Appendix Table A3 on employment protection laws)[22].

A disadvantage of these labour market measures compared to the public ownership and barriers to entry measures is that they do not have variation at the industry level over time (only at the country level over time). Consequently, it may be hard to identify their effect separately from the industry time trends, time dummies, and country dummies. A possible exception is union density that does have within industry variation. Consequently we include union density in Table 7 as an additional regressor in the preferred models of Table 4, with and without fixed effects. Columns (1) and (2) have the labour share regressions, columns (3) and (4) the employment equations and columns (5) and (6) the wage equations. Although we lose a few observations because of missing values on the union density variable, it is reassuring that our main results remain robust on this sub-sample. In particular, public ownership is associated with a higher labour share, higher employment level and lower wage level. The union density variable is positive but insignificant in the labour share regressions in the first two columns. The magnitudes are also small accounting for only 2% of the fall in labour's share on average (compared to 23% for privatization).

In the fixed effects models of column (4) of Table 7 find a positive and insignificant association of union power with employment. Even more surprisingly, union density variable enters with a significantly *negative* coefficient in the wage equation of the final column. This

is inconsistent with our model and almost any other bargaining model, making us suspicious of the interpretation of the union density variable. It is possible that we are picking up the higher union membership of less skilled workers (who get paid lower wages) with the union power variable in these regressions, so union density merely reflects (unobserved) compositional changes.

We conclude that there is little empirical support for the view that declining labour market institutions are the cause of the falling labour share. This, however, may be a reflection of the difficulty in finding an adequate measure of worker bargaining power in the type of data that we have available.

Robustness Tests

We also conduct a variety of other robustness tests on the results, a few of which we report in Table 8 (see also the Appendix). In each pair of columns we present the basic specification in the first column on the sub-sample of data where we observe the extra variables we use in the experiments (because there are missing values).

First, we consider using two socio-political variables as instrumental variables for public ownership. We use (i) the median person's stated political position on a ten point left-wing/right-wing scale and (ii) the political complexion of the governing party. Note that these are country and time period specific so they do not vary across industries. The instruments are individually and jointly significant in the first stage (the F-Statistic of their joint significance is 13.08). In column (2) we show that the second stage coefficient on public ownership remains positive and significant when treated as endogenous (6.634 with a standard error of 1.989). This suggests that we may be *underestimating* the importance of public ownership by treating it as exogenous (which may be because of measurement error in PO of course, biasing the OLS coefficient towards zero).[23]

Next we follow Bentolila and Saint-Paul (2003) to include determinants of labour share, such as the capital-output ratio, that allow for a departure from the Cobb-Douglas framework (i.e. the elasticity of substitution can be different from unity). Following them we also allow control for capital augmenting technical progress (TFP) and labour adjustment costs (i.e. a labour conflict rate). We have some reservations about including these as controls as some are clearly endogenous (e.g. TFP). Nevertheless we want to ensure that our main results are not biased by excluding potentially important omitted variables from the regressions[24]. Columns

(3) and (4) present our original labour share specification with and without controlling for the capital-output ratio, respectively. We can see that our estimates of PO and BTE are largely unchanged with the inclusion of the capital-output ratio (from 0.976 to 0.965 for public ownership and from -0.904 to -0.913 for barriers to entry). The capital-output ratio is negative and significant, suggesting that capital and labour in these industries are on average substitutes. In columns (5) to (8) we repeat the exercise using TFP and the labour conflict rate, respectively. Again, it is reassuring that our estimates of PO and BTE do not change much from our original specification and if anything, become stronger. According to Bentolila and Saint-Paul (2003), if TFP is strictly capital augmenting, it should have the same sign as the capital output ratio. This is not the case, suggesting that there is a more complex effect of productivity on the production function. The labour conflict rate, like our union density measure, is insignificant. Finally, in column (8), we include all three of these measures. Our estimates of PO and BTE remain robust but the capital-output ratio becomes insignificant.

We also experiment with different dynamic structures on the policy variables by including extra lags and leads of public ownership and barriers to entry (see Appendix Table A4). There does not seem to be important additional dynamics of adjustment, as the additional lags and leads[25] were statistically insignificant. In addition, we experiment with a full set of country trend interactions. In the labour share regressions the point estimates and significance of the policy variables hardly change. The marginal effect of PO on the labour share is almost unchanged (0.919 with a standard error of 0.433) and the effect of BTE is also similar (-0.646 with a standard error of 0.209).

Finally, we also examined a productivity equation to investigate whether the results on the share could be driven by increased productivity when industries moved into the private sector. Although public ownership did seem to be associated with lower productivity, the results were not robust in magnitude nor statistical significance.

V. CONCLUSIONS

In this paper we investigate the cause of the decline in the labour share by exploiting a number of policy experiments across several "network" industries in many OECD countries. We find robust empirical evidence that privatization has been an important factor in the

fall of labour's share of value added over the past two decades in the network industries. We have argued that this occurs because publicly-owned firms have more preference for employment over profits than do privatized firms. By contrast, falling barriers to entry should increase labour's share of income as competition erodes profit margins - our evidence is consistent with this prediction. Our model also predicts that employment should fall and wages should rise following privatization, which also appears to be consistent with the data. These results are robust to a number of controls, including adding a full set of fixed effects and using socio-political variable as instruments.

Quantitatively, we find that the wave of privatization in OECD countries is a significant part of the declining share of labour in the network industries – accounting for a fifth of the fall on average, but over half in Britain and France. However, the within sector change of the network industries only accounts for a quarter of the overall fall in the aggregate labour share. Consequently, privatization (which has been concentrated in the network industries) would *not seem* to be the dominant factor in explaining what is going on at the macro level. However, there are a number of reasons why the effects of privatization that we have found may also be important in other parts of the economy. In many countries parts of manufacturing were once publicly-owned but are now privatized and in the public sector as a whole, policies such as competitive outsourcing and quasi-market reforms in health and education may have limited the ability of public-sector managers to pursue their own objectives. Even in parts of the economy that have always been in the private-sector there may have been changes in corporate governance that reduce the ability of managers to deviate from profit maximization. For example, Bertrand and Mullainathan (2003) find that weak corporate governance prompted by state laws offering protection against hostile takeovers tends to increase the labour share (though more through an effect on wages than employment).

Although we have emphasized the importance of privatization, we cannot explain all of the fall in the labour share - so what are the other factors that could account for the fall in labour's share? Labour market liberalization is an obvious culprit, but we did not find compelling evidence that this was a major factor. "Globalization" may be a possibility but this may be difficult to tackle with micro-economic data. Indeed a large component of the change (see Table 3) may simply be the shift of the economy out of manufacturing, which

may be related to trade but may also be driven by technology and tastes. Finally, some of the fall is likely to be due to the "rebound" to the rise in labour's share experienced in the 1970s so it is unsurprising that we cannot fully account for all of the observed change.

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Notes

[1] "Breaking Records" *The Economist* February 12th 2005.

[2]This concept was introduced by David Ricardo in 1821. More recently, Blanchard (1997), Cabellero and Hammour (1998) and Acemoglu (2003) have examined various aspects of the share.

[3]See Glyn (2007) for a an overview of the main explanations given to explain these patterns.

[4]Bentolila and Saint-Paul (2003) perform a cross-country analysis of the labour share across a larger number of industries. They do not focus on direct measures of policy changes as we do, however, and their interest is more on the role of the capital-output ratio in accounting for changes in labour's share, rather than the causes of the secular decline in the labour share. Their data also ends in 1993 for estimation purposes whereas ours runs until the end of the 1990s. This is important as in many countries (e.g. Italy) the most dramatic changes in privatization occurred in the late 1990s.

[5]The literature linking globalisation to the decline in labour share has found that the effect is transmitted through several channels. For example, from greater offshoring, larger flows in FDI, and from the degree of capital market openness.

[6]For example, see De Serres et al (2002) or Eichengreen (2007).

[7]This result obviously depends on the assumptions of an iso-elastic demand curve and a Cobb-Douglas technology.

[8]They rationalize their wage results through increased effort from the remaining workers - we discuss this in the Appendix.

[9]It is more likely that some groups of individuals in the public sector earn a positive premium and others obtain a negative premium compared to the private sector due to greater wage compression. For example, workers in high cost areas may do worse than those in in low cost areas when regulated wages are the same across different local labor markets (see Hall, Propper and Van Reenen, 2008).

[10]Megginson and Netter (2001) survey the literature which mainly focuses on case studies of small numbers of firms or single industries. For example, Megginson, Nash and van Randenborgh (1994) compare three year average post-privatisation performance compared to the three-year pre-privatization for 60 firms in 18 countries between 1961 and 1989. In general, they found that privatization was associated with increased output, operating efficiency, profitability, capital investment and dividend payouts. Employment, by contrast did not change on average. However, they do not control for macro-economic or industry fixed effects.

[11]This is preferable to clustering when there are a large number of time series observations per cross sectional unit.

[12]For example, consider an exogenous industry-specific shock that increases the labor share in a public sector industry. This may translate into giving labor unions greater resources through strike funds (relative to state managers) that could be used to resist attempted

privatization. Consequently, we may see high labor share associated with greater public ownership due to reverse causation (a higher labor share causes a higher value of PO).

[13]For example, Martin and Parker (1995) look at British firms privatized in the 1980s. They find that privatization itself had a small positive effect on performance, but the improvements took place before formal divestiture.

[14]These were kindly supplied to us at a greater degree of disaggregation than is publicly available in the standard OECD publications by Giuseppe Nicoletti.

[15]In a few cases this can exceed unity (if the industry is making losses). We "winsorized" the variable to take a maximum value of unity in these cases, but the results are robust to using the raw data.

[16]In the unemployment and regulation literature, researchers attempt to estimate much more sophisticated models including country-specific time trends, longer lags, interactions between policies and so on. But this is likely to make the identification problem worse, not better. See Nickell (2003) for example. Baker et al (2004) give a compelling criticism of the robustness of the empirical cross country unemployment and regulation literature.

[17]For example, Rose (1987) on trucking or Olley and Pakes (1996) on telecommunications equipment.

[18]The only other paper we know of that uses regulation data in a cross country industry level panel setting is Alessini et al (2005). They find evidence that entry barriers reduce investment.

[19]Although we use STAN for most of the analysis, here we use the data from the Groningen Industry Productivity Database since it has a continuous dataset from 1980. We only report the results for the countries for which we have continuous data between 1980 and 2000. The datasets are described in more detail in the Appendix.

[20]There are slightly different numbers of observations in each panel because of missing values on the dependent variable. Table A5 in the Appendix shows that the results are

robust if we condition on a common sample for all three regressions

[21]The large fall in Italy is mainly post 1995 (the 1980-1994 fall was 16 percentage points), which coincided with a major utility privatization in 1995.

[22]This is the case with and without the inclusion of the BTE and PO variables.

[23]We extend this method to allow for BTE to also be endogenous. In this case the coefficients on both endogenous variables are still above their OLS levels. However, the first instrument is only weakly related to BTE and therefore is not as suitable as an instrument as it is for PO.

[24]Bentolila and Saint-Paul (2003) use lags of the endogenous variables as instrumental variables, but this identification strategy hinges on assumptions over the absence of higher order serial correlation.

[25]For example, the coefficient (standard error) of including the additional lead of PO in the labor share equation was 0.863(0.601)

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Table 1: Theoretical Predictions

Experiment	Notation	Empirical proxy	labour share of value added SHARE	Average wages W	Employment N
Increase in weight given to profits in firm value equation	ϕ	Public Ownership (PO down)	FALLS	RISES	FALLS
Increase in Product market competition	η	Barriers to Entry (BTE down)	RISES	FALLS	RISES
Decrease in worker bargaining power	β	Union Density (UNION down)	ZERO	FALLS	ZERO

NOTES:- See Section 2 and Appendix A for discussion and derivation of these comparative statics

Table 2: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Min	Max
Barriers to Entry (PO)	911	4.198	1.894	0	6
Aggregate Public Ownership (PO)	911	4.170	1.761	0	6
Labour Share of Value added	911	0.493	0.162	0.195	0.958
Employment	1020	330,412	536,479	11000	2,777,000
Value Added($m)	911	24,314	41,098	63	279,987
Wage Bill ($m)	911	12,277	21,968	23	163,507
Wages($)	827	35,469	21,770	11,361	390,234
Union Density	785	0.438	0.21	0.086	0.911

NOTES:- Means and standard deviations from sample (see Data Appendix for a full description). Employment data comes from Groningen Industry Productivity Database. The number of observations for real wages falls because we calculate real wages using the wage bill divided by employment and there are missing values in each. All values are expressed in real US 1996 dollars evaluated at PPPs from the OECD.

Table 3: Changes in the Labour Share, 1980-2000

Country	[1] Change in Business Sector	[2] Labour share 1980	[3] Labour Share 2000	[4] Within Network Industries Change	[5] Between Manufacturing Change	[6] All Other Components
Austria	-4.02	60.87	56.86	-0.269	-1.89	-1.856
France	-5.6	65.71	60.11	0.323	-5.645	-0.277
Germany	-1.85	69.17	67.32	-1.908	-4.33	4.389
Italy	-6.22	65.75	59.53	-4.077	-5.904	3.758
Netherlands	-7.02	62.54	55.52	-1.016	-3.528	-2.476
Spain	-4.37	54.07	49.7	-1.164	-8.418	5.21
USA	-8.83	70.17	61.34	-1.234	-6.544	-1.052
United Kingdom	-4.34	69.45	65.12	-1.572	-8.308	5.544
Average	-5.28	64.72	59.44	-1.365	-5.571	1.655

NOTES:- Data from Groningen Industry Productivity Database; coefficients are multiplied by 100 (so the element in the first row and column indicates that the labour share of value added fell by four percentage points in Austria between 1980 and 2000 from 61% to 57%). The decomposition formula used is equation (4) in the text. We present only three elements: the within component from Network Industries, the Between Component from the manufacturing sector and the residual of all other effects (see Table A1 for a complete breakdown), so the sum of the last three columns equals the first column.

Table 4: Econometric Results (Pooling over Network Industries)

Panel A – Share (Labour Share of Value Added)

	[1]	[2]	[3]	[4]	[5]	[6]
Public Ownership (PO)	0.997	0.850			1.104	0.994
	(0.383)	(0.344)			(0.391)	(0.352)
Barriers to Entry (BTE)			-0.353	-0.462	-0.512	-0.565
			(0.297)	(0.243)	(0.296)	(0.241)
Fixed Effects (54)	No	Yes	No	Yes	No	Yes
Observations	911	911	911	911	911	911

Panel B – ln(Employment)

	[1]	[2]	[3]	[4]	[5]	[6]
Public Ownership (PO)	-13.065	3.010			-13.270	2.804
	(2.452)	(0.943)			(2.719)	(0.992)
Barriers to Entry (BTE)			-2.661	1.102	0.564	0.673
			(1.381)	(0.551)	(1.527)	(0.577)
Fixed Effects (57)	No	Yes	No	Yes	No	Yes
Observations	1020	1020	1020	1020	1020	1020

Panel C – ln(Average Wage)

	[1]	[2]	[3]	[4]	[5]	[6]
Public Ownership (PO)	-4.872	-1.715			-5.229	-1.846
	(1.358)	(0.777)			(1.421)	(0.800)
Barriers to Entry (BTE)			0.460	0.188	1.336	0.433
			(0.749)	(0.467)	(0.803)	(0.487)
Fixed Effects (54)	No	Yes	No	Yes	No	Yes
Observations	827	827	827	827	827	827

NOTES:- All coefficients and standard errors are multiplied by 100; coefficients are from separate OLS regressions with Newey-West standard errors (in parentheses under coefficients) corrected for first order serial correlation. The sample is pooled across three industries (transport, electricity/gas, and telecommunications/post). "Share" is the Labour Share of Value Added. We include a full set of time dummies (24) and time trends interacted with industry dummies. The non-fixed effects specifications include up to 19 country and 3 industry dummies. Numbers of observations differ between the panels due to missing values on the dependent variable.

Table 5: Results Separately by Industry

Panel A: Share (Labour Share of Value Added)

	[1]	[2]	[3]
Sector	Electricity and Gas	Telecom and Post	Transport
Public Ownership (PO)	0.545	0.120	2.351
	(0.393)	(1.138)	(0.555)
Barriers to Entry (BTE)	-0.618	-1.238	-0.086
	(0.470)	(0.531)	(0.229)
Observations	366	255	289

Panel B: ln(Employment)

	[1]	[2]	[3]
Sector	Electricity and Gas	Telecom and Post	Transport
Public Ownership (PO)	5.585	1.569	0.923
	(1.513)	(1.181)	(1.867)
Barriers to Entry (BTE)	1.822	1.090	0.190
	(1.177)	(0.763)	(1.007)
Observations	354	313	353

Panel C: ln(Wage)

	[1]	[2]	[3]
Sector	Electricity and Gas	Telecom and Post	Transport
Public Ownership (PO)	-2.774	-4.569	1.179
	(1.053)	(2.463)	(1.175)
Barriers to Entry (BTE)	-0.012	0.680	-0.349
	(0.690)	(0.972)	(0.964)
Observations	301	244	282

NOTES:- Coefficients and standard errors are multiplied by 100; these are coefficients and standard errors (in brackets) for separate OLS regressions for each specified industry. The Newey-West standard errors (in parentheses under coefficients) are corrected for first order serial correlation. We include a full set of time dummies and fixed effects (country dummies in this case) in all regressions.

Table 6: Quantification of the Role of Privatisation in Changing Labour's Share in the Network Industries, 1980-98

Country	[1] Actual Change in Share	[2] ΔPO	[3] α_{PO} *ΔPO	[4] Proportion [3]/[1]	[5] ΔBTE	[6] α_{BTE}*ΔBTE
Austria	-0.062	-0.750	-0.008	0.121	-2.424	0.014
France	-0.018	-1.053	-0.011	0.585	-2.25	0.013
Germany (1991-98)	-0.057	-0.898	-0.009	0.158	-2.58	0.014
Italy	-0.269	-1.873	-0.019	0.070	-1.885	0.011
Netherlands	-0.143	-1.645	-0.016	0.115	-3.112	0.017
Spain	-0.085	-1.523	-0.015	0.179	-1.99	0.011
USA	-0.094	-0.173	-0.002	0.018	-1.44	0.008
United Kingdom	-0.084	-4.747	-0.047	0.565	-2.063	0.012
Unweighted Average	-0.102	-1.583	-0.016	0.226	-2.218	0.012

NOTES:- These are calculations taken over 1980-1998 using actual empirical changes in shares, BTE (Barriers to Entry index)and PO (Public Ownership). Coefficients are taken from Table 4 column 6 (-0.0056 on BTE and 0.0099 on PO). Although there are more countries included in the analysis, here we report the results for the countries for which we have a consistent set of data from 1980-1998.

Table 7: Role of Labour Market Institutions (Union Density)

	[1]	[2]	[3]	[4]	[5]	[6]
Dependent variable	Share		Ln(Employment)		Ln(Wage)	
Public Ownership (PO)	1.005	1.129	-15.991	3.220	-2.886	-1.192
	(0.464)	(0.384)	(3.189)	(1.012)	(1.631)	(0.757)
Barriers to Entry (BTE)	-0.862	-0.819	3.598	-0.127	2.228	0.193
	(0.318)	(0.255)	(1.524)	(0.570)	(0.797)	(0.457)
Union Density	2.009	1.614	-66.130	0.859	-1.617	-30.726
	(1.751)	(4.044)	(11.487)	(6.208)	(7.659)	(7.107)
Fixed Effects	No	Yes	No	Yes	No	Yes
Observations	785	785	817	817	702	702

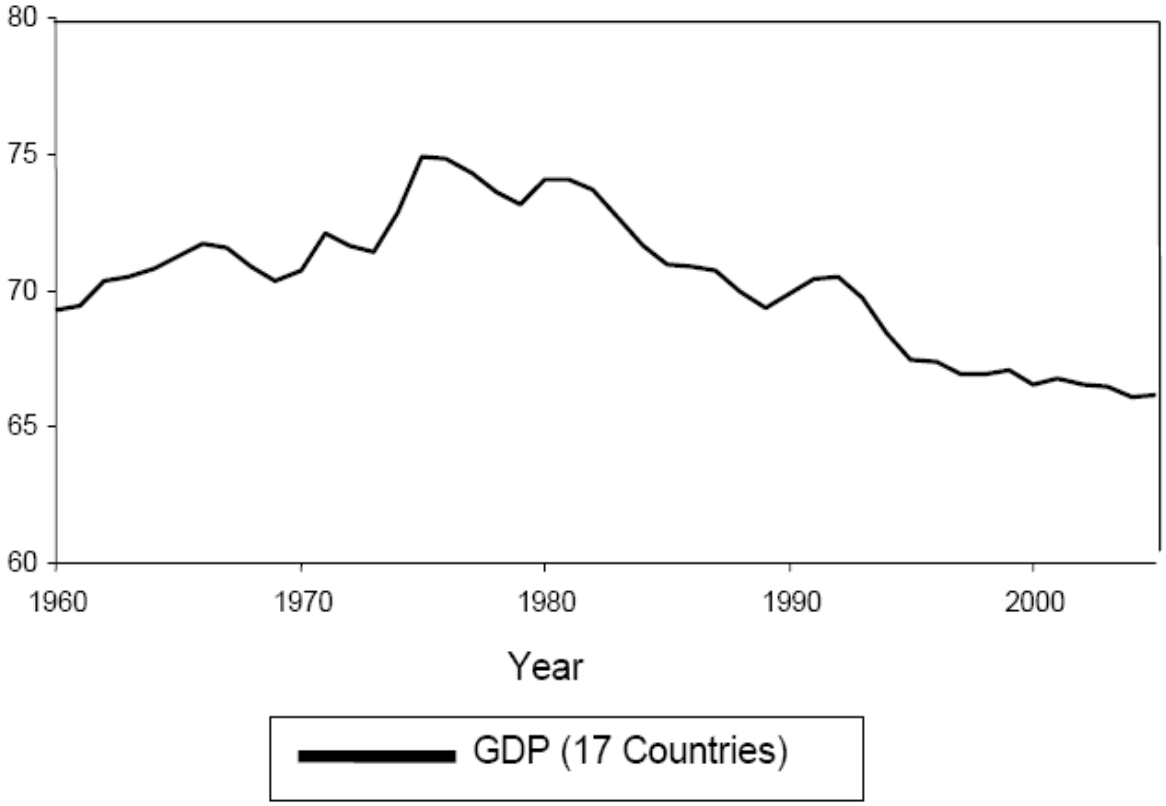
NOTES:- All coefficients and standard errors are multiplied by 100. The coefficients are from separate OLS regressions. The sample is pooled across three industries (electricity/gas, telecom/post and transport). "Share" is the Labour Share of Value Added. We include a full set of time dummies and time trends interacted with industry dummies (the base trend is Trend*Transport). The non-fixed effects specifications include a full set of country and industry dummies. The Newey-West standard errors (in parentheses under coefficients) are corrected for first order serial correlation. The Union Density measure taken from Ebbinghaus and Visser (2000)

Table 8: Robustness of Pooled Results

	[1] OLS	[2] IV	[3] OLS	[4] OLS	[5] OLS	[6] OLS	[7] OLS	[8] OLS	[9] OLS	[10] OLS
Public Ownership	1.032	6.634	0.976	0.965	1.124	1.441	0.896	0.911	0.910	1.119
	(0.362)	(1.989)	(0.370)	(0.374)	(0.359)	(0.349)	(0.371)	(0.370)	(0.394)	(0.391)
Barriers to Entry	-0.593	-1.225	-0.904	-0.913	-0.826	-0.693	-0.551	-0.560	-1.060	-0.891
	(0.249)	(0.362)	(0.208)	(0.208)	(0.187)	(0.185)	(0.297)	(0.291)	(0.262)	(0.265)
Ln(Capital-Output)				-4.396						-2.492
				(1.556)						(1.663)
Ln(TFP)						7.812				5.779
						(1.817)				(2.561)
Labour Conflict Rate								0.597		-1.918
								(1.741)		(1.676)
Fixed Effects	53	53	35	35	42	42	48	48	30	30
Observations	865	865	643	643	750	750	818	818	550	550

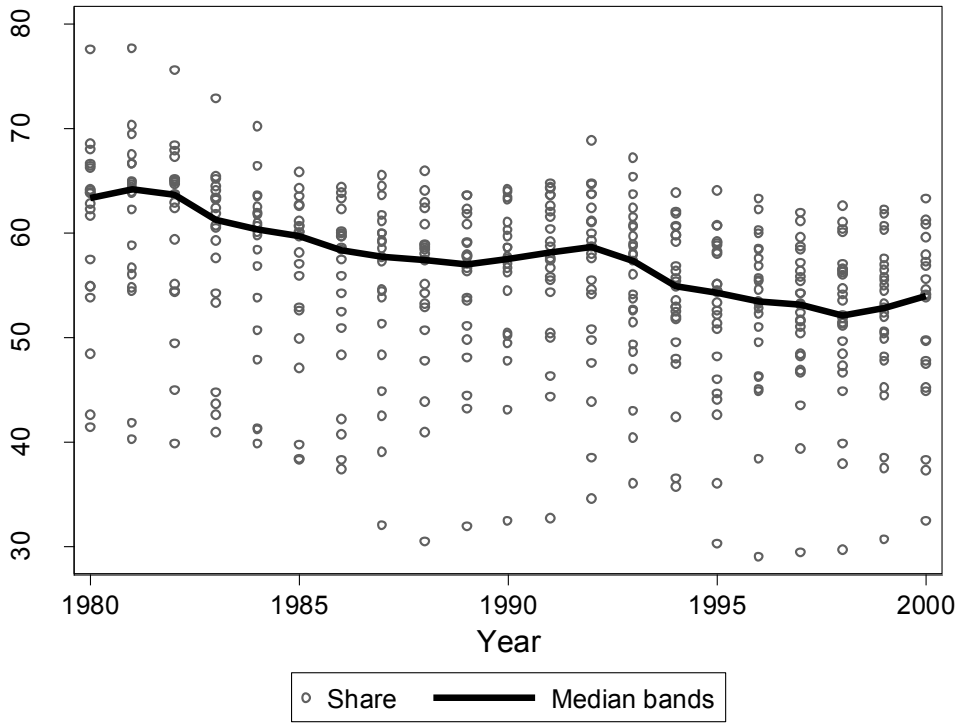
NOTES:- All coefficients and standard errors are multiplied by 100; coefficients are from separate OLS regressions with Newey-West standard errors (in parentheses under coefficients) correct for first order serial correlation. The sample is pooled across three industries (electricity/gas, telecommunications/post and transport) "Share" is the Labour Share of Value Added. We include a full set of time dummies and time trends interacted with industry dummies (the base trend is Trend*Transport). The Capital, Output and TFP variables are constructed from the OCED International Sectoral Data Base (ISDB). The Labour Conflict Rate variable is constructed from the CEP-OECD Dataset, documented in Bell and Dryden, 1996

Figure 1: Labour's Share as a Percentage of Gross Income Across 17 OECD Countries, 1960-2005



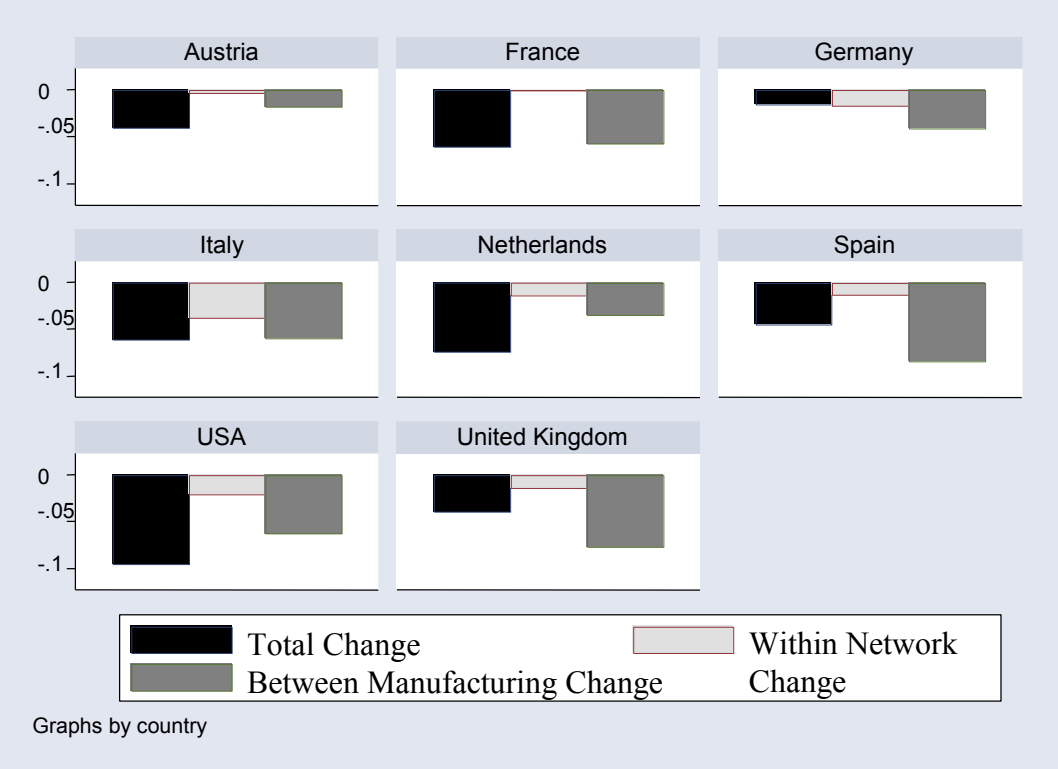
SOURCE:- This figure is taken from Glyn (2006). This in an unweighted average and is the whole economy (including the non-business sector). The countries included are: Australia, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, UK, Japan and USA.

Figure 2: Change in the Labour Share in the Business Sector across OECD Countries, 1980-2000



NOTES:- These are the share of the labour share in value added for the business sector (i.e. excluding health, education and public administration) between 1980 and 200. Countries include: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, USA, and United Kingdom

Figure 3: Decompositions of the Changes in the Aggregate Labour Share of Value Added, 1980-2000



NOTES:- This figure is derived from the results in Table 3. All aggregate changes are broken down into "within industry" and "between industry" components across four broad sectors (Network Industries, Manufacturing, Finance, and Wholesale/Retail/Hotels). The contributions of the Within Network Industry and between manufacturing components are shown as these tend to be the largest components.

APPENDIX A
IA. SIMPLE MODEL

In this Appendix we detail the model that we presented intuitively in the main text. The model adopts specific functional forms to show the main intuitions.

Set up

The firm is assumed to care about profits (Π) and total employment (N) so that the value function of the firm is $U(\Pi, N)$, where $\frac{\partial U}{\partial \Pi} \geq 0, \frac{\partial U}{\partial N} \geq 0$ and $U(.)$ is a concave function. Choosing employment to maximize the value function, given the wage (W), leads to the following expression for the value of the marginal product of labour ($VMPL$) :

$$VMPL = W - (\frac{\partial U}{\partial N} / \frac{\partial U}{\partial \Pi}) \tag{1}$$

This implies that, for a given wage, the firm will have an employment level higher than would be the case if the firm simply maximized profits. To simplify we adopt the functional form:

$$U = \Pi^{1-\phi} N^{\phi} \tag{2}$$

where $0 \leq \phi < 1$. Privatization, for example, can be thought of as a reduction in ϕ. A representative organization has profits:

$$\Pi = PQ - WN \tag{3}$$

where P is price and Q is value added and we abstract away from other factors of production. The product market is imperfectly competitive so the firm faces the inverse demand curve:

$$P = BQ^{-\frac{1}{\eta}} \tag{4}$$

where B is a demand index and $\eta \geq 1$ is the price elasticity of demand. Output is produced with the production function $(0 < \alpha \leqslant 1)$[1].

$$Q = CN^{\alpha} \tag{5}$$

Substituting (2), (3), and (4) into (1) and taking logs we obtain:

$$\log U = (1-\phi)\log[BC^{1-\frac{1}{\eta}}N^{\alpha(1-\frac{1}{\eta})} - WN] + \phi \log N \tag{6}$$

The firm chooses employment to maximize the equation (6) given the wage, leading to the labour demand equation:

$$\log N = -\frac{1}{1-\alpha(1-\frac{1}{\eta})}[\log W - \log B - \log C^{1-\frac{1}{\eta}} - \log(\alpha(1-\frac{1}{\eta})(1-\phi)+\phi)] \tag{7}$$

There are several things to note about the labour demand curve. First, the stronger the preference of the employer for jobs over profits (ϕ), the higher will be employment for a given wage. Secondly, the labour demand curve slopes downwards with an elasticity that does not depend on the wage (i.e. $\varepsilon_{NW} = -\dfrac{\partial \log N}{\partial \log W} = \dfrac{1}{1-\alpha(1-\frac{1}{\eta})} \geq 1$) and does not depend on the preferences of the employer. The easiest way to understand why the labour demand curve slopes downwards, even for the case where the employer only cares about employment ($\phi = 1$), is that employment will be chosen to make profits zero as the break-even point is binding: the higher the wage, the lower the level of employment that delivers zero profits.

We can also derive a simple expression for the labour share from this maximization. We write the value of the marginal product of labour as:

$$VMPL = \alpha P(1-\frac{1}{\eta})\frac{Q}{N} \tag{8}$$

Substituting these into the first order condition (1) gives:

$$VMPL = \alpha P(1-\frac{1}{\eta})\frac{Q}{N} = W - (\frac{\phi}{1-\phi})(\frac{PQ}{N} - W) \tag{9}$$

Re-arranging and solving for the labour's share, we obtain:

$$SHARE \equiv \frac{WN}{PQ} = \alpha(1 - \frac{1}{\eta}) + \phi(1 - \alpha(1 - \frac{1}{\eta})) \tag{10}$$

So that the labour share is independent of the wage; of course this is derived from the assumption that all functions are iso-elastic. Equation (10) shows the key relationships we will focus on in the paper. First, in the standard case of perfect competition and profit maximization (i.e. $\phi = 0$ and $\lim \eta \rightarrow \infty$), equation (10) shows that the labour share will be equal to the technological parameter, α. However, if there is some degree of non-profit maximizing behavior then as $\phi > 0$, the labour share will be higher, all else being equal. Empirically, we will focus on public ownership as affecting the departure from profit maximizing behavior. Second, the greater the degree of monopoly power (a lower η), the lower will be the labour share, all else being equal. Empirically, we will focus on higher barriers to entry, such as those caused by legal or bureaucratic rules as a source of market power.

One further result that will be useful in what follows is the elasticity of employer utility with respect to the wage (ε_{UW}). By differentiating (6) and using the envelope condition, we can show that the elasticity of utility with respect to wages is:

$$\varepsilon_{UW} = -\frac{\partial \log U}{\partial \log W} = (1 - \phi)\frac{SHARE}{1 - SHARE} = \frac{\alpha(1 - \frac{1}{\eta})(1 - \phi) + \phi}{1 - \alpha(1 - \frac{1}{\eta})} \tag{11}$$

Note that this elasticity is increasing in ϕ so that an employer who cares a lot about employment will find their utility reduced more by a given wage increase than one who does not. The simplest way to understand this is to think of the two extreme cases $\phi = [0, 1]$ in which the employer only cares about either employment or profits. An employer who is only interested in profits (i.e. has $\phi = 0$) will have an elasticity of utility with respect to the wage which is the elasticity of profits with respect to the wage. In contrast, an employer who only cares about employment (i.e. has $\phi = 1$) , will have an elasticity of utility with respect to the wage which is the elasticity of labour demand with respect to the wage which, under the assumptions made, is greater than the elasticity of profits with respect to the wage[2]. This assumes that even state employers face some kind of budget constraint generating a wage-employment trade-off[3]. The consequence of this is that an employment-maximizing

employer will be more hostile to wage rises than a profit-maximizing one.

Now consider the determination of the wage. As is standard, we consider Nash bargaining between the workers which has the form:

$$\Omega = \beta \log V + (1 - \beta) \log U \tag{12}$$

Where V is the utility of the workforce and β is the worker bargaining power parameter. We assume that the preferences of the workers can be written as:

$$\log V = \log(W - A) + \gamma \log N \tag{13}$$

where A is the value of the alternative "outside" wage and γ is the union preferences over employment compared with the wage. Differentiating Ω with respect to wages and re-arranging delivers the "wage equation":

$$W = \frac{\beta\gamma\varepsilon_{NW} + (1 - \beta)\varepsilon_{UW}}{\beta\gamma\varepsilon_{NW} + (1 - \beta)\varepsilon_{UW} - \beta} A = (1 + \mu)A \tag{14}$$

Where:

$$\mu = \frac{\beta[1 - \alpha(1 - \frac{1}{\eta})]}{\beta(1 - \gamma - \alpha(1 - \frac{1}{\eta})) + \phi[(1 - \beta)(1 - \alpha(1 - \frac{1}{\eta}))]} \tag{15}$$

μ can be thought of as a wage mark-up over the outside option. With these results we can develop our predictions about the effects of various changes on the labour share, wages, employment, and productivity.

Analysis

The main comparative static we are interested in is what changes when privatization, improved corporate governance or some other change in the environment forces the firm to place a greater weight on profits than on firm size (i.e. ϕ falls). If there is a fall in the importance given to jobs in the firm's value function then our model predicts: (i) the labour share of value added will fall, (ii) the average wage will rise, (iii) employment will fall. The fall in the labour share follows directly from equation (10) since $1 - \alpha(1 - \frac{1}{\eta}) > 0$. This is quite intuitive and general, since a greater focus on profits in the objective function, relative

to jobs, will lead to an increase in profits as a share of output. Wages will rise from equation (15) because $(1-\beta)(1-\alpha(1-\frac{1}{\eta}) > 0$ and employment falls from equation (7). The intuition is that an employer who cares a lot about employment will be much more sensitive to an increase in the wage than one who places a much greater importance on profit maximization because employment is more sensitive to wages than profits.

Next, consider a change in the degree of product market competition. In our model, an increase in product market competition leads to a higher sensitivity of quantity to price (i.e. an increase in η). This will raise the labour share (from equation (10)), and reduce wages (from equation (15)) as it makes the labour demand curve more elastic. Finally, it will increase employment from equation (7). Finally, consider a decrease in worker bargaining power (β falls). This will reduce wages, raise employment but leave the labour share unchanged[4].

These predictions are summarized in Table 1.

Some Possible Extensions to the model

This analysis is solely in partial equilibrium and there are other effects present in the general equilibrium settings, as described by Blanchard and Giavazzi (2003). They show how one can derive a positive effect of bargaining power on labour's share in a general equilibrium, efficient bargaining framework.

Another possible extension is to allow for heterogeneous labour . Assume that there are two types of labour , skilled (denoted by a subscript "S") and unskilled labour (denoted by a subscript "U"). They have different market wages but we still assume that it is total employment that the manager cares about. In this case, the relative value marginal product can still be written:

$$\frac{VMPL_S}{VWPL_U} = \frac{W_S - (\frac{\partial U}{\partial N}/\frac{\partial U}{\partial \Pi})}{W_U - (\frac{\partial U}{\partial N}/\frac{\partial U}{\partial \Pi})} \tag{16}$$

In the public sector there will be an over employment of unskilled workers relative to skilled workers (as it is cheaper to indulge the preference for larger employment size by employing more low-wage workers). If we consider the case of total privatization (a change to ϕ=0) this will lead to a reduction in the employment of unskilled workers. Consequently

privatization will lead not only to a fall in employment but also to an increase in the observed average wage as there is a compositional shift to the more skilled.

Finally, there may be effort bargaining. Andrews and Simmons (1995) argue that the big decline in jobs (but not wages) of large UK unionized workplaces in the 1980s can be explained by a model where unions bargain over both wages and effort but their influence over effort has declined. We would obtain similar results if we assumed that after privatization the nature of bargaining changed from an "efficient bargain" over both wages and employment to a "right-to-manage model" in which only wages are negotiated. In fact, Bentolila and Saint-Paul (2003) formally show that increases in worker bargaining power will usually increase labour's share in an efficient bargaining model.

AII. DATA APPENDIX

OECD Regulation Databases

The key dataset is the OECD Regulation database developed by Nicoletti and Scarpetta (2000, 2003a,b). There are overall country-wide indicators of regulation, barriers to entry (BTE) and public ownership (PO) for 21 countries between 1975 and 1998. There are also industry-specific time series for barriers to entry and public ownership for seven non-manufacturing industries, which is our focus in this paper. These were kindly supplied at a greater degree of disaggregation than is publicly available in the standard OECD publications by Giuseppe Nicoletti. All of these are on a scale of 0 to 6 (from least to most restrictive).

Public Ownership measures the share of equity owned by municipal or central governments in firms of a given sector. The two polar cases are of no public ownership ($PO = 0$) and full public ownership ($PO = 6$). Intermediate values of the public ownership indicator are calculated as an increasing function of the actual share of equity held by the government in the dominant firm. The information in the OECD's data also draws upon the OECD's *Privatization Database* and the Fraser Institute's *Economic Freedom of the World Reports.*

Barriers to Entry cover legal limitations on the number of companies in potentially competitive markets and rules on vertical integration of network industries. The barriers to entry indicator takes a value of zero when entry is "free" (defined as a situation with three or more competitors and with complete ownership separation of a natural monopoly and a competitive section of the industry) and a value of six when entry is severely restricted

(i.e. situations with legal monopoly and full vertical integration in network industries or restrictive licensing in other industries). Intermediate values represent partial liberalization of entry (e.g. legal duopoly, mere accounting separation of natural monopoly and competitive segments).

The construction of the indicators takes the following steps. First, the separate indicators are constructed at the finest level of industry disaggregation. Second, these indicators are then aggregated at the industry level using revenue averaged weights. Thirdly, for the country-wide aggregators the industry indices are aggregated using revenue weights again.

For more information on the construction, properties and descriptive statistics of this data see Nicoletti and Scarpetta (2000) or Alessini et al (2004).

Labour Market Regulations

Our labour market regulation measures are drawn from the OECD, Bell and Dryden (1996), Nickell et al (2002), Nickell (2003) and Baker et al (2004). For the union density information we drew on the work of Ebbinghaus and Visser (2000).

Industry Data: STAN, ISDB and Groningen Databases

The main data source for investment, value added, labour and employment comes from the OECD STAN database for Industrial Analysis, based on the International Standard Industrial Classification Revision 3 (SIC Rev. 3). We had to aggregate the regulation data to the most disaggregated STAN level available. These were the following five industries: Electricity and Gas; Telecommunications and Post; Transport (Airlines, Railways and Road Freight). We supplemented STAN with information on the capital stock from the OECD's International Sectoral DataBase (ISDB). We used ISDB to allocate the capital stock to STAN in the first year and then used the perpetual inventory method to build up the capital stock using gross investment flows from STAN. We used a depreciation rate of eight percent.

We also drew on the Groningen Database to supplement employment series that were sometimes missing in STAN and ISDB for particular industries in particular years. Although for most part the STAN and Groningen data on employment is compatible, there are three discrepancies for UK in the late 1990s, which we drop from our analysis. Because of non-overlapping data from STAN and Groningen we have slightly different numbers of observations for the three main regressions (SHARE, wages and employment). Table A1 gives the final balance of the panel on the non-missing observations.

Database of Political Institutions: World Bank Database

The Database of Political Institutions (DPI) contains 106 variables for 177 countries over the years 1975-2004. The variables provide details about elections, electoral rules, types of political system, party compositions of the opposition and government coalition and the extent of military influence on the government.

We look at the cross-country time series of whether the party of government is right-wing or not. To identify the party orientation with respect to economic policy, they use the criteria: (1) *Right*: for parties that are defined as conservative, Christian Democratic or right-wing, (2) *Left*: for parties that are defined as communist, socialist, social democratic or left wing, (3) *Centre*: for parties that are self-defined as centrist or when the party position can best be described as centrist , (4) All those cases which do not fit into the other mentioned categories or when there is no information.

Socio-political Attitudes: World Value Survey

The World Values Survey (WVS) is a worldwide investigation of sociocultural and political change. Interviews are carried out with nationally representative samples of the public. The World Values Survey provides a broad range of variables for analyzing the impact of the values and beliefs of the public. We used the variable that measures self positioning in the political scale - this ranges from 1 (far left) to 10 (far right).

The interviews were conducted with a representative sample of at least 1,000 adults aged over 18 from each country. To ensure that the variables that we use are nationally representative we apply the provided sampling weights. When merging this data with other data we collapse the variables at the median. We also repeated the analysis by collapsing at the mean with similar results. The survey was carried out in 1981, 1990, 1991, 1995, 1996, 1999, 2000 and 2001, but for most countries we only have data in years 1981, 1990 and 1999. We interpolated linearly over missing years. We do not have data for Greece until 1999 so it is dropped from the data.

Notes

[1]This simplified Cobb-Douglas form is for expositional purposes. Bentolila and Saint-Paul (2003) examine more general production functions, which generate some additional implications that we will discuss in the robustness section.

[2]This intuition suggests that this result is dependent on the wage elasticity of the labour demand curve being larger than the wage elasticity of the profit function. This is not true for all production functions, but is true for Cobb-Douglas, which seems a reasonable approximation to the data (see for example Hamermesh (1993), chapter 3).

[3]Although publicly owned firms may be able to sustain losses for a greater length of time than those in the private sector, there is still some level at which the Finance Ministry will refuse to fund an increase in the industries level of subsidy.

[4]This result obviously depends on the assumptions of an iso-elastic demand curve and a Cobb-Douglas technology.

APPENDIX A

Tables and Figures

Table A1: Balance of Panel by Country and Industry

Country	Electricity and Gas	Post and Telecom	Transport	Total
Australia	32	22	22	76
Austria	26	26	26	78
Belgium	16	17	17	50
Canada	30	20	20	70
Denmark	32	32	32	96
Finland	32	27	27	86
France	31	23	23	77
Germany	11	10	10	31
Greece	7	7	7	21
Italy	32	22	22	76
Japan	32	19	19	70
Netherlands	32	22	22	76
Norway	32	11	11	54
Portugal	23	16	16	55
Spain	17	15	15	47
Sweden	30	20	20	70
USA	32	32	32	96
United Kingdom	31	9	9	49
Total	478	350	350	1178

NOTES: This is the unrestricted sample without controlling for missing values in share, employment and wages.

Table A2: Change in the Labour Share, 1980-2000

	Change in Business Sector	Network Industries				Manufacturing				Wholesale, Retail & Hotels				Financial Services			
Country		$\bar{S}$	$\bar{V}$	Within	Between	$\bar{S}$	$\bar{V}$	Within	Between	$\bar{S}$	$\bar{V}$	Within	Between	$\bar{S}$	$\bar{V}$	Within	Between
Austria	-4.02	62.53	16.98	-0.27	-0.37	62.55	40.02	-5.77	-1.89	55.41	30.94	3.42	0.29	49.80	12.06	-0.96	1.54
France	-5.60	56.25	17.08	0.32	0.21	63.31	46.74	-3.45	-5.65	67.36	26.26	-2.10	4.00	60.60	9.92	-0.52	1.58
Germany	-1.85	57.17	16.01	-1.91	0.04	71.87	50.81	-0.54	-4.33	68.57	24.35	0.18	3.15	66.03	8.84	0.65	0.91
Italy	-6.22	59.19	15.03	-4.08	2.41	64.63	44.84	0.22	-5.90	66.25	29.38	-0.88	2.41	52.56	10.75	-1.15	0.75
Netherlands	-7.02	53.38	17.63	-1.02	-0.21	61.67	39.10	-3.89	-3.53	58.99	31.66	-1.07	2.11	58.21	11.61	-0.89	1.47
Spain	-4.37	46.90	17.22	-1.16	1.23	62.19	42.09	0.12	-8.42	38.93	31.48	0.46	3.66	59.10	9.21	-1.16	0.89
USA	-8.83	56.48	18.63	-1.23	-0.20	70.67	38.31	-2.91	-6.54	70.37	31.18	-0.96	1.46	54.33	11.88	-2.54	4.09
United Kingdom	-4.34	61.27	17.97	-1.57	1.55	74.41	43.35	-2.42	-8.31	66.97	27.52	-1.75	6.26	50.79	11.15	2.27	-0.36
Unweighted Mean	-5.28	56.64	17.07	-1.36	0.58	66.41	43.16	-2.33	-5.57	61.61	29.10	-0.34	2.92	56.43	10.68	-0.54	1.36

NOTES:- Coefficients and standard errors are multiplied by 100; $\bar{S}$ is the average labour share (for each sector) between 1980 and 2000 and $\bar{V}$ is the average value added (for each sector) between 1980 and 2000. The data from Groningen Industry Productivity Database

Table A3: Aggregate Union and Employment Protection Measures

	[1]	[2]	[2]	[3]
Dependent variable		Labour Share		
Public Ownership	1.488	0.683	1.382	0.733
	(0.440)	(0.401)	(0.523)	(0.421)
Barriers to Entry	-0.531	-0.684	-0.701	-0.791
	(0.331)	(0.261)	(0.352)	(0.271)
Union Density			0.785	6.061
			(1.923)	(5.287)
Employment Protection	-6.491	-2.277	-5.548	0.609
	(1.249)	(3.316)	(1.428)	(4.069)
Fixed Effects (50)	No	Yes	No	Yes
Observations	789	789	789	789

NOTES: - Coefficients and standard errors are multiplied by 100; Employment Protection measures are drawn from the OECD (Nickell et al (2002)). The base trend is Trend*Transport. The Newey-West standard errors correct for first order serial correlation.

Table A4: Dynamic Specifications

	[1] Labour Share	[2] Ln(Employment)	[3] Ln(Wage)	[4] Labour Share	[5] Ln(Employment)	[6] Ln(Wage)
Public Ownership	1.542	1.588	-0.326			
	(0.555)	(0.944)	(1.3619			
Lagged Public Ownership	-0.603	1.448	-1.787	0.798	2.939	-2.077
	(0.526)	(1.182)	(1.309)	(0.342)	(1.070)	(0.770)
Barriers to Entry	-0.477	0.571	0.080			
	(0.325)	(0.594)	(0.589)			
Lagged Barriers to Entry	-0.122	0.135	0.457	-0.532	0.591	0.524
	(0.327)	(0.667)	(0.565)	(0.249)	(0.618)	(0.486)
Fixed Effects	Yes(54)	Yes(57)	Yes(54)	Yes(54)	Yes(57)	Yes(54)
Observations	894	1014	824	894	1014	824

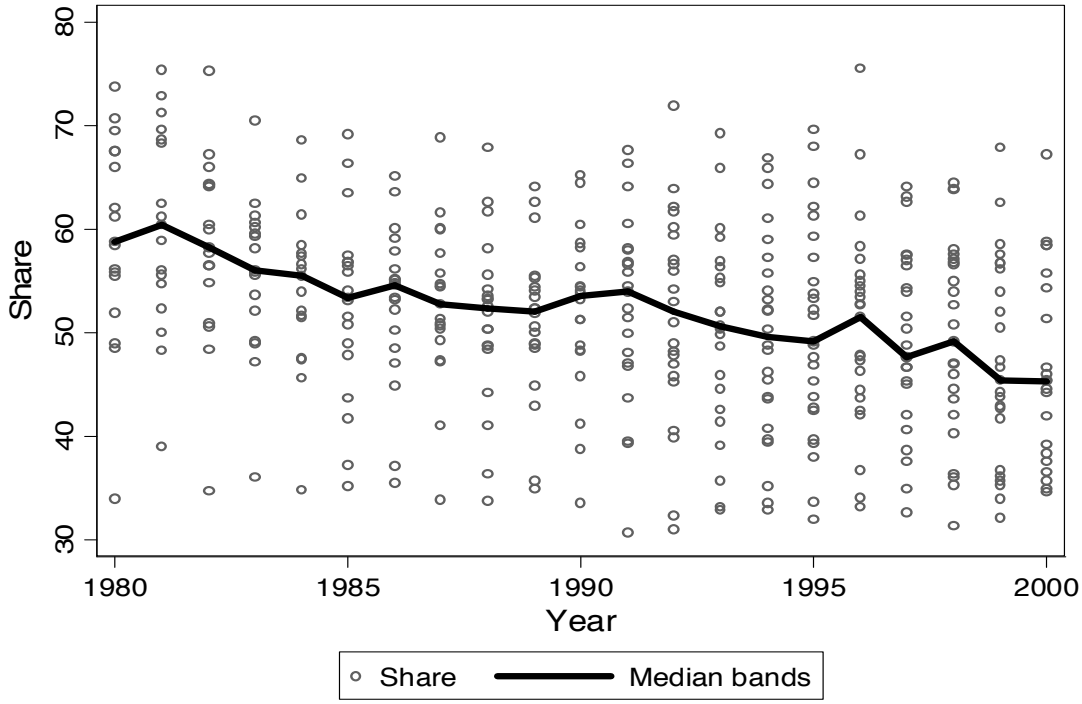
NOTES: - All coefficients and standard errors are multiplied by 100. The coefficients are from separate OLS regressions. The sample is pooled across three industries (electricity/gas, telecom and transport). "Share" is the Labour Share of Value Added. The base trend is Trend*Transport. The Newey-West standard errors are corrected for first order serial correlation.

Table A5: Restricting Sample to Non-Missing on All Variables

	[1]	[2]	[3]	[4]	[5]	[6]
Dependent variable	Labour Share		Ln(Employment)		Ln(Wage)	
Public Ownership	1.252	1.054	-9.153	2.967	-5.076	-1.874
	(0.405)	(0.361)	(2.427)	(1.191)	(1.332)	(0.741)
Barriers to Entry	-0.405	-0.379	-0.568	0.865	0.519	0.453
	(0.294)	(0.262)	(1.276)	(0.632)	(0.753)	(0.468)
Fixed Effects (54)	No	Yes	No	Yes	No	Yes
Observations	861	861	861	861	861	861

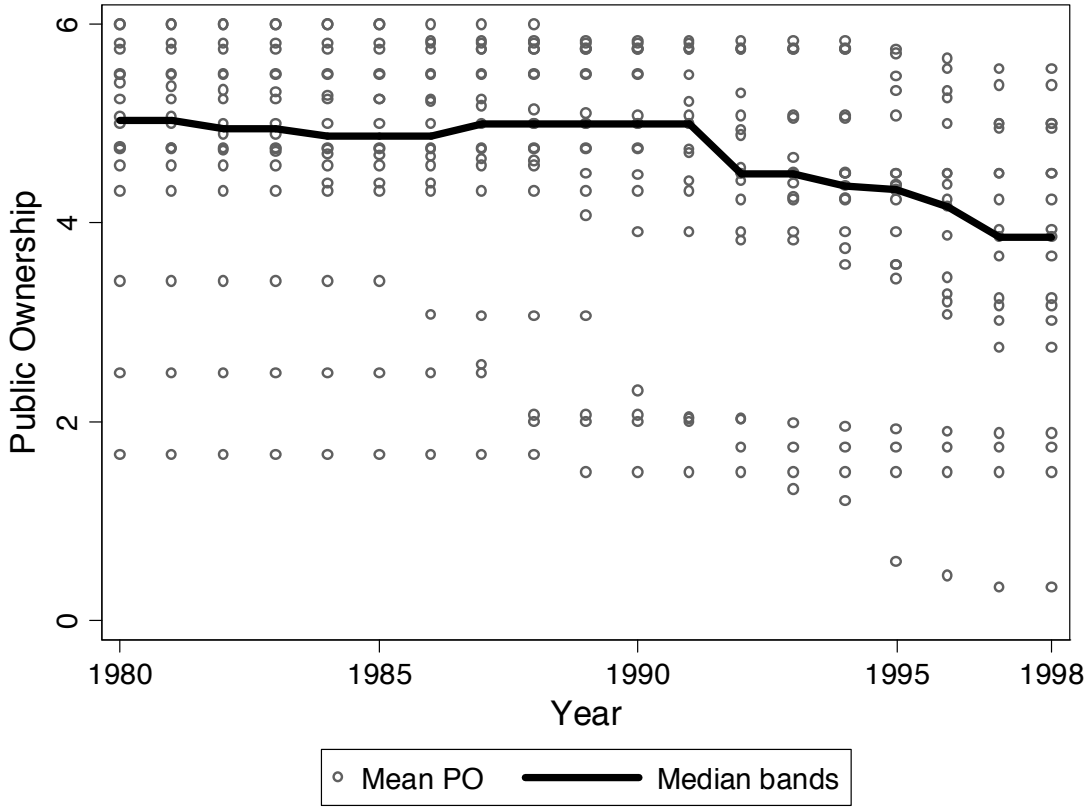
NOTES: - The specification is identical to that in column (5) and (6) of Table 3 except we restrict the sample to observations where we have no missing values on the labour share, ln(employment) and ln(wage).

Figure A1: Change in the Labour Share Across OECD Countries for Network Industries



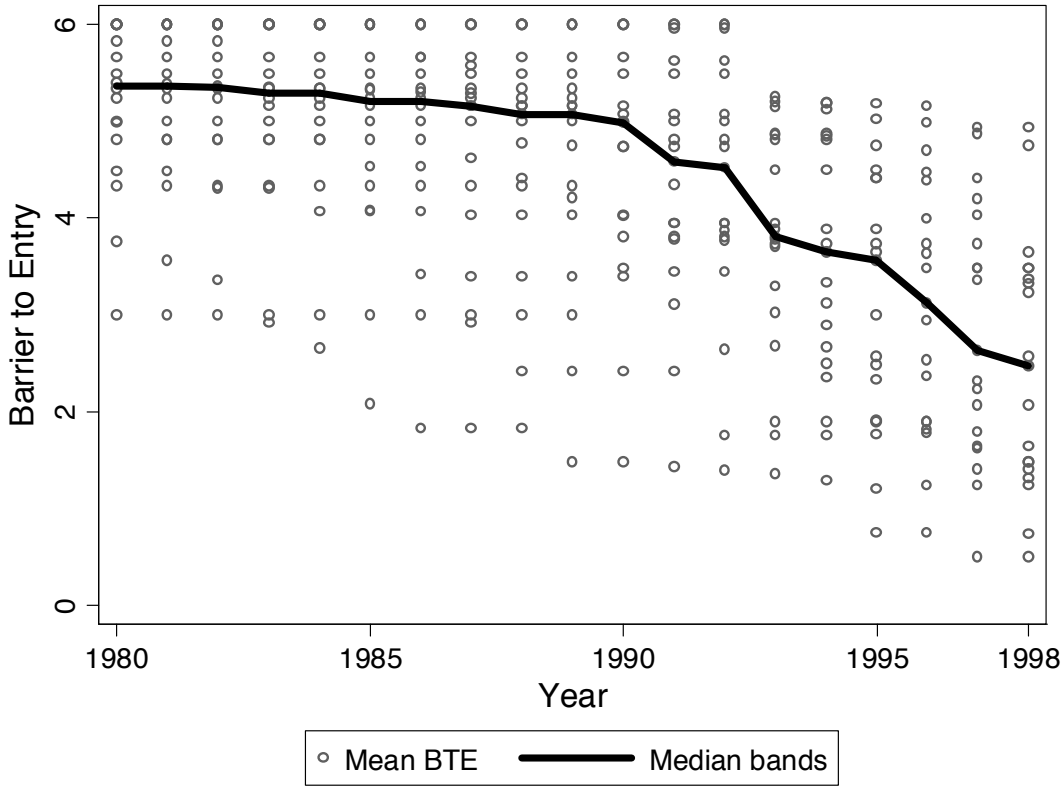
NOTES:- These are country level values of the labour share of value added in the network industries only (OECD countries, 1980-2001). Countries include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, USA, and United Kingdom

Figure A2: Average Public Ownership Index Across OECD Countries for Network Industries



NOTES:- These are country level averages of the public ownership index for the Network Industries only (OECD countries 1980-1998). The Public Ownership Index is drawn from the OECD's regulation database (Nicoletti and Scarpetta (2000, 2003a,b). Countries include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, USA, and United Kingdom

Figure A3: Average Barriers to Entry Index Across OECD Countries for Network Industries



NOTES:- These are country level averages of the public ownership index for the Network Industries only (OECD countries 1980-1998). The Barriers to Entry (BTE) index is drawn from the OECD's regulation database (Nicoletti and Scarpetta (2000, 2003a,b).