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The Employment Effects of Privatizing Public Utilities in OECD Countries

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ABSTRACT

This paper examines whether the privatization of network based utilities in developed countries leads to a retrenchment of the workforce. The panel regressions reveal, first, privatization does indeed lead to a reduction in the number of employees in the sectors concerned. Second, it is not typically the new investors themselves who implement the reduction. The downsizing takes place while the state is still the unique shareholder. Third, even though left-wing parties also implement privatization or at least not hamper, the results show that the displacement of workers is lower when left-wing parties dominate the cabinet.

1. INTRODUCTION

Since the oil crises and the rise of supply-side oriented ideas, the role of the state as an entrepreneur has been challenged to an ever greater extent (e.g. Boix, 1997; Clifton et al., 2003). From the 1980s onwards, major privatization programs have been launched all over the globe (Meseguer, 2009). One main objective of privatization has been the increase in profitability and operating efficiency of public enterprises (D´Souza et al., 2005; Pendleton, 1999; Sheshinski and López-Calva, 2003). Economists typically assume that efficiency gains following from privatization are realized by large-scale cutbacks in employment levels (Andrews and Dowling, 1998; Bortolotti et al., 2002; Megginson et al., 1994). Due to the threat of layoffs, employees, labor unions and left-wing parties strongly oppose privatization (Boix, 1997). The displacement of workers is "[o]ne of the most sensitive political issues surrounding privatization" (Andrews and Dowling, 1998, p. 604; Chong et al., 2011). The opposition to privatization is particularly high in the public utility sectors such as the postal, telecommunication or railway sectors, since the incumbents of natural monopolies are often among the largest national employers and the employees are typically very well organized in strong labor unions. Furthermore, the utility providers operated in non-competitive markets prior to privatization "with heavy government subsidies and other forms of protection" (Kikeri 1997, p. 3). Therefore, it is assumed that "[o]verstaffing is most pervasive" in the public utility sectors (Kikeri 1997, p. 3). Additionally, governments might have "hoarded" labor in those companies in order to reach employment objectives (Borghi et al., 2010).

However, are the fears of opponents to privatization really justified? Does the privatization of network based utilities indeed lead to a reduction in the size of the given provider's workforce? And if so, are the negative effects realized before or after the public

enterprise is sold to private investors? Finally, is the impact of privatization on employment mitigated by other factors such as the level of competition in the respective sector?

This paper addresses these questions by analyzing a new panel data set on the privatization of public utilities. The sample includes 40 (former) public enterprises operating in the postal and telecommunication sectors in 20[1] OECD countries for the period from 1980 until 2007. The paper contributes to the literature in the following ways. First of all, the available empirical literature on labor restructuring is "quite scarce as a result of the lack of data to address these issues" (Chong and Lopez de Silanes, 2002, p. 1; Fernandez et al., 2006). This holds especially true for network based utilities, since official databases do not contain data on the providers when they were organized as administrative bodies. Due to the insufficiency of existing data, I have generated a new database including information directly solicited from enterprises and national ministries.

Even though privatization is a highly relevant political issue, only a few empirical studies have explicitly analyzed the effect of privatization on employment dynamics. The research provides highly ambiguous empirical evidence, and the majority of the **(← p. 1165)** studies concentrate on the industrial sectors. Moreover, the literature focuses mainly on the transfer of ownership (i.e. material privatization) (Djankov and Murrell, 2002; Megginson and Netter, 2001; Sheshinski and López-Calva, 2003). Formal privatization as a further important dimension of privatization, particularly in the network based utilities, has typically been neglected. Formal privatization is the transformation of a public entity into a joint stock company without changing the ownership structure. The use of the joint-stock company form has often been a first step in a strategy which ends with the sale of shares on the stock

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[1] These are Australia, Austria, Belgium, Canada, Denmark, France, Finland, Germany, Greece, Japan, Italy, Ireland, the Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

market and thus in material privatization. I argue that the disregard of formal privatization does (at least partly) account for the mixed results provided by the literature. In this paper, I explicitly consider the effect of both formal and material privatization on employment levels. Furthermore, empirical studies mainly use descriptive statistics by comparing employment levels before and after privatization. This contribution applies a regression approach that allows controlling for other socio-economic or political influences on the change in employment. Finally, empirical studies do not typically consider the effect of conditioning factors. In this paper, by contrast, it is analyzed whether the impact of privatization depends on factors such as sector competition or the strength of left-wing parties.

The paper is organized as follows. Section 2 gives a brief overview of the literature, while section 3 presents the hypotheses on the effects of privatization on employment. Section 4 outlines methodological issues and the measurement of the data, while the empirical findings of the panel regressions are presented in section 5. Section 6 draws some conclusions.

2. LITERATURE REVIEW

At first glance, the existing empirical findings on the consequences of privatization for employment seem to be highly ambiguous. Some studies report an increase in employment while others detect a loss. When systematically evaluating the literature, it turns out that the results vary depending on whether the effects of privatization are analyzed from a general or sector specific perspective. In this literature review, cross-sector studies are reviewed first before surveying the research literature on public utility sectors.

Most empirical studies of cross-sector developments focus on the material dimension of privatization. They find that the company's workforce increases after material privatization. For example, Megginson et al. (1994) analyze 61 companies in 18 countries. They point out that 64 per cent of former public enterprises increased the number of people they employed after privatization. Boubakri and Cosset (1998) also document significant increases in employment. Efficiency gains after material privatization are achieved on average without sacrificing employment security. D'Souza et al. (2005) examine a sample of 129 share-issue privatizations in 23 OECD countries. In line with Megginson et al. (1994) and Boubakri and Cosset (1998), they **(← p. 1166)** find an expansion of the number of people in employment rather than a downsizing of employment levels. Frydman et al. (1999) analyze a panel of 2000 privatized public enterprises in the Czech Republic and observe a very moderate positive effect on employment. Kikeri et al. (1994) observe that enterprises already operating in competitive markets created new jobs as a result of new investment and dynamic expansion. Aside from large research observing an increase of employment after material privatization, a few studies find no relationship between privatization and employment. Parker and Martin (1996) find for 11 former public enterprises in the UK that the negative effects of material privatization concern the income of the enterprises allocated to employees and to a lesser degree the level of employment or the wage relativities. Bartel and Harrison (2005) emphasize that public ownership, by itself, has no independent effect on employment or productivity. In their view, public sector enterprises are only affected by agency problems when firms have been given access to government financing or are protected from import competition or foreign ownership.

Studies examining employment effects in the public utility sectors mainly observe a decrease in the company's workforce after privatization. The research project 'Privatization of Public Services and the Impact on Quality, Employment and Productivity' (PIQUE) has used a

sample of four public service sectors (electricity, postal services, local public transport and health services) in six countries (Austria, Belgium, Germany, Poland, Sweden and the UK) to analyze the effect of material privatization, for example, on labor. They emphasize that in most countries privatization has led to a massive reduction in employment and a higher workload particularly in the electricity and postal sectors. Based on a broad survey, PIQUE shows that (material) privatization and liberalization have strengthened the modification of labor relations with the emergence of a two tiered workforce containing civil servants at the core and private sector workers as the periphery. Furthermore, a transfer of public ownership to private investors has been associated with a deterioration of working conditions caused by wage dumping and labor cost competition (PIQUE 2009, p. 46). Clifton and Díaz-Fuentes (2008) focus on the consequences of the transformation of public service providers for labor. They observe for telecommunications, postal services and electricity that employment declined after restructuring networks based utilities and that new employment was contracted on more flexible terms than previously. Analyzing the telecommunication market in New Zealand, Boles de Boer and Evans show that the workforce of this sector was reduced to a great extent after privatization (Boles de Boer and Evans 1996). Bortolotti et al. (2002) find a very modest decline in employment in the telecommunication sector in the post-period of material privatization. Borghi et al. (2010) consider electricity firms in 24 EU countries. They state that public companies have a bigger workforce compared to private firms "in line with the view that state and government-owned firms may have an explicit employment objective" (Borghi et al., p. 12). Based on survey data Hall (1997) analyzed employment changes in water and energy companies surrounding material privatization and states **(← p. 1167)** "that the workers concerned were transferred to the new employer" and hence the workforce remained stable (Hall 1997, p. 35).

Overall, the following conclusions can be drawn from the literature review. First, it can be maintained that studies with a focus on general effects mainly see an increase in

workforce, while studies analyzing the effect of privatization on network based utilities often detect a loss in employment. But why do these differences exist? In this paper, I argue that one central reason for the mixed results is the concentration of cross sector studies on material privatization (e.g. D´Souza et al., 2005; Megginson et al., 1994). They neglect the effects of formal privatization which has frequently been implemented in the network-based utilities sectors. Second, cross sector studies within a quantitative empirical framework dealing with the impact of privatization on employment stems mainly from economists (e.g. Andrews and Dowling, 1998) who typically analyze the effect of privatization on efficiency and profitability at the company level. These studies do not develop the effect of privatization on employment in detail. The consequences for employment are - if at all – only briefly addressed. Third, studies that focus on public utility sectors are often small-N comparisons (e.g. Pique, 2009) or case studies (e.g. Boles de Boer and Evans, 1996; Newbery, 1997). The effects of privatization on employment are often discussed qualitatively or based on descriptive statistics, but rarely within a more general regression framework. The findings are mostly limited to special case.

In this paper, the drawbacks mentioned are addressed by explicitly focusing on the effects of formal and material privatization on employment. When taking the effects of both forms of privatization into account, the mixed results provided by the empirical literature become less puzzling. It can be shown that the negative effects mainly appear after formal privatization – the form of privatization that can be encountered more frequently in the public utility sectors. Material privatization, in contrast, is often associated with a gain in employment. This is shown for a broader country sample within a regression framework, which allows controlling for confounding variables. Furthermore, it is argued that the impact of privatization depends on conditioning factors such as sector specific competitive pressure.

3. PRIVATIZATION AND CHANGES TO THE WORKFORCE OF THE PRIVATIZED ENTITY – THEORY AND HYPOTHESES

How does privatization in general and formal and material privatization in particular affect the level of employment? In general and from a microeconomic perspective, public enterprises are seen as being overstaffed before privatization due to the following reasons (OECD, 2010). First, public enterprises (in contrast to private companies) do not typically have hard budget constraints. They have access to the public budget and cannot face bankruptcy (Kornai et al., 2003). Therefore the pressure to operate cost-efficiently is relatively low. The threat of financial distress and the pressure set by the **(← p. 1168)** capital markets is of less relevance for public enterprises than for private companies (Megginson and Netter, 2001). Debt markets cannot play the role of disciplining managers because the debt of public enterprises is public debt (Vickers and Yarrow, 1989). Hence, the constraints for labor costs are higher in private companies than in public ones. Second, public enterprises pursue objectives that differ from those of private firms (Sheshinski and López-Calva, 2003, p. 431). In contrast to private owners, who generally seek to maximize the profit of the firm, governments have many objectives other than profit maximization. "One key objective of politicians is employment" (Boycko et al., 1996, p. 309). For politicians who control public enterprises, the political benefits of extensive employment and "labor hoarding" are higher than the costs that arise due to efficiency losses. Therefore, governments might seek to maximize employment, possibly at the cost of efficiency (Sheshinski and López-Calva, 2003, p. 434). Third, public enterprises face less monitoring because they are not traded on the stock market and are therefore not confronted with the threat of take-over (Vickers and Wright, 1989).Soft budget constraints combined with interference in commercial decisions exercised by politicians and self-serving bureaucrats have been seen as major reasons for the inefficiency, and thus the overstaffing, of public enterprises (Meseguer, 2009; Shapiro and Willig, 1990). This holds true especially in the public utility sectors due to

the societal relevance of the services provided. Furthermore, public utility sectors are often natural monopolies where only a single firm operates without needing to compete with other companies (Bartel and Harrison, 2005, p. 135; Sheshinski and López-Calva, 2003, p. 433). With privatization, soft budget constraints are hardened and the firm's objective function is modified towards profit maximization. Privatization exposes managers to the pressure of financial markets and to the monitoring and discipline of profit-oriented investors (Biglaiser and Brown, 2003; D´Souza et al., 2005). This leads to an increase in efficiency and productivity through a reduction in the number of employees and therefore labor costs.

H1: The number of those employed is reduced after privatization.

Two different perspectives exist in the research literature with regard to the timing of layoffs associated with privatization: The first perspective assumes that the enterprise's workforce is reduced before the government sells any shares to private investors (Dewenter and Malatesta, 2001; Kikeri, 1997), while according to the second view the private investors themselves reduce the workforce (Bortolotti et al., 2002). I argue that both perspectives can be captured by differentiating between formal and material privatization. Formal privatization denotes the transformation of an administrative body or a public enterprise governed by public and special law into an organizational form governed by private law such as a joint stock company. The objectives of administrative bodies that are attached to a given ministry (without having their own legal personality) and of public enterprises governed by public law are typically defined by a law or a statute. In contrast, an incorporated company is subject to the same rules as private **(← p. 1169)** companies even though the state remains the sole shareholder. A commercial management team is contracted and put in place by the government (Bös, 1986). Material privatization, however, refers to the divestment of public shares to private buyers for the first time. Formal privatization often

paved the way for material privatization since it is not possible to sell shares when the public enterprise is not formally privatized (Clifton et al., 2006; Levi-Faur, 2003).

In the first perspective, the labor force is reduced by governments during and in the aftermath of formal privatization and before material privatization. Reducing the number of those in employment might occur when public enterprises are prepared for sale in order to increase their attractiveness and thus their value. In this view, reducing the size of the respective workforce is "the result of the governments' efforts to revamp the firms before divesting them" (Dewenter and Malatesta, 2001; Kikeri, 1997; La Porta and López-de-Silanes, 1999, p. 1206). Moreover, in many countries employees in the public utility sectors (partly) have "special entitlements such as civil servant status, employment for life or privileged pension plans" which might "deter potential buyers" (OECD, 2002, p. 22). Governments might therefore assume the responsibility for reducing the size of the respective enterprise's workforce in order to reduce the burden of politically sensitive restructuring measures on private buyers and to ensure that the social consequences are properly addressed (Kikeri, 1997).

From a second perspective, it is argued that the "decision to retain or dismiss labor should be left to the new private investors" (Bortolotti et al., 2002, p. 260). The reduction of workforce should therefore occur after material privatization. Private investors are thus "in a better position to judge the level of employment and kind of skills needed in a privatized enterprise" (Kikeri, 1997, p. 1). Furthermore, a large-scale downsizing of labor might be associated with high political costs for the government concerned. Therefore, political actors might reject this responsibility and shift the burden of making layoffs to private actors. Moreover, the rationale for reducing the size of a company's workforce, which includes hardening budget constraints and moving towards the objective of profit maximization,

might not be fully in place until the transfer of ownership rights takes place. Against this backdrop it is possible to deduce the two hypotheses.

H1a: The reduction of employment is implemented particularly during and after formal privatization, when the state remains the sole shareholder, and before the sale of shares to private investors.

H1b: The new investors are the ones that implement the reduction of employment. This downsizing of the enterprise's workforce takes place after material privatization.

Furthermore, the impact of privatization depends on several conditioning factors. The effect of material privatization should depend on the percentage of shares sold by the state. If the state still holds a large portion of the shares after material privatization, **(← p. 1170)** politicians can still wield influence over the enterprise for the purposes of achieving political goals (Sheshinski and López-Calva, 2003, p. 436; Kikeri, 1997). When the government plans to divest a large part of the shares, the pressure to increase the attractiveness of the company and to restructure and reduce employment is higher than if it remains the majority shareholder.

H2: The effect of material privatization on employment is stronger if the percentage of residual shares held by the state is low.

However, whether privatization is associated with a decrease or an increase in employment also very likely depends on sector constraints and the relevant political actors and their objectives.

The effects of privatization are assumed to be interrelated with sector competition (Bartel and Harrison, 2005). A different competitive environment is likely to directly affect the impact of privatization on changes in the employment level (Sheshinski and López-

Calva, 2003, p. 451). From a public choice perspective, public enterprises in non-competitive environments with high entry barriers perform more poorly in comparison to public enterprises in liberalized markets, since they are not forced to compete with other firms for market shares and customers (Djankov and Murrell, 2002). The pressure to reduce employees is more intense in liberalized markets. "Privatized firms operating in competitive industries are more inclined to reduce employment levels" (Bartel and Harrison, 2005, p. 138; Brandt and Schulten, 2007; Kikeri, 1997).

H3: Privatization in markets with large entry barriers and low competitive pressure leads to smaller lay-offs than in competitive environments.

Furthermore, the effects of privatization on employment are also likely to depend on the actors responsible for the restructuring process. Due to the threat of layoffs, the loss of social privileges and benefits, and changes to work rules, labor unions and state enterprise workers are amongst the most powerful opponents of privatization (Kikeri, 1997; Megginson et al., 1994; PIQUE, 2009). Employees in public utility sectors are typically very well organized. They often benefit from a special work status with a high degree of job security, rigid labor contracts and relatively high wages (OECD, 2005). Employees and labor unions belong to the core electorate of left-wing parties.[2] The political costs for left-wing parties of a large-scale downsizing of the workforce in the context of privatization would be relatively high compared to those of other parties (Boycko et al. 1996, p. 309). This leads to the following hypothesis.

H4: A strong representation of left-wing parties in government can be expected to mitigate the negative impact of privatization on the level of employment. (← p. 1171)

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[2] The influence of union power on the effect of privatization cannot be directly tested since no sector specific data on union density is available.

4. DATA AND METHODOLOGY

The sample includes 40 postal and telecommunication sector providers from 20 OECD countries and covers the period from 1980 to 2007.[3] I focus on the telecommunication and postal sectors for the following reasons. Not only are these sectors regarded as services of general economic interest, they are also particularly relevant in economic terms and highly labor intensive (Brandt and Schulten, 2007; Chong and Lopez de Silanes, 2002). About two per cent of all employees work in the postal and telecommunication sectors (OECD, 2011). Therefore, the question of the consequences of privatization in the telecommunication and postal sectors is of particular relevance. The data on employment as well as on formal and material privatization was gathered from national ministries and public enterprises which provided annual reports from their archives (particularly for the 1980s). Based on this information, a new data set was compiled which has not previously been accessible to scholars. The dataset contains information at the firm level on an annual basis. It includes the number of employees of each enterprise, the percentage of shares held by the state and the organizational form (e.g. administrative body, joint-stock company etc.). The dataset makes it possible to analyze the effect of different privatization measures on employment dynamics of public enterprises.

Before analyzing the effect of privatization on the given enterprise's employment levels in greater detail using panel regressions, the development of the workforce of the postal and telecommunication providers before and after formal and material privatization is outlined. Table 1 displays the average number of employees at the company level in the

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[3] The countries are Australia, Austria, Belgium, Canada, Denmark, France, Finland, Germany, Greece, Japan, Italy, Ireland, the Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

years before and after formal and material privatization for all firms in the postal and telecommunication sectors. In line with the economic literature (e.g. Megginson et al., 1994) I have selected a seven year period. This means that the average number **(← p. 1172)** of employees in the three years before and in the three years after privatization is reported.

Table 1: Employment Levels Before and After Privatization

	N	Mean before Privatization (t-3 to t-1)	Mean after Privatization (t+1 to t+3)	Change of Mean	Percentage of Firms that reduced Employment
Formal Privatization					
Total	25	86,395	80,822	-5,573	59.26%
Postal	11	82,965	75,453	-7,512	69.23%
Telecommunication	14	89,579	85,809	-3,770	50%
Material Privatization					
Total	21	85,089	82,707	-2,382	69.56%
Postal	6	79,192	86,566	7,374	50%
Telecommunication	15	83,930	77,894	-6,036	80.0%

Notes: The table displays the mean of the total number of employees across all companies of the sample, separated by sector and the form of privatization.
(← Table 1 p. 1172)

The table shows some interesting details. After formal privatization, the labor force was on average reduced in the postal sector as well as in the telecommunication sector. However, in comparison to the telecommunication sector, the number of employees in the postal sector decreased to a greater extent. About 70 per cent of postal service providers reduced the size of their workforce, whereas in the telecom sector just half of the enterprises did so. For example, the German postal service provider 'Deutsche Post AG' had almost 300,000 employees in 1994, one year before the company was formally privatized. In the following three years, the number of employees was reduced to 266,000. Yet, regarding the material privatization, it is only in the telecommunication sector that the average number of employees is lower after privatization. 80% of the telecommunication providers reduced their labor force. Belgacom, for example, reduced its staff by a factor of approximately five and Telecom Corporation New Zealand took leave of one-third of its employees in the

aftermath of the divestment of public shares. In the postal sector approximately the same number of companies increased their employment level compared to those which did not. In fact, the mean number of employees in the postal sectors increased by 7,374 and is about ten percent higher than in the year of privatization. However, one should not lose sight of the fact that to date only six postal providers have been materially privatized across the OECD. The majority of postal providers are still 100% state owned.

Panel estimation techniques are now applied in order to test the influence of privatization on workforce dynamics. Panel regressions allow us to control for possible confounding variables and to analyze potential conditioning factors.

The dependent variable is the annual change in the given provider's number of employees (t1-t0) relative to the number of employees at t0. The central independent variable is formal and material privatization. Formal privatization is the change of the organizational form, i.e. the transformation of an administrative body or a public enterprise governed by public law into a joint stock company, whereas material privatization refers to the government selling shares to private investors (see the concept of privatization above). Formal as well as material privatization is captured with several dummy variables. The first dummy variable is set equal to 1 in the year in which the formal or material privatization occurred (Event Year). In the case of material privatization, the event year refers to the year when the company was listed on the stock market and shares were sold to private buyers for the first time. To get a more comprehensive picture of the dynamics of the impact of privatization on employment, the whole process as well as the pre- and post-privatization period is captured with dummies. The variable covering the pre-privatization period (Pre-Period) equals 1 for the three years before the privatization was implemented (year t-3 to t-

1) and 0 for all other years.[4] The post-privatization dummy (<u>Post-Period</u>) equals 1 for the three years following privatization (year t+1 to t+3) and 0 otherwise.[5] Finally, the (**← p. 1173**) <u>Privatization Process</u> variable is equal to 1 in the year of formal privatization and ends with the start of the material privatization.

Interaction effects are estimated in order to test whether the impact of privatization depends on the percentage of shares sold by the state, the level of competition or the strength of left-wing governments. The interaction terms are generated via cross products. Hypothesis 2 assumes that the effect of material privatization is reinforced when the state sells a large percentage of shares. Public ownership (<u>Public Shares</u>) is therefore measured by the percentage of equity owned by the central government (Bartel and Harrison, 2005, p. 139). The model which tests the influence of competition on the impact of privatization includes the interaction between privatization and the level of sector-specific barriers to market entry (<u>Entry Regulation</u>). Data on market entry regulation in the postal and telecommunication sectors are provided by the OECD (Conway and Nicoletti, 2006). Finally, the percentage of cabinet seats controlled by left-wing parties is used to test whether the strength of left-wing parties in government mitigate the effect of privatization (<u>Left Government</u>).

A number of control variables are included which might also affect the annual change in employment levels. The size of the enterprise (<u>Firm Size</u>) is controlled for by including the logarithm of the operating revenues (Dewenter and Malatesta, 2001). Regarding the firm size, two competing hypotheses can be derived. First, larger firms might in the past have

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[4] The pre-period of all companies with the exception of British Telecom (BT) falls into the period of observation. I estimated the models without BT. The results do not change.

[5] Selecting a seven year period (three years before and after privatization plus the event year) is the standard approach in the economic literature (Megginson et al., 1994). Robustness tests using longer and shorter time spans in the panel regressions do not provide different results.

benefited from greater state support or soft financing due to their political and economic importance and should, according to this viewpoint, have bloated employment levels (D´Souza et al., 2005; Djankov and Murrell, 2002; Frydman et al., 1999; Megginson and Netter, 2001). Therefore, a large company should be associated with a large potential for labor force reduction. Second, it is arguable that larger firms are less affected by the shock of transition and are often more difficult to restructure (Frydman et al., 1999). Furthermore, the overall state of the economy should also influence the development of employment levels in the public utility providers. In times of overall economic growth (GDP growth), the reduction in the size of the provider's workforce should be lower than in times of economic austerity. The change in the unemployment rate (Δ Unemployment) must also be taken into account to control for general developments in the labor market as a whole. With regard to international influences, the openness of the economy (Trade Openness) measured by the sum of imports and exports in relation to GDP might also have an influence on the employment development at the company level. From one perspective, the pressure on the firms to increase efficiency should be higher in open economies. However, from a different perspective, a highly open economy might have positive effects on employment levels, since the companies take part in the international market and therefore benefit from the openness of the economy. The strength of the labor unions (Union density) is measured by the percentage of employees organized in unions.[6] It is assumed that a high union density will be associated with a smaller decrease in employment **(← p. 1174)** levels than would otherwise be the case. The measurement and source of all variables is described in Table A1 in the appendix.

When estimating panel regressions, several pitfalls exist. The Wooldridge test for serial correlation indicates first order autocorrelation of the residuals (Wooldridge, 2002).

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[6] As mentioned, only overall data is available, and not sector-specific international comparative data.

Therefore, the models are estimated with autoregressive disturbances. To account for panel heteroscedasticity, the models are estimated with robust standard errors. The Hausman test suggests running firm fixed effects models in order to capture unobserved unit heterogeneity.

5. EMPIRICAL RESULTS

Table 1 reports the results of the panel regressions for the postal and telecommunication sector providers. The first model tests the hypothesis of whether privatization leads to a reduction of the provider's employees. It includes privatization dummies for the event years of formal and material privatization. The results clearly sustain hypothesis H1. Both formal and material privatization are associated with a decrease in the size of the provider's workforce. The transformation of public enterprises into profit maximizing joint stock companies, as well as the transfer of ownership, puts pressure on the management to reduce labor costs in order to increase efficiency.

Models II and III analyze the effect of privatization in greater detail and include the pre-privatization and post-privatization period of formal (model II) and material (model III) privatization. Model II shows that layoffs do not take place before the formal privatization process. The coefficient for the pre-period is close to zero. The labor force is scaled down during the Event year and in the post period (years t+1 to t+3) of formal privatization supporting hypothesis H1a. The coefficients of the Event year (-.034) and the Post-period (-.017) indicate a predicted immediate cutback in the company's work force of 3.4 per cent and a reduction of 1.7 per cent in the post-privatization period. With regard to the material privatization (model III), only the coefficient of the event year of material privatization is negative and statistically significant at the 1 per cent level. In contrast to formal privatization, the effect in the post-period is close to zero, indicating no further employment

reductions. This empirical evidence contradicts hypothesis H1b. Model IV therefore includes a variable for the privatization process which equals 1 from the year of formal privatization until the start of material privatization (and is otherwise 0). The coefficient is highly statistically significant. The predicted annual employment reduction between the two privatization events is about 2 per cent. To arrive at a more comprehensive picture, I have analyzed the coefficients of each year during the privatization process.[7]

Table 2: Effect of Privatization on the Percentage Change of Firm Level Employment

Dependent variable: Annual percentage change in employment				
Independent variables	I	II	III	IV
Privatization Process				-.022*** (.006)
Formal Privatization				
Pre-Period		.003 (.007)		
Event Year	-.030* (.017)	-.034**(.014)		
Post-Period		-.017*(.009)		
Material Privatization				
Pre-Period			.017 (.019)	
Event Year	-.051*** (.017)		-.050*** (.017)	
Post-Period			-.003 (.012)	
Firm Size	.023** (.010)	.023*** (.008)	.022***(.008)	.023*** (.008)
GDP per capita	-4.86e-07 (7.47e-07)	-4.90e-07 (8.81e-07)	-6.31e-07 (9.07e-07)	-4.58e-07 (8.74e-07)
GDP growth	.004** (.002)	.004** (.002)	.004*** (.001)	.004*** (.001)
Δ Openness	.001* (.0007)	.001** (.0006)	.001**(.0006)	.001** (.0006)
Δ Unemployment	-.445* (.226)	-.435** (.206)	-.468**(.220)	-.464** (.205)
Entry Regulation	.002 (.002)	.002 (.002)	.001(.002)	.002 (.002)
Union Density	.0009 (.0006)	.001 (.0008)	.0009(.0008)	.0009 (.0007)
Left Government	6.04e-05 (.0001)	5.71e-05(.0001)	6.88e-05 (.0001)	7.13e-05 (.0001)
F	6.31***	4.34***	6.76***	5.56***
N	868	868	868	868

Notes: Privatization process equals 1 from the year of formal privatization until the start of material privatization and is otherwise 0; The pre-period refers to the year t-3 through t-1 before privatization and the post-period to year t+1 to t+3 after privatization; All models are fixed effects model specifications, The models are estimated with heteroscedasticity-consistent variance estimators, * p<.1 **p<.05 *** p < .01

(← Table 2 p. 1176)

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[7] That means including dummies for formal privatization at time t, at t+1, t+2 until the material privatization takes place.

The results show that the reduction of employment is strong in the year of formal privatization and gradually becomes weaker in the years after formal privatization and statistically insignificant in the pre-period of material privatization. Only in the year when the material privatization starts is the coefficient negative and statistically significant once (**← p. 1175**) again. One reason might be that governments want to improve the firm's performance records in order to make the company attractive to private investors when the company is listed in the stock market.

The empirical findings clearly support the hypothesis (H1a) that it is not private investors who implement the reduction in the size of the providers' workforce; the cuts take place during and after the organizational transformation of the enterprise, i.e. when the government is still the sole shareholder. Why? In 100 per cent of publicly-owned companies the commercial management contracted by the government implements the employment reduction strategies. However, it might be rational for the government to make use of its possibilities[8] to influence and force the contract managers to implement the reduction in the size of the workforce. An efficient operating company increases the attractiveness of the company for new investors and therefore increases the chances of the government gaining high privatization proceeds. Moreover, the blame for the decrease in employment can be shifted from the government to the new management. Additionally, in the case of an efficient operating company the government does not have to compensate for potential losses. And last but not least, due to the public servant status of the employees in many countries, transforming the public enterprise into a joint stock company often provides the legal basis that is needed to reduce the number of personnel (OECD 2002).

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[8] Even though the government gives autonomy to the contracted management, the government or the responsible ministry often defines the management contract and supervises the finances of the company. Representatives of the government are furthermore in all organs of the company (Lane, 2000).

Overall, the results remain stable even when running the regressions only for the subsample of telecommunication providers or the subsample of postal companies (not displayed). The first empirical signs in section 3 that the development is different in the two sectors cannot be further sustained. The results show that the commonly used descriptive statistics which fail to control for other explanatory factors may be misleading.[9]

The results for the control variables are mainly in line with the theoretical assumptions. In times of economic prosperity the companies increase the workforce rather than lay off employees. The coefficient is statistically significant at the 1 per cent level. Furthermore, the development of employment at the firm level is similar to the general development of unemployment. An increase in the openness of the economy is positively related to the level of employment in the postal and telecommunication sector providers. The companies seem to participate in the international trade flows and benefit from open markets. Firm size positively affects the annual percentage change in the company employment level. This sustains the assumption that big companies are not affected as much as small companies by the transition. The strength of labor unions and left-wing governments as well as the extent of market entry regulations do not appear to exert a substantive influence on the change in employment.

The effect of privatization might depend on the sector specific constraints or the actors who implement the privatization. Table 2 displays findings concerning whether the

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[9] It might be argued that the results are driven by technological differences between the sectors or technological progress within one sector. I therefore applied several robustness checks. First, I added sector dummies controlling for systematic differences in the employment dynamics between both sectors. Second, I estimated the models including an interaction effect (sector dummy*privatization) checking whether the effect of privatization is different between the sectors. Third, I added time dummies and alternatively a linear trend variable to control whether technological progress that affects all companies in one sector drives the results. The results remain stable across all robustness checks.

impact of privatization is conditioned by other factors. The coefficients of the interaction variables indicate the change of the coefficient of the privatization variable depending on the residual public shares (Model V), different levels of market entry regulation (Model VI) and the strength of left-wing parties in government (Model VII). **(← p. 1177)**

Table 3: Conditioning Factors for the Effect of Privatization

Dependent Variable: Annual percentage change in employment			
Independent Variables	V FE PUBLIC SHARES	VI FE ENTRY REGULATION	VII FE LEFT
Formal Privatization (Event year)		-.010(.024)a	-.019(.015)a
Formal Privatization x Conditioning Factor		-.006(.005)	-.0003(.0004)
Material Privatization (Event year)	-.160*** (.053)a	-.090***(.032)a	-.091***(.034)a
Material Privatization x Conditioning Factor	.002**(.0008)	.012*(.006)	.0009*(.0005)
Public Shares	2.53e-05(.0002)		
Firm Size	.018* (.009)	.019**(.008)	.019**(.008)
GDP per capita	-4.69e-07 (7.12e-07)	-4.22e-07(7.40e-07)	-3.60e-07(7.32e-07)
GDP growth	.004*** (.001)	.004***(.001)	.004***(.001)
Δ Trade Openness	.001**(.0005)	.001**(.0005)	.001**(.0005)
Δ Unemployment	-.338*(.188)	-.364*(.191)	-.332*(.191)
Entry Regulation	.0009(.002)	.001(.002)	.002(.002)
Union Density	.0008(.0008)	.0009(.0007)	.0008(.0007)
Left Government	5.51e-05(.0001)	5.21e-05(.0001)	4.60e-05(.0001)
F	13.29***	10.79***	24.10***
N	868	868	868

Notes: All models are fixed effects model specifications, The models are estimated with heteroscedasticity-consistent variance estimators, * $p<.1$ **$p<.05$ *** $p < .01$; a: The significance level only refers to the situation when the other part of the interaction term equals 0

Table 3 summarizes the impact of background factors by displaying the coefficient and the standard error of material privatization depending on different values of residual public shares, the strength of left-wing parties and the market entry regulation.

The empirical findings reveal several interesting details. The hypothesis H2 that the reduction of employment in the year of material privatization is higher when the state sells a large amount of shares is strongly supported by the empirical analysis. For example, when the state divests itself of 50 per cent of its shares, the coefficient equals -.076 indicating a predicted reduction in employment of 7.6 per cent. In the case of a complete divestment (i.e. 100 per cent of public shares sold), the estimated cutback is about 16 per cent (see table 3). The greater the retreat of government from the provision of public utilities, the stronger the negative effects of privatization on employment.

Model VI tests whether the impact of privatization is stronger in a highly competitive sector (i.e. low entry barriers). In hypothesis 3, it was argued that competition **(← p. 1178)** reinforces the effect of privatization. This assumption is backed up by the empirical evidence relating to material privatization. A one point increase in the extent of entry barriers mitigates the effect of privatization by .012. When barriers to market entry are at their maximum, the predicted cutback of the company's workforce during material privatization is 1.5 per cent, whereas at their minimum an 8.7 per cent decline is expected (see table 3). In a more competitive environment, managers are likely to be forced to cut labor costs to a greater extent.

Model VII tests the influence left-wing parties have on employment (H4). Left-wing parties might give greater consideration to the fears of the labor unions and employees than right-wing or centrist parties, since labor unions and employees belong to the core electorate of left-wing parties and typically oppose privatization measures strongly. The coefficient of the interaction term is positive and statistically significant for material privatization supporting hypothesis H4. A high percentage of cabinet seats held by left-wing parties in the government eases the negative effect of privatization on employment if there is a government sell-off of shares. This is an interesting finding, particularly when one considers

that a direct effect of left-wing governments on the dynamics of the workforce is not observed.

Table 4: Coefficient of the Event Year of Material PrivatizationAccording to the Conditioning Factors

Residual public shares	Coefficient (standard error)	Left	Coefficient (standard error)	Market entry regulation	Coefficient (standard error)
0	-.160(.054)	0	-.091(.034)	0	-.087(.031)
25	-.118(.036)	25	-.068(.022)	1.5	-.069(.023)
50	-.076(.021)	50	-.045(.014)	3	-.051(.016)
75	-.034(.015)	75	-.022(.016)	4.5	-.033(.012)
100	.007(.028)	100	.001(.027)	6	-.0t15(.015)

Notes: The coefficients and standard errors were manually calculated.

5. CONCLUSION

The impact of privatization on employment is a highly relevant and politically sensitive issue, often characterized by lively and emotive discussion (Andrews and Dowling, 1998). This study has analyzed whether formal and material privatization has led to a reduction of the company's workforce in 20 OECD-countries over the last 30 years. Overall, the following empirical findings stand out. Privatization does indeed lead to a reduction in the size of the given provider's workforce in the utility sectors. At first glance, this result stands in contrast to the positive employment effects found in studies focusing on privatization in industrial sectors. However, when distinguishing between formal and material privatization, the contrast becomes dismantled. While the negative effects mainly appear after formal privatization, material privatization is often associated with a gain in employment. Since **(⬅ p. 1179)** industrial companies have usually always been private law companies operating in competitive environments, they have only marginally been affected by formal privatization processes and

therefore a loss in employment. Overstaffing and labor hoarding is much more connected to administrative bodies and public law companies that were common in public utility sectors than to private law companies owned by the state. The downsizing of the workforce starts with the transformation of the public enterprise into a joint stock company and ends with the beginning of the government's sale of shares to private buyers. In other words, it is not typically the new investors who implement the reduction in the size of the given provider's workforce. The reduction is conducted in times when the state remains the sole shareholder and the company is being prepared for floatation on the stock market. It is likely that it is the intended selling-off of shares to private actors that gives rise to the need to save costs and to increase efficiency. A blame avoidance game seems to be at play in which political as well as private actors pass the buck to the other side for cutting back employment levels. Furthermore, the impact of privatization depends on conditioning factors. The greater the retreat of the state from the postal and telecommunication service provider (i.e. the higher the percentage of shares sold), the higher the impact of privatization. Moreover, intense competition increases the number of layoffs induced by material privatization. Finally, left-wing parties are often accused of implementing privatization or at least not hampering it. However, the results show that it does make a difference which party sells the public enterprises. The displacement of workers in the course of material privatization is lower when left-wing parties dominate the cabinet. Party differences arise when it comes to the implementation of privatization programs. In sum, this paper shows that the effect of privatization differs depending on the form of privatization that takes place. In a next step, more qualitative aspects of the effect of privatization on employment would have to be analyzed. For example, it still remains unsolved, at least from an international comparative perspective, whether privatization leads to a deterioration of working conditions or an increase of precarious employment. **(← p. 1180)**

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Appendix

Table A1: Variables, Measurement and Sources

Variable	Description	Source
Dependent variable: change in employment	Annual percentage change in the company's total number of employees	Own source
Privatization Process	Dummy that equals 1 from the year of formal privatization until the start of material privatization and 0 in all other years	Own source
Formal Privatization		
Pre-Period	Dummy that equals 1 in the three years before formal privatization is implemented and 0 in all other years	Own source
Event Year	Dummy that equals 1 in the year when formal privatization is implemented and 0 in all other years	Own source
Post-Period	Dummy that equals 1 in the three years after formal privatization is implemented and 0 in all other years	Own source
Material Privatization		
Pre-Period	Dummy that equals 1 in the three years before material privatization is implemented and 0 in all other years	Own source
Event Year	Dummy that equals 1 in the year when public shares are sold for the first time and 0 in all other years	Own source
Post-Period	Dummy that equals 1 in the three years after material privatization is implemented and 0 in all other years	Own source
Firm Size	Logarithm of the company's operating revenues from sales	Own source
Public Shares	Percentage of shares hold by the state	Own source
GDP per capita	Real GDP per capita	UN (2009)
GDP growth	Growth of real GDP	OECD (2008)
Δ Trade Openness	Change in the sum of exports and imports as a percentage of GDP	Heston et al. (2009)
Δ Unemployment	Change in the unemployment rate as a percentage of the civilian labor force	Armingeon et al. (2008)
Entry Regulation	Index that measures the sector specific legal conditions of market entry; the index has a range from 0 to 6 where 0 = free entry and 6 = market entry is highly regulated; see for a detailed description Conway and Nicoletti (2006)	OECD (2010)
Union Density	Net union membership as a proportion of wage and salary earners in employment	Armingeon et al. (2008)
Left Government	Cabinet seats of left-wing parties as a percentage of total cabinet posts (weighted by days)	Armingeon et al. (2008)