TranState
Working Papers

New Public Management Reform in European Countries: The Retreat of the State from Telecommunication Services

Carina Schmitt
Philipp B. Schuster

No. 116

Carina Schmitt
Philipp B. Schuster

New Public Management Reform in European Countries: The Retreat of the State from Telecommunication Services

New Public Management Reform in European Countries: The Retreat of the State from Telecommunication Services

ABSTRACT

In the post-war period, telecommunications – being services of "general economic interest" – were initially managed by public administrative bodies in many Western European countries. With the rise of New Public Management (NPM) in the 1980s, these bodies were often transformed into public corporations or joint stock companies. Following corporatisation, the provision and the management of these services of general economic interest was gradually transferred to private actors. This paper analyses whether privatisation, as part of NPM reforms, has benefited the consumer. We have, therefore, compiled data on privatisation in the telecommunication sector for 15 European countries from 1980 to 2006. The data set covers the corporatisation process, as well as the transfer of the service provision to the private sector. Three empirical findings stand out: first, the reform processes have differed widely from each other. Second, it's not just the transfer of ownership to the private sector that has ensured efficiency gains and increased consumer benefits; corporatisation has done this as well. Third, efficiency gains have been transferred to the consumer, especially at the beginning of the reform process.

CONTENTS

New Public Management Reform in European Countries: The Retreat of the State from Telecommunication Services

1 INTRODUCTION

During recent decades, governments all over Europe have introduced new modes of governance (Lane 1997). Under the label of "New Public Management" (NPM), governments have modernised accountability and control, changed organisational structures and have introduced market-type mechanisms. Indeed, "public management reform consists of deliberate changes to the structure and processes of public sector organisations with the objective of getting them (in some sense) to run better" (Pollitt and Boueckaert 2004, p.8). One instrument used under the rubric of NPM is the privatisation of public enterprises (Lane 1997, p.593, 2000; Pollitt and Bouckaert, 2004; Pollitt et al. 2007).

The reform process in the public utilities sector has been placed under particular scrutiny. Traditionally it was the state that was responsible for supplying goods and services of general economic interest. In the meantime, governments all over the world have partly or completely privatised these sectors (OECD 2003), with the main objectives being to improve quality and reduce costs by increasing efficiency. In fact, the evidence shows that efficiency levels have increased due to privatisation and market liberalisation (Megginson and Netter 2001), and that public service delivery has been particularly affected (Pollitt and Bouckaert 2004).

We focus on the telecommunication sector because it has played a dominant role in past privatisation policies throughout OECD countries (OECD 2003). We further concentrate on Europe since telecommunication services here have traditionally been provided by public administrative bodies, and Europe has been "the continent most involved in the phenomenon" of privatisation (Bortolotti and Siniscalco 2004, p.2).

From a public choice perspective, privatisation policies are designed by self interested politicians considering the voters' preferences in order to win the next election. Since the consumers represent a significant constituency of voters we have chosen to evaluate the effect of the reforms on the consumer. We are particularly interested in how privatisation affects the interaction between the quantity, quality and price of telecommunication services. In order to address this question, we first developed a new indicator to measure the extent of public entrepreneurship and applied it to the telecommunications sector. The self-compiled database offers a unique opportunity to have a broad-based international comparison of privatisation across European countries, sectors and over time. We then established an index for consumer benefits which combines

indicators taken from the International Telecommunication Union Indicators Database for quantity, quality and price of telecommunication services (ITU 2007). We then carried out a study of 15 European countries for the period 1980 to 2006[1], which was explicitly aimed at overcoming the shortcomings in the empirical literature in the fields of NPM and economics.

The paper is organised as follows. Section II reviews the empirical literature of NPM and discusses its shortcomings, as well as the concepts and theories of privatisation and consumer benefits. Section III illustrates the measurement of our main independent variable and our dependent variable, in addition to providing descriptive results for both indicators. Section IV presents the regression results and section V provides a conclusion.

2   EFFECTS OF NPM REFORMS – THE CASE OF PRIVATISATION

2.1 Empirical Review

Privatisation has many different faces (OECD 2003; Megginson and Netter 2001; Daintith 1994). In the telecommunications sector, formal privatisation – a change in legal status to more commercially oriented organisational forms – and material privatisation – the divestment of public enterprises – have both played a decisive role (OECD 2005; Lane 2000). The effects of formal and material privatisation (as instruments of NPM) on network-based utilities are discussed in the literature in the fields of both NPM and economics.

The NPM-literature emphasises the changing influence of administrative and political actors, as well as the distinctive governance modes in traditional and modern forms of public administration accompanied by privatisation. Privatisation implies, among other things, the replacement of bureaucratic structures with commercial management and, thus, the liberation of administrative and economic processes from political decision-making (Pollitt and Bouckaert 2004; Thynne 1994; Lane 2000). Liberated contract managers, with term-based or performance-based contracts, are solely responsible for the interests of the company, as opposed to ministers or bureaucrats with political responsibilities. In a privately held company, the management and the employees have more incentives to run the commercial business efficiently (Thynne 1994). Accordingly, Pollitt and Bouckaert (2004) have developed an explanatory model for public management reform and compare different instruments of NPM in twelve OECD countries. They further relate them to different reform outputs and illustrate these relationships with empirical examples. Additionally, Lane (1997, 2000) provides a comparison of the

---

[1]   Italy is excluded from the sample due to data availability issues.

efficiency of different public enterprises from a theoretical perspective. Self-perception data of executives is employed in Meyers and Verhoest (2006) to test if different management instruments and organisational forms make a difference in terms of the self-assessed quality of services and products. They did not find a relationship between the organisational form and the perceived performance of public sector organisations.

With a particular focus on the consumer, the European Research Project PIQUE investigates the consequences of privatisation and liberalisation on employment, productivity and service quality in four sectors (electricity, postal services, healthcare and local transport) in six countries (Austria, Belgium, Germany, Poland, Sweden and the UK). By analysing primary and secondary data, they have drawn a diverse picture of the effects privatisation has on the consumer. They find that some quality aspects have improved while others have deteriorated. Furthermore, not all consumers have benefited from the restructuring processes. Privatisation and liberalisation only appear to improve the quality public services when combined with an adequate regulatory policy (PIQUE 2009; Flecker et al. 2008; Kilicaslan et al. 2008; Vael et al. 2008).

In addition to studies on public administration, several empirical studies in the economic literature analyse the effect of divestment (material privatisation) on the performance of (formerly) public enterprises. For instance, Bortolotti et al. (2002) examined the financial and operating performance of 31 telecommunication companies in 25 countries that were fully or partially privatised between 1981 and 1998. They found that the observed improvement mainly resulted from regulatory changes or in combination with privatisation, rather than from privatisation alone. Boylaud and Nicoletti (2000) and Ros (1999) used panel data to analyse the impact of privatisation on expanded teledensity, operating efficiency, as well as the quality and pricing of telecom services. Unfortunately, the results of privatisation in these studies were not conclusive. However, the studies agree that the combination of privatisation and liberalisation improve the efficiency of services.

D'Souza et al. (2005) state that privatisation itself has improved the profitability, efficiency, output and capital expenditure of divested firms in 23 OECD-countries. Moreover, in terms of the British and US telecommunications market, Kwoka (1993) finds that divestiture has had a positive effect on total factor productivity. However, McNary (2001) shows for the period 1987 to 1998 that privatisation had a negative impact on network penetration for about 200 countries when taking competition into account. A comprehensive overview on the effect of privatisation on efficiency is provided by Megginson and Netter (2001), who summarise existing empirical studies in the telecommunications sector. Most of the studies reviewed support the view that divestments have a positive effect on efficiency.

In sum, several conclusions can be drawn. First, the discussions in the literature in the domains of NPM and economics take place separately from each other, with the economic literature focusing on material privatisation as the disposal of public enterprises. Second, most empirical studies in the economic literature analyse the effects of privatisation on efficiency and not on consumer benefits. Third, the NPM literature focuses on restructuring processes in general, not explicitly considering material privatisation. The most apparent gap, however, persists in terms of quantitative international comparisons, where a systematic investigation of formal privatisation is completely missing. The NPM literature is dominated by conceptual work or case studies and quantitative research is strongly underrepresented.

2.2 Privatisation and Consumer Benefits: Concepts, Theory and Hypotheses

Formal privatisation is understood as a change in legal status to more commercially oriented organisational forms. It is not possible to sell shares and initiate material privatisation before the public enterprise in question has been formally privatised. Despite national differences, three forms of formal privatisation can be distinguished.

1) The first type of formal privatisation (I) refers to the transformation of a departmental agency (e.g., the Bundesanstalt für Post und Telekommunikation) into a public corporation (e.g., the Deutsche Bundespost) that is subject to special or public law. While a departmental agency does not have its own legal personality, a public corporation is an autonomous public body with its own legal status and a partly commercial structure. Although the objectives of a public corporation are often defined by law or statute, it has more autonomy in day-to-day operations than a departmental agency (Boes 1986).

2) The second type of formal privatisation (II) involves changing a public corporation into a state company that is subject to private law, such as a joint stock company (e.g., Deutsche Post AG). A state company is subject to the same rules as private companies. In contrast to public corporations or departmental agencies, state companies are only responsible for the well-being of the enterprise itself. The state, however, remains the unique stakeholder (Boes 1986).

3) The third type of formal privatisation (III) refers to the direct transformation of a departmental agency into a state company that is subject to private law.

Figure 1 (p. 5) illustrates the conceptualisation of formal and material privatisation. In the following we use this concept of privatisation as the framework for our analysis.

Given that markets function perfectly, public choice theory argues that government intervention leads to inefficient outcomes and, for that reason, private solutions are preferred (Mueller 2003). However, in network based utilities like telecommunication,

market failure has traditionally justified public intervention (Boes 1986). Yet, the belief that market failure can be solved by public ownership has recently been challenged. In particular economic theory argues that public ownership affects the maximisation problem of the firm in two ways. First, the objective function is distorted. In contrast to private actors, politicians, as representatives of the people, have to fulfill other objectives in addition to maximising profits, such as maximising total employment (Shleifer 1998; Boycko et al. 1996; Laffont and Tirole 1991, 1993; Shapiro and Willig 1990; Sappington and Stiglitz 1987). Thus, once a company has a private owner, fewer resources are spent on pursuing goals that do not relate specifically to profit maximisation. Second, public enterprises face a "soft budget" constraint which distorts their incentives to undertake reasonable investments or to manage operations cost-effectively. This is due to the fact that the government is often legally obligated to bail them out in case of losses or bankruptcy (Sheshinski and Lopez Calva 2003; Schmidt 1990).

Figure 1:   Conceptualisation of Privatisation
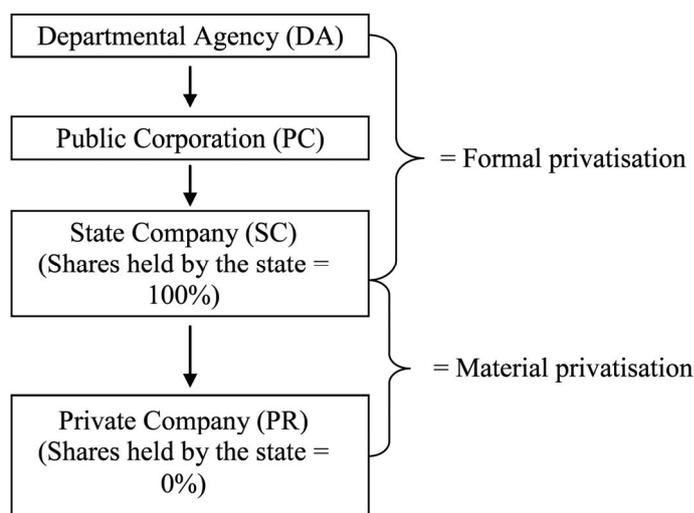
It is particularly the formal privatisation of public enterprises that changes budgetary arrangements as well as other corporate governance techniques. Accordingly, the economic literature stresses the importance of corporate governance techniques as an important tool in resolving agency problems and, thereby, increasing efficiency at the company level (Pagano and Volpin 2005; Coffee 1999; Shleifer and Vishny 1997). Moreover, changing the legal status of a public entity also affects its ability to raise funds externally (cf. OECD 2003, p.21). New capital is essential, especially in capital intensive industries like network-based utilities, in order to maintain the network, to access new markets, to invest in service delivery, and to invest in research and development (R&D) for the purposes of improving quality or creating new products (Noam 2004). Last but not least, fewer bureaucratic processes within the company facilitate adaptation to new situations (Munari et al. 2002; Karpoff 2001; Wright et al. 2000;

Zahra et al. 2000). By selling assets (material privatisation), the government greatly relinquishes control. Although, it often maintains control via golden shares or ultimate ownership (Bortolotti and Faccio 2008; OECD 2003), its overall influence decreases (Boubakri et al. 2005). Since profits are mainly owned by private shareholders, the incentives to work efficiently improve. The ownership structure is therefore important for efficiency (Short 1994). Nonetheless, the level of efficiency for the network based utilities depends not only on the ownership structure, but also on the market structure. For instance, a private monopoly does not necessarily operate more efficiently than a public one. Therefore, a competitive market is one important precondition for realising the full benefits of privatisation (Newberry 1997). The potential problem of market power abuse is indicated by empirical evidence which shows that in less competitive markets the operational efficiency is smaller whilst profitability goes up (Boubakri and Cosset 1997; D´Souza and Megginson 1998)

Whether or not efficiency gains translate into consumer benefits depends on the way in which the maximisation problem of the consumer is affected. In general, utility is determined by the quantity, price, and quality of goods and services as well as disposable income. The effect on the consumer depends on the trade-off between costs and benefits. Although we do not know the individual preferences that are necessary for deriving individual utility levels, overall we hypothesise that privatisation increases consumer benefits. Privatisation facilitates the investments necessary for expanding networks, which leads to an increase in supply and an increase in access to goods and services. In addition, more efficient production should result in lower prices and a better quality product.

3 PRIVATISATION AND CONSUMER BENEFITS: EMPIRICAL EVIDENCE FROM EUROPE

3.1 Measurement and Description of Privatisation

One of the central drawbacks of the existing empirical literature is the use of privatisation indicators, since none of these incorporate formal privatisation. A combination of formal and material privatisation measures is missing. Furthermore, material privatisation is measured mainly by summing up the proceeds from the sale, which is not the most accurate approach (Etling et al. 2009). This prevents a comprehensive picture of privatisation from being drawn. In contrast, we have developed an index that brings together the concepts of formal and material privatisation. The index relates economic output indicators (total revenues and number of employees) for the formally or materially privatised telecommunication provider to national economic reference indicators for each year and per country (gross national product (GNP) and sectoral employment)

and therefore provides internationally comparative data.[2] It therefore accurately measures the participation of the state in the national economy and in sectoral employment. Based on this information a completely new database containing data from all relevant public enterprises is generated.[3] The Index is calculated formally:

$$(1) \quad I_j = \frac{X_j^{DA} + \frac{3}{4} \cdot X_j^{PC} + \frac{1}{2} \cdot \sum_{i \in SC_j} X_{ij}^{SC} \cdot s_{ij}^{SC}}{X_j}$$

n_j enterprises in sector j, i_j=1,…,n_j enterprises
E set of 3 types of enterprises: E={DA,PC,SC} where
DA: set of departmental agencies
PC: set of public corporations
SC: set of state companies
X^k: joint output (number of employees and total revenues) of all enterprises of type k in E
X: Sector-j-specific joint output of all enterprises of type k in E
X^k_ji: single firm output in j of type k in E
s^k_ij: relative share of publicly held shares of firm i in j of k in E (only if applicable(*))
where:
s^DA_ij=s^PC_ij=1 for all ij (*)

The index identifies the type of organisational form (*DA, PC, SC*) and the percentage of shares owned by the government (*s*) on an annual basis, and combines this information with the respective outputs of the given year (*X*).[4] Formal and material privatisation is weighted equally, whereas formal privatisation is subdivided into two different types. If more than one publicly owned firm operates in the sector, then the index sums the weighted outputs over all firms. The weighted outputs are finally set in reference to an overall measure of output, i.e., GNP or total sectoral employment.[5] Once a firm becomes completely privately owned (s=0), it drops out of the index. The index therefore measures the part of the total economic output (sectoral employment) in the telecoms sector provided (employed) by the state.

To illustrate the national privatisation paths, the following figures show the development of the state's entrepreneurial activities in the telecommunications sector. The horizontal axis illustrates the year of observation, while the vertical axis displays the index value of the state's entrepreneurial activities. The graphs on the left-hand side illustrate the total revenues provided by the state in relation to gross national product in US-Dollars, while the graphs on the right-hand side indicate the number of employees

---

[2] To compile this database, information from national governments, regulatory agencies, national laws, and public enterprises was collected, compiled and analysed. The index is also developed for other sectors and for each national economy.

[3] Missing values with regard to the number of employees were estimated using the trend of the national sectoral employment. With regard to total revenues, missing values were estimated in accordance with the development of GNP, since no sectoral data exists. If no data was available at all, missing values were assumed to be constant.

[4] Qualitative data for our sample of companies is displayed in Table A1

[5] GNP data as a reference is taken since GDP data does not include international revenues. Since the revenues from each company include sales from international transactions, GDP is an inaccurate reference.

in state-owned enterprises in relation to total employment in the telecommunication and postal sector.[6]

Figure 2:   Public Entrepreneurship in the Telecommunications Sector 1980 - 2006

Germany (solid) Austria (dash) Switzerland (dot)
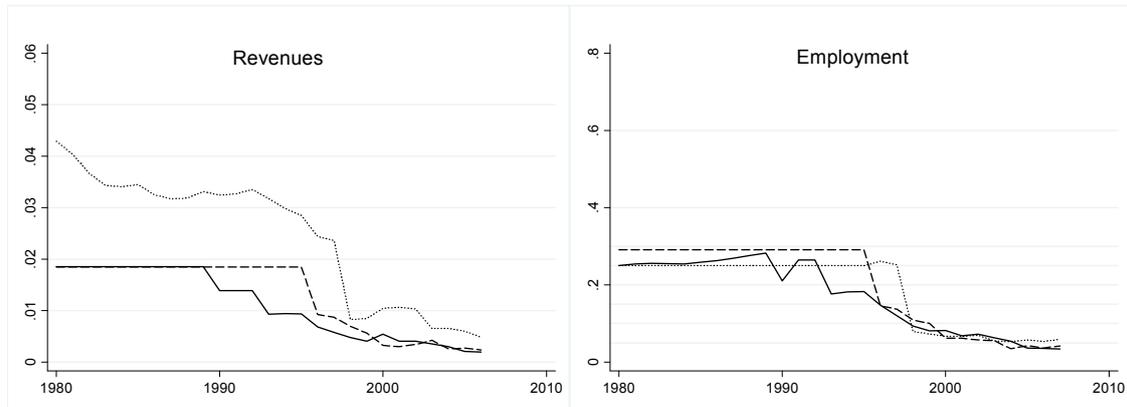
Denmark (solid) Sweden (dash) Finland (dot) Norway (dash-dot)
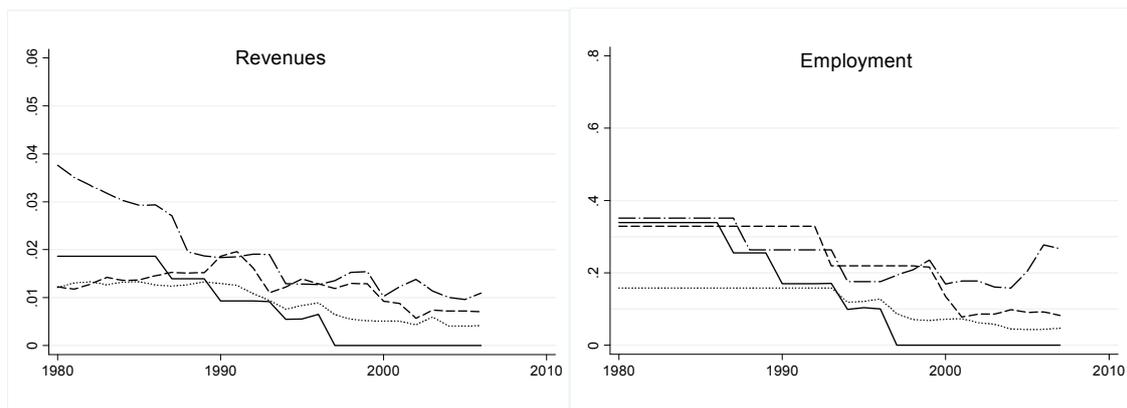
Belgium (solid) The Netherlands (dash) France (dot)

---

[6]   To avoid visual confusion the sample is divided into several historical and geographically-based families of nations.

Greece (solid) Spain (dash) Portugal (dot)
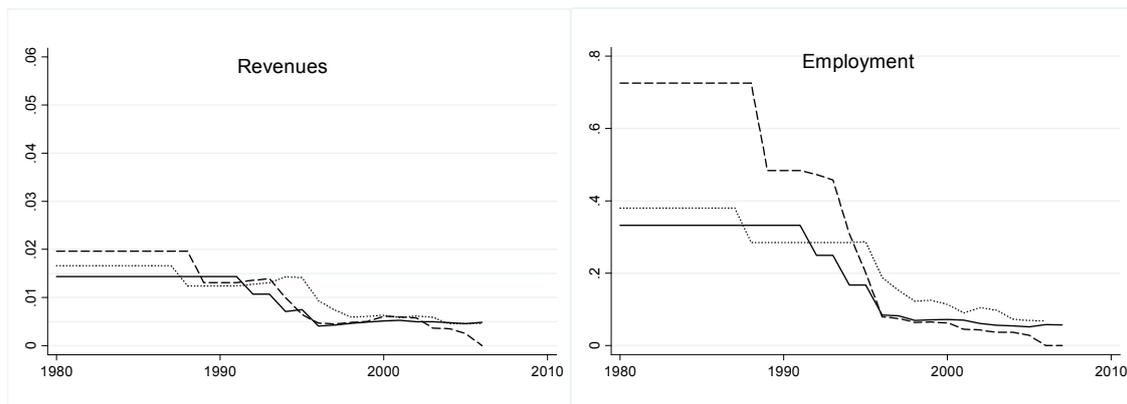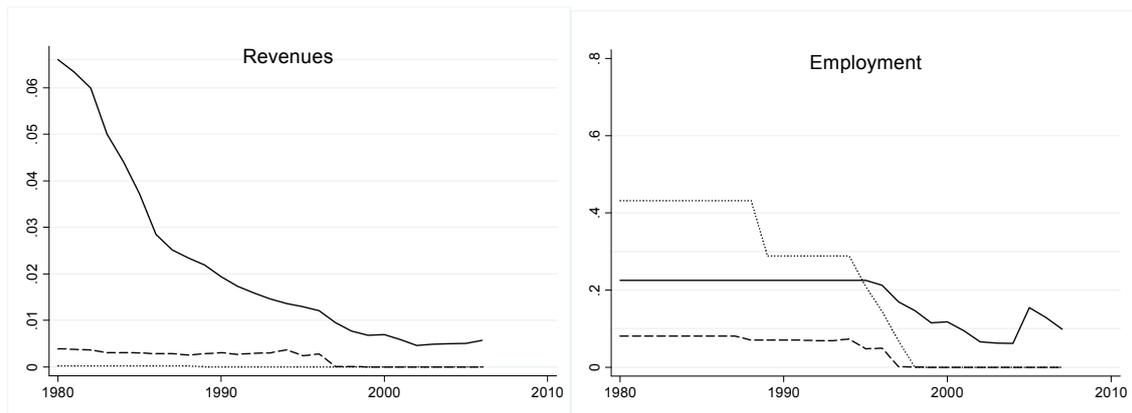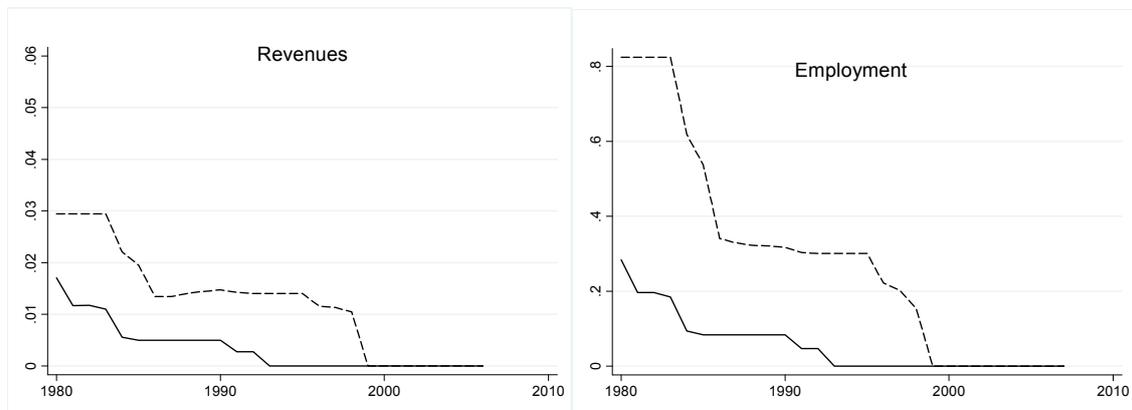

UK (solid) Ireland (dash)

Figure 2 reveals several interesting facts. First, the European countries vary strongly with regard to their point of departure in 1980. In the Netherlands, for instance, more than 70% of the sectoral employment (post office + telecoms) was accounted for by the public telecommunication provider. In Ireland more than 80% of the sectoral labour force was employed in a departmental agency. In contrast, in other countries, such as Spain, only about 10% of sectoral employment was accounted for by the public tele-communication provider. The same holds true for the total revenues. In 1980, entrepre-neurial state activities formed a relatively large part of gross national product in some countries (in Greece >8% and about 4% in Switzerland), while much less in others (less than 1% in Spain). Second, in addition to the different initial situations, the privatisation trajectories of the European countries examined also demonstrate remarkable differ-ences. In the German speaking countries, the level of state entrepreneurial activities remained constant from 1980 to 1990, when the formal privatisation process started. Moreover, in these countries, the state only retreated moderately from entrepreneurial activities. In contrast, Ireland and Spain restructured their telecommunications sectors very quickly and have radically privatised their national telecommunication providers. Others started the privatisation process early, such as the Scandinavian countries,

though the reform process has been characterised by many reform steps. It is interesting to note that although the starting positions of the countries and their subsequent privatisation paths have differed greatly, they have now almost converged with regard to the extent of state entrepreneurial activity. This observation gives rise to the question of how to evaluate this development. In the following section we examine the impact of NPM reforms on the consumer and then conclude whether the reforms were beneficial or not.

3.2 Measurement and Description of Consumer Benefits

All of our telecommunication indicators are taken from the ITU Telecommunication Indicators Database (2007). Our composed indicator includes four indicators, i.e., two quantity indicators, one cost indicator and one indicator for quality. According to our argument, the utility of the consumer is affected by more than one dimension. Therefore, we focus on a combined measurement of consumer benefits. In order to measure the coverage and the network development we looked at the number of main fixed lines (*FIX*) and mobile subscriptions (*MOBILE*) per 100 inhabitants. We then merged *MOBILE* and *FIX* into one indicator for coverage (*COVERAGE*). A combination of both is necessary to avoid a structural bias. Some countries have developed faster in the mobile sector than others, sometimes to compensate for a lack of investment in network expansion for the fixed-line sector (Calabrese et al. 2002). Only looking at the fixed-line market would paint an incomplete picture. The dimension of price is approximated by the indicator for monthly subscription fees for a fixed line (*COSTS*).[7] Finally, we included a quality measure which is the percentage of digital lines (*QUALITY*). This indicator approximates the quality dimension, since new services are provided when digital lines are available. These include conference calls, faster dial-ups, call waiting, faster internet connections and Caller ID.[8] The interaction of all indicators taken together is one possible way to approximate the overall consumer benefits. Each indicator that enters the index for consumer benefits (*CONSUMER*) was continuous and normalised from 0 to 1. For normalization, we took the highest and the lowest value of the sample as the benchmark and, thus, constructed an index that ranges from 0 to 1. *COSTS* are rescaled so that low values indicate high prices. Formally:

---

[7] Unit prices for fixed and mobile lines, as well as monthly subscription costs for mobile lines contain too many missing values for our time period, meaning that their inclusion would lead to more gaps in information than information gained.

[8] Other indicators from the database such as "waiting lists for fixed lines" or "faults cleared by next day" are also interesting but the amount of missing values is not acceptable for our purposes, either.

$$(2) \quad CONSUMER_{it} = \frac{\sum COVERAGE_{it} + COSTS_{it} + QUALITY_{it}}{3}$$

It covers different dimensions and, thus, enables a more differentiated picture of consumer benefits than a mere analysis of pure output.[9] The correlation matrix indicates that the three indicators measure a latent dimension, which has also been confirmed by a rotated principal component analysis. Therefore it is appropriate to sum up the indicators in an additive index.

Figure 3 shows the average development of the three dimensions *COSTS, COVERAGE, QUALITY* as well as the overall consumer benefits (*CONSUMER*) for our entire sample.[10] The horizontal axis displays the yearly averages of the different indicators. The vertical axis illustrates the development over time.

Figure 3:   Consumer Benefits for 16 European Countries 1990 - 2005

CONSUMER (solid) COVERAGE (dash) COSTS (dot) QUALITY (dash-dot)
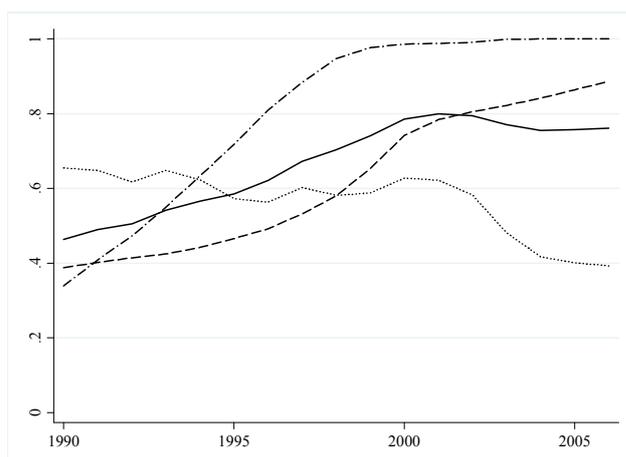
It is obvious that overall consumer benefits increase over time. However, the development of the different indicators is not simultaneous. While quality and quantity clearly show an upward development, costs have increased moderately over time. Nonetheless, the increase in costs has not outweighed the positive effects of increased quantity and quality. Figure 4 (p. 12) shows the development of consumer benefits for each country.

Although the overall development of consumer benefits display similarities, differences remain between countries. In some countries, such as France and Spain, the slope of consumer benefits is very moderate, while other countries—such as Germany, Switzerland and Greece–display a fast increase in consumer benefits over time. Second, the

---

[9]   The eigenvalue is 2.37 and the identified factor explains 59.25 per cent of the overall variance.

[10]   The ITU database covers data for telecommunication services mainly from 1990 onwards.

initial level is very different. This gives rise to the question of how different privatisation policies impact this development.

Figure 4: Consumer Benefits by Country 1990 - 2006
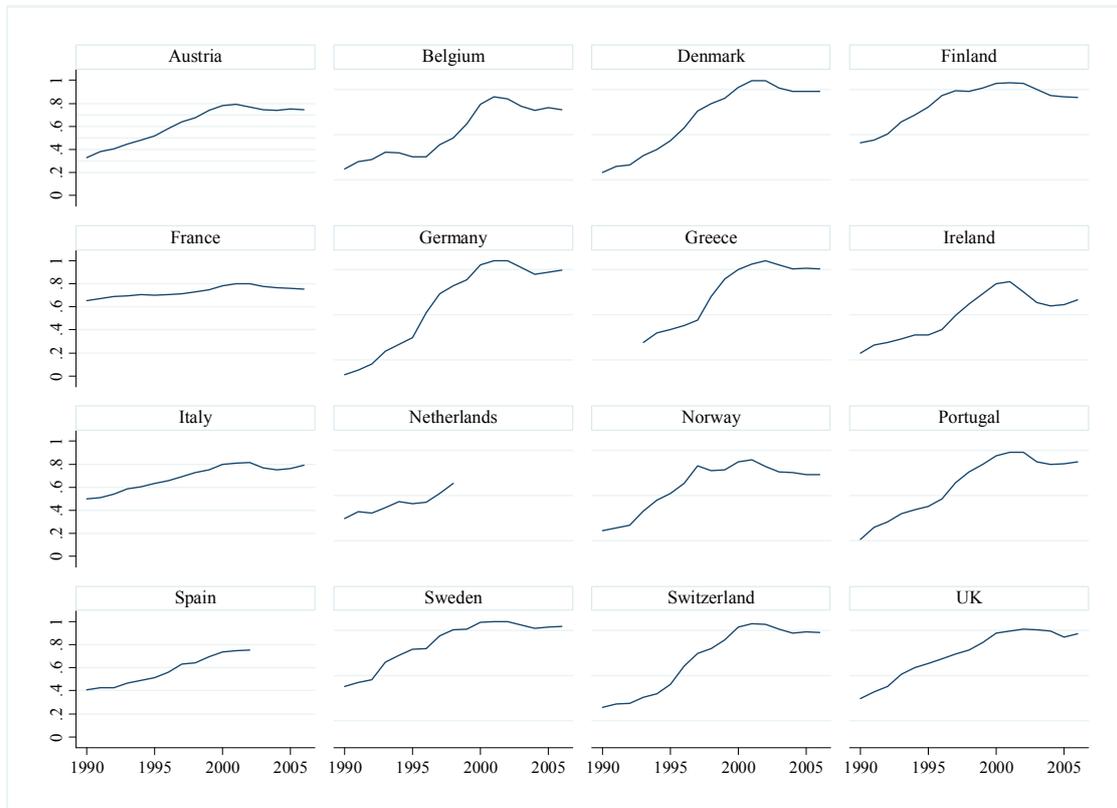
4 REGRESSION

In an effort to evaluate the effects of privatisation, we use our index of public entrepreneurship as the main independent variable.[11] In order to be certain about the effect of privatisation, we control for additional explanatory factors. First of all, the newly privatised firm's performance is affected by the competitive environment. The issue of whether ownership or competition matters is widely discussed in the literature (e.g., Villalonga 2000; Ros 1999). The indicator used is the market share of new entrants (*COMP*) which is taken from the OECD regulatory database (Conway and Nicoletti 2006). A high degree of market concentration negatively affects consumers, since prices are above the competitive level. Furthermore, we account for capital market development. Investments in network expansions or R&D activities depend on the possibility of

---

[11]   Within the regression, we only employ the index for the total revenues and not for the number of employees because estimated results for both indices do not differ significantly. In order to avoid redundancy we skip the employee index for our estimation.

raising new funds to finance these activities (Noam 2004). Low capital market development, high interest rates and unstable financial environments negatively affect supply (Demirgüc-Kunt and Maksimovic 1998), which might negatively affect the consumer (Noam 2004). The data employed is the MSCI Index from Standard and Poor's, which measures market capitalisation and liquidity, and, thus, captures the capital market development.[12] We also argue that disposable income influences personal utility levels and, thus, GDP per capita (*GDP*) is included in order to control for different levels of economic well-being. The level of income influences the demand for quantity and quality. This, in turn, affects the possibilities that are available to the company.

In the context of network-based utilities, technological progress plays an important role, especially by offering possibilities to overcome bottlenecks that inhibit competition. The emergence of the internet has been a very important milestone for the telecommunications sector in particular (Lien and Peng 2001). According to Lien and Peng (2001), 1995 is seen as the year that the internet was introduced, which was when "telecommunications transferred from a circuit-switch to a package-switch system" (p.61). We use a period dummy 1995 to 1997 to capture the lagged and non-immediate effects of this technological breaking point.[13] We expect a positive influence on consumer benefits.

Some authors have argued that population density plays an important role in network-based utilities (McNary 2001), since investments in networks and maintaining these networks is more profitable with higher population densities. Unit costs are lower, the more intensively the network is used. Consumer benefits are more likely to occur the higher the population density is (*POP*). The population density data is taken from EUROSTAT.

Last, but not least, we control for the initial level of public entrepreneurship in 1980, labeled *REVENUE_1980*. We assume that the initial size will influence the dynamics of the reformed market. Specifically, we believe that the lower the initial level of public entrepreneurship the sooner efficiency gains will be realized and the more likely it will be for the consumer to benefit.

We performed different kinds of statistical analyses using our sample. The Hausman-Test (Hausman 1978) indicated the existence of unobserved heterogeneity. The literature suggests using first difference or fixed effect models (Wooldridge 2002). Since we were interested in the influence of changes in the entrepreneurial activities of the state

---

[12] Note that a similar Index was taken for Greece, the IFCI Index Greece.

[13] Since there are other ways to control for technological progress, we checked for robustness by including other period and year dummies for the introduction of the internet and the GDP growth as a proxy. The results did not change substantially.

with regard to consumer benefits, two first difference models (FD) were applied (Model II and IV). In order to examine the level effects as well, two fixed effects models (FE) were employed (Model I and III).[14] Unfortunately, fixed effect models do not allow for the estimation of time invariant variables and make the estimation of the effect of rarely changing variables inefficient. To enable the integration of population density and the initial level of entrepreneurship in our estimation, we additionally applied a fixed effects vector decomposition model (FEVD) (Model V and VI). In a fixed effects vector decomposition model, the unit effect is first estimated by running an ordinary fixed effect model. The unit effect was then split into an explained and an unexplained part and the unit effects were regressed on the time-invariant and rarely changing explanatory variables. Third, a pooled OLS was estimated by including all explanatory variables and the unexplained part of the fixed effect vector (Plümper and Tröger 2007).[15] Since a delayed effect of the reform on consumer benefits is plausible, Model III and IV include a one year lag variable for the central independent variable *L1_REVENUE*.

When analysing panel data, several pitfalls exist and certain restrictions have to be considered. We therefore tested for the existence of autocorrelation in the residuals, mutlicollinearity, non-stationarity and heteroscedasticity. In order to test for autocorrelation, the residuals were regressed within a simple auxiliary OLS regression on all independent variables, including the delayed residuals. Additionally, we performed the Wooldridge Test for first order autocorrelation (Wooldridge 2002). For that reason the fixed effect and fixed effect vector decomposition models were estimated with autoregressive disturbances. We also performed an augmented Dickey Fuller test to check for stationarity. The null hypothesis of non-stationarity was rejected for *CONSUMER*. Multicollinearity was checked with pair-wise correlations of the independent variables, which do not indicate severe problems in any of the model specifications. To test for heteroscedasticity, we performed the White test using squared residuals as the dependent variable of an auxiliary regression. We dealt with heteroscedasticity by estimating the first difference and fixed effect models with robust standard errors. Table 1 includes the results of the panel data estimations.

---

[14]   Both models lead to a consistent estimator in the presence of unobserved heterogeneity.

[15]   The Hausman Taylor estimator is only efficient when using appropriate instruments which have to be uncorrelated with the time-invariant and time-variant variables. Without appropriate instruments at hand, the fixed effects vector decomposition performs better than Hausman Taylor estimator (Plümper/Tröger 2007).

Table 1: Regression Results

Independent Variable	(I) First Difference	(II) Fixed Effect (AR1)	(III) First Difference	(IV) Fixed Effect (AR1)	(V) Fixed Effect Vector Decomposition (AR1)	(VI) Fixed Effect Vector Decomposition (AR1)
REVENUE	-2.563 (.950)**	-4.818 (.974)***	-	-	-3.562 (.482)***	-4.468 (.479)***
L1_REVENUE	-	-	2.781 (.871)**	-4.729 (1.149)***	-	-
REVENUE1980	-	-	-	-	.567 (.146)***	.555 (.147)***
GDP	-2.51e-06 (1.56e-06)	1.91e-06 (1.27e-06)	-2.80e-06 (1.59e-06)	1.48e-06 (1.13e-06)	1.01e-06 (3.79e-07)**	9.03e-07 (3.79e-07)*
MSCI	9.74e-06 (3.92e-06)*	1.06e-05 (4.98e-06)*	9.06e-06 (3.27e-06)**	1.03e-05 (3.59e-06)**	1.15e-05 (2.20e-06)***	1.14e-05 (2.18e-06)***
COMP	.051 (.016)**	.112 (.009)***	.056 (.013)***	.108 (.015)***	.109 (.006)***	.096 (.007)***
REV_COMP	-	-	-	-	-	2.90 (.805)***
INTERNET	-	.003 (.010)	-	.001 (.012)	.005 (.005)	.005 (.005)
POP	-	4.33 e-05 (1.3e-04)	-	-8.88e-05 (6.76e-05)	-5.75e-05 (1.45e-05)***	-4.86e-05 (1.47e-05)***
N	207	210	219	218	193	193
F	6.47***	-	9.06***	-	-	-
R2	.113	.747***	.121	.743***	.599***	.616***

Notes: Regression coefficients with standard errors in brackets; The Fixed Effects models with AR(1) disturbances include panel-corrected standard errors; First Difference models include robust standard errors, Notes: *$p,z<0.05$, **$p,z<0.01$, ***$p,z<0.001$

In the first specification, we controlled for competition, stock market development and GDP per capita. In this model, our privatisation variable is significant at the 1%-level. The results confirm our theoretical assumption that New Public Management reforms lead to an increase in consumer benefits. The same holds true for increasing competition and favourable stock market developments, which are both highly significant. Model II integrates a dummy year for the introduction of the internet in a panel fixed effects model with autoregressive disturbances (AR(1)). Our main independent variable again turns out to be highly significant. As in model I, the effect of competition is highly significant as well. The next two models (III + IV) indicate the delayed effect of privatisation. The effect of *L1_REVENUE* turned out to be similar to that of *REVENUE*. In both of these models, the reform processes increase consumer benefits significantly. The faster the state reduced its weight in the telecommunication sector, the more the consumer benefits. Nonetheless, for Model I through IV the internet dummy turns out to be insignificant. We also tested GDP growth as a proxy for technological progress; however, the results are similar and insignificant. For Model I through IV, the stock market variable is highly significant, which is consistent with the theoretical predictions.

The last two regressions (V and VI) were estimated with a fixed effect vector decomposition model. Model VI additionally includes an interaction term between privatisation and competition (*REV_COMP*). With the interaction term, we tested whether NPM reforms individually affect consumer benefits or if the effect is only felt in combination with a competitive environment. It was found that the estimated coefficient of the interaction variable is highly significant. This means that the effect of privatisation on consumer benefits is particularly strong when the level of competition is low; however, as soon as a competitive environment develops, the influence of privatisation is diminished and vice versa. Nonetheless, the interaction shows that each variable on its own is significant, thus stressing the relevance of privatisation. Additionally, the fixed effect vector decomposition models enable us to include important time-invariant variables.[16] These variables are the initial public sector size at the beginning of our observation period in 1980 and population density. The results reveal some remarkable aspects. The effect of the population density is negative and highly significant. This contradicts the theoretical prediction that the transfer of efficiency gains to the consumer is more likely with a higher population density. Regarding New Public Management Reforms, our index is highly significant with a negative sign. The faster the state retreats, the more the consumer benefits. However, the initial size of the public sector has a positive sign. We interpret this as follows: the higher the initial size, the higher the potential for efficiency gains and, hence, the more the consumer can benefit from a reform. If the tele-

---

[16] This approach is also suitable since cross country variance is for some variables higher than within variance.

communication provider has not yet formally been privatised, our index has high values. The positive sign of the initial level of public sector ownership, which essentially represent the time period before formal restructuring, implies that a high marginal effect takes place during the time of the restructuring, rather than during the divestment period. Formal privatisation, therefore, particularly frees up the potential of consumer benefits. Furthermore, GDP per capita turns out to be significant, although with a small effect.[17] For models V and VI, the stock market variable is highly significant, thus stressing the importance of external finance and favourable market conditions.

In sum, our hypothesis is largely confirmed over all specific models. Privatisation by itself has a significant positive impact on the consumer, although the regulatory environment plays a decisive role as well.

5   CONCLUSION

This paper analyses the effect of privatisation reforms on consumer benefits as a central New Public Management instrument in the telecommunications sector. For this purpose, we have presented a new self-compiled database of public entrepreneurship in the telecommunications sectors of 15 European countries during the period 1980 to 2006. The desire to develop a new indicator stems from the fact that for international comparisons, quantitative empirical studies merely consider the material dimension of privatisation and inaccurately measure this phenomenon. Our new indicator, the index of public entrepreneurship, offers a unique opportunity to comprehensively depict privatisation by integrating formal privatisation – a change in legal status to more market-oriented organisational forms – and material privatisation – the divestment of public enterprises.

First, we presented descriptive results for the given privatisations and consumer benefits. The data show clear convergence trends, although countries differ greatly in timing, initial magnitude and the dynamics of the reform process. Moreover, consumer benefits have increased in all countries, although not to the same extent. Our study poses the question of whether these increases in consumer benefits are caused by privatisation policies.

To analyse our research question, several panel data techniques were applied. The estimations reveal remarkable results. First, the research literature often argues that privatisation only has a positive impact on consumer benefits in combination with a competitive environment. Our results demonstrate that the opposite holds true. Privatisation is particularly important when the competitive environment is restrictive. Apart from this, we find that privatisation brings about consumer benefits on its own. Second, in contrast

---

[17]   This is mainly due to the fact that the Fixed Effect Vector Decomposition Model is particularly suitable for estimating the effect of rarely changing and time invariant variables.

to the economic literature, which stresses the effect of material privatisation on efficiency, we show that formal privatisation is an important instrument in increasing benefits for the consumer. Formally privatised companies normally operate in a monopolistic environment. The high influence privatisation has in non-competitive environments, in particular, confirms the importance of formal privatisation. Third, consumer benefits emerge above all at the beginning of the reform process. The lower the level of state participation, the lower the marginal consumer benefits when the state further reduces its participation.

In sum, our results strongly confirm that privatisation has a significant impact, and that it has, in particular, benefited the consumer in Europe.

REFERENCES

Boes, D. (1986). Public Enterprise Economics: Theory and Application. Amsterdam: North Holland.

Bortolotti, B. & Faccio, M. (2008). Government Control of Privatized Firms. Review of Financial Studies, 1, 1-33.

Bortolotti, B., D'Souza, J., Fantini, M., and Megginson, W.L. (2002). Privatization and the Sources of Performance Improvement in the Global Telecommunication Industry. Telecommunications Policy, 26, 243-268.

Bortolotti, B. & Siniscalco, D. (2004). The Challenges of Privatization: An International Analysis. Oxford: Oxford University Press.

Boubakri, N., Cosset, J.C., Guedhami, O. (2005). Postprivatization corporate governance: The Role of ownership structure and investor protection. Journal of Financial Economics, 76, 369-399.

Bourbakri, N. & Cosset, J.C. (1997). The Financial and Operating Performance of Newly Privatized Firms: Evidence from Developing Countries. The Journal of Finance 53, 1081–1110.

Boycko, M., Vishny, R.W., Shleifer, A. (1996). A Theory of Privatisation. Economic Journal, 106, 309-319.

Boylaud, O. & Nicoletti, N. (2000). Regulation, Market Structure and Performance in Telecommunications. Economics Department Working Paper No. 237, Paris: OECD.

Calabrese, A., Campisi, D., Mancuso, P. (2002). Productivity Change in the Telecommunications Industries of 13 OECD countries. International Journal of Business and Economics, 3, 209-223.

Coffee, J. C. Jr (1999). Privatization and Corporate Governance: Lessons from Securities Market Failure. Columbia Law School Working Paper No. 158.

Conway, P. & Nicoletti, G. (2006): Product Market Regulation in Non-Manufacturing Sectors in OECD Countries: Measurement and Highlights. OECD Economics Department Working Paper, Paris.

Daintith, T. (1994). The Legal Techniques of Privatisation. In T. Clarke (Ed.), International Privatisation: Strategies and Practices (pp. 43-77). Berlin: Walter de Gruyter.

D'Souza, J., Megginson, W., Nash, R. (2005). Effect of institutional and form specific characteristics on post-privatization performance. Journal of Corporate Finance, 11, 747-766.

D'Souza, J. and W. Megginson (1998). The Financial and Operating Performance of Privatized Firms During the 1990's. mimeo. Department of Finance, Terry College of Business, The University of Georgis, Athens, GA.

Demirgüc-Kunt, A. & Maksimovic, V. (1998). Law, Finance and Firm Gowth. Journal of Finance, 53, 2107-2137.

Flecker, J., Hermann, C., Brandt, T., Böhlke, N., Thörnqvist, C. (2008). Liberalisation and privatisation of public services – company reactions. Vienna: PIQUE.

Hausman, J.A. (1978). Specification Tests in Econometrics. Econometrics, 46, 1251-1271

ITU (2007). World Telecommunication/ICT Indicators Database. Geneva: ITU.

Karpoff, J.M. (2001). Public versus Private Initiative in Artic Exploration: The Effects of Incentives and Organizational Structure. The Journal of Political Economy, 109, 38-78.

Kilicaslan, Y., Pond, R., Tasiran, A. C. (2008). Liberalisation and Privatisation of Public Services and the Impact on Productivity. London: PIQUE.

Kwoka, J. E. (1993). The Effects of Divestiture, Privatization, and Competition on Productivity in U.S. and U.K. Telecommunications. Review of Industrial Organization, 8, 49-61.

Laffont, J.J., & Tirole, J. (1991). Privatization and Incentives. Journal of Law, Economics and Organization, 7, 84-105.

Laffont, J.J., and Tirole, J. (1993). A Theory of Incentives in Procurement and Regulation. Cambridge: MIT Press.

Lane, J.-E. (1997). Why Public Joint Stock Companies? In K. Koenig & A. Benz (Ed.), Privatisierung und staatliche Regulierung. Bahn, Post und Telekommunikation, Rundfunk (pp. 592-605). Baden-Baden: Nomos.

Lane, J.-E. (2000). New Public Management. London: Sage.

Lien, D. & Peng, Y. (2001). Competition and production efficiency Telecommunications in OECD countries. Information Economics and Policy, 13, 51-76.

McNary, R. (2001). The Network Penetration Effects of Telecommunications Privatization and Competition. Public Policy, 58, 222-235.

Megginson, W. L. & Netter, J. M. (2001). From State to Market: A Survey of Empirical Studies on Privatization. Journal of Economic Literature, 39, 321-389.

Meyers F, & Verhoest, K. (2006). Performance of public sector organizations: do management instruments matter? 'A Performing Public Sector: The Second transatlantic Dialogue (2TAD)'. http://soc.kuleuven.be/io/ pubpdf/IO02060022v_politicologenetmaal2006.pdf. Accessed 29 July 2009.

Mueller, Dennis (2003). Public Choice. Cambridge: Cambridge University Press.

Munari, F., Roberts, E.B., Sobrero, M. (2002). Privatization processes and the redefinition of corporate R&D boundaries. Research Policy, 31, 31-53.

Noam, E. (2004). Telecommunications: from utility to volatility. Utilities Policy, 12, 1-4.

Etling, A., Mause, K., Obinger, H., Schmitt, C., Schreeb, K., Schuster, P. Traub, S. (2009). The Retreat of the State From Entrepreneurial Activities: An Integrative Survey. TransState Working Papers No. 107.

OECD (2003). Privatising State-Owned Enterprises: An Overview of Policies and Practices in OECD Countries. Paris: OECD.

OECD (2005). Modernising government. Paris: OECD.

Pagano, M. & Volpin, P.F. (2005). The Political Economy of Corporate Governance. The American Economic Review, 95, 1005-1030.

PIQUE (2009). Privatisation of Public services and the Impact on Quality, Employment and Productivity. Summary Report. Vienna: PIQUE.

Plümper, T. & Troeger, V. (2007). Efficient Estimation of Time-Invariant and Rarely Changing Variables in Finite Sample Panel Analyses with Unit Fixed Effects. Political Analysis, 15, 124-139.

Pollitt, C., & Bouckaert, G. (2004). Public Management Reform. A Comparative Analysis. Oxford: Oxford University Press.

Pollitt, C., Thiel, S.V., Homburg, V.M.F. (2007). The New Public Management in Europe: Adaption and Alternatives. Basingstoke: Palgrave.

Ros, A. (1999). Does Ownership or Competition Matter? The Effects of Telecommunications Reform on Network Expansion and Efficiency. Journal of Regulatory Economics, 15, 65-92.

Sappington, D.E. & Stiglitz, J. (1987). Privatization, Information, and Incentives. Journal of Policy Analysis and Management, 6, 567-582.

Schmidt, K. (1990). The Costs and Benefits of Privatization: An Incomplete Contracting Approach. Discussion Paper No. A-287. University of Bonn: Bonn.

Shapiro, C. & Willig, R. (1990). Economic Rationales for the Scope of Privatization. In E.N. Suleiman, & J. Waterbury (Eds.), The Political Economy of Public Sector Reform and Privatization. Westview Press: San Francisco, CA.

Sheshinski, E. & López-Calva, L. F. (2003). Privatization and its Benefits: Theory and Evidence. CESifo Economic Studies, 49, 429-459.

Shleifer, A. (1998). State versus Private Ownership. Journal of Economic Perspectives, 12, 133-150.

Shleifer, A. & Vishny, R.W. (1997). A Survey of Corporate Governance. The Journal of Finance, 52, 737-783.

Short, H. (1994). Ownership, Control Financial Structure and the Performance of Firms. Journal of Economic Surveys, 8, 203-249.

Thynne, I. (1994). The Incorporated Company as an Instrument of Government: A Quest for Comparative Understanding. Governance, 7, 59-82.

Vael, T., Vandekerckhove, S., Gyes, G. V., Roosbroek, S. V., Verhoest, K., Coppin, L. (2008). Liberalisation in services of general economic interest. A bottom up citizens' perspective. Analysis of the PIQUE Survey. Leuven: PIQUE.

Villalonga, B. (2000). Privatization and efficiency, differentiating ownership effects from political, organizational, and dynamic effects. Journal of Economic Behavior & Organization, 42, 43-74.

Wooldridge, J.M. (2002). Econometric Analysis of Cross Section and Panel Data. Cambridge: MIT Press.

Wright, M., Hoskisson, R.E., Busenitz, L.W., Dial, J. (2000). Entrepreneurial Growth through Privatization: The Upside of Management Buyouts. The Academy of Management Review, 25, 591-601.

Zahra, S.A., Ireland, R.D., Gitierrez, I., Hitt, M.A. (2000). Privatization and Entrepreneurial Transformation: Emerging Issues and a Future Research Agenda. The Academy of Management Review, 25, 509-524.

APPENDIX

Table A1: Qualitative Data for the Sample

Company Name	Type of Enterprise	Year Founded	Type of Formal Privatisation*	Public Ownership	Public Ownership before First Sale	Material Privatisation (Year of Sale and % of capital sold by the state)	Country
Telekom Austria AG	Private Company	1887	1996: III	25.2%	100%	1997: 5.7%, 1998: 19.4%, 2000: 27.2%, 2004: 17.6%, 2006: 4.9%	Austria
Belgacom	State Company		1992: I, 1994: II	51%	100%	1996: 49%	Belgium
Danske Telecom A/S	Private Company	1999	-	0%	22%	2004: 22%	Denmark
Tele Danmark A/S	Private Company	1927	1987: I , 1990: II	0%	100%	1993: 4%, 1994: 40%, 1997: 56 %	Denmark
Sonera Corporation	-	1917	1994: I, 1997: II	-	100%	1998: 22.2%, 1999: 19.9%, 2000: 3.1%, 2002: 64.8	Finland
Suomen Erillisverkot Oy	State Company	1999	-	100%	0%	2002: 60%, 2005: 40%	Finland
Turun Asennuspaja Oy	Private Company		-	0%	100%	1991: 100%	Finland
Telia Sonera AB (FIN)	Private Company	2002	-	13.7%	19.36%	2003: 0.29%, 2004: 5.34%, 2005: 0.03%	Finland
France Telekom	Private Company	1889	1988: I, 1996: II	27%	100%	1996: 21 %, 1998: 17 %, 2000: 6.9 %, 2001: 14.02 %, 2004: 8.63 %, 2007: 5.11 %, 2008: 0.69 %	France
Telekom AG	Private Company	1995	1990: I, 1995: II	14.83%	100%	1996: 26.0% 1997: 13.6%, 1998: 11%, 1999: 6.22%, 2000: 0.35%, 2001: 11.91%, 2002: 0.17%, 2003: 4.72%, 2004: 3.29, 2005: 7.34%, 2006: 0.57%	Germany
Hellenics Tele-communcations Organisations (OTE)	Private Company		-	25%	100%	1996: 5.7%, 1997: 19,2%; 1998: 10.1 %, 1999: 14%, 2000: - 1.44 %, 2001: 10.44 %, 2002: 8.3 %, 2004: -0.91 %, 2005: -1.02 %, 2006: -3.07 %, 2007: 10.7%, 2008: 3%	Greece

Company Name	Type of Enterprise	Year Founded	Type of Formal Privatisation*	Public Owner-ship	Public Own-ership before First Sale	Material Privatisation (Year of Sale and % of capital sold by the state)	Country
Eircom	Private Company		1984: I, 1986: II	0%	100%	1996: 20%, 1999: 80%	Ireland
Koninklijke PTT Nederland (KPN)	Private Company	1852	1989: II	0 %	100 %	1994 30%, 1995 25%, 2000: 5%, 2003: 12%, 2005: 6%, 2006: 22%	Nether-lands
Telenor ASA	SC	1855	1988: I, 1994: II	53.97%	100%	2000:22.3 %, 2003: 15.6%, 2004:8.1%	Norway
Portugal Telecom	Private Company	1968	1970: I, 1989: II	0%	100%	1995: 27.26%, 1996: 21.74%, 1997: 26%, 1999: 13.5%, 2000: 11.5	Portugal
Retevision 98	Private Company	1989	1996: II	0%	100%	2000: 100%	Spain
TELEFONICA		1924	-	0%	33.83%	1988: 4.55%, 1994: -1.72%, 1995: 10.71%, 1997: 20.5%, 1998: 0.24%, 1999: 0.31%	Spain
TISA – Telefonica Internacional		1992	-	0%	23.78%	1997: 23.8%	Spain
Telia AB	-		1993: II	0%	100%	2000: 30%, 2002: 70%	Sweden
TeliaSonera AB (SWE)	Private Company	2002	-	37.3%	46%	2003: 0.7%, 2007: 8%	Sweden
Swisscom AG	State Company	1849	1998 : III	52%	100%	1998: 34.5%, 2002: 2.8%, 2004: 0.2%, 2006: 7.7%, 2007: 2.8%, 2008: -3.2%	Switzer-land
British Telecom plc	Private Company	1846	1981: II	0%	100%	1984: 52.4%, 1991: 21%, 1993: 26.6%	UK
Cable and Wireless plc	Private Company	1860	-	0%	100%	1981: 50%, 1983: 27%, 1985: 23%	UK

Note: * Type of Formal Privatisation:

I: Transformation from a departmental agency towards a public corporation

II: Transformation from a public corporation towards a state company

III: Transformation from a departmental agency directly towards a state company

For details please be referred to p. 7

BIOGRAPHICAL NOTE

Carina Schmitt and **Philipp B. Schuster** are research fellows at the Collaborative Research Center "Transformations of the State", University of Bremen.

Carina Schmitt

Telephone:	+49 421 218 7860
E-Mail:	carina.schmitt@sfb597.uni-bremen.de

Philipp B. Schuster

Telephone:	+49 421 218 8711
E-Mail:	philipp.schuster@sfb597.uni-bremen.de

Fax:	+49 421 218-8721
Address:	University of Bremen, Collaborative Research Center „Transformations of the State", Linzer Strasse 9a, D 28359 Bremen