

THE NEW PUBLIC ENTERPRISE:  
A SURVEY AND RESEARCH AGENDA

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# The new public enterprise: a survey and research agenda

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## Abstract

The paper reviews some research issues on a classic topic in public economics: the role of public enterprises. After more than two decades of privatizations, a rethinking of the scope, objectives, governance, finance and performance of public providers of services seems needed. First, recent literature on how to define the scope of public enterprises in a new environment will be surveyed and assessed, in order to shape an agenda for research on this topic. Second, the paper offers some evidence of the survival of public enterprises after the waves of privatizations, particularly in the EU. Third, a theoretical framework is proposed in order to define a new research agenda on public enterprises.

*Keywords:* Public enterprise, Government ownership, Public provision

*JEL codes:* H11, H40, L32

## 1. Introduction

Do public enterprises have a future? After the age of privatisation, is a new policy reversal possible? Does the financial meltdown of 2008 spur a new role of public provision of some services? And if this is going to happen, what can economists say about the objectives, the scope, organization, finance and accountability of a new generation of public providers of goods for services general interest? These are the broad questions that we address in this paper. We do not present findings, but a research agenda for the future.

We suggest that after more than two decades of privatization policies in the EU and elsewhere, a reappraisal of the role, the performance, and possible reforms of the surviving public enterprises seems long overdue. In this context “*public enterprise*” should be understood in a comprehensive way, as an organisation, or a system of production, that delivers goods or services in the public interest, such as water, energy, telecoms, transport, health, education, etc. This definition does not include companies owned by the public sector for purely financial reasons (for example because of receivership under governmental control, etc); it does not include governmental institutions, (such as the judiciary, representative bodies, administration of taxes, etc). It is related instead to a wide array of public sector ownership types (State Owned Enterprises, henceforth SOEs), local public firms, mostly government ownership of listed companies, and other forms where the control is clearly in the hands of the public sector).

Some of the more vocal supporters of large scale privatisation policies in the last two decades have acknowledged little scope for the public provision of services. They advocate a very limited role for governments, to be seen as just light-hand regulators of liberalized industries. In many countries, however, public enterprises did not disappear, and in some cases are strong, efficient, and supported by a wide consensus in citizen’s opinion surveys. These public organisations survive in various

forms of state ownership, partial privatisation, corporatisation, municipalisation, and other institutional frames. In some countries, more recently, following failures of private operators, there have been some renationalization and re-municipalisation episodes.

We want to assess the state of the art on public enterprise research in the EU, in the perspective of public economics and focus on ideas for future developments, in order to learn from past mistakes. Is it possible to draft an agenda for the new public enterprise, taking advantage of recent perspectives in regulatory economics, incentive theory, transaction costs, consumer protection and participatory approaches in government planning? Or should we go beyond these mainstream perspectives? An Agenda for the New Public Enterprise should probably carefully consider some weak points of the old nationalised industries in some countries, without however assuming that past experience has nothing to say for the future of the surviving public enterprises. There are different historical patterns in public enterprises, and it would be inappropriate to consider a unique paradigm of public provision. In an evolutionary perspective, can we say, however, that some models have been more successful than others? There are clearly differences across the sectors concerned as well as the history, but can we learn from past and current experiences?

The structure of the paper is the following. In the next section we briefly and selectively review some earlier ideas on public enterprises, based on the received doctrines in public economics and on more recent contributions, focussing on the recent trends in privatizations and reform of SOEs. In section 3 we present new evidence about the stock of public enterprises in some sectors, focussing on the EU. Section 4 proposes a research agenda for the future, as a preliminary step to a new project in this area. Section 5 concludes.

## **2. Earlier Literature**

In the last three decades, the provision of services of general interest (SGI) went through a widespread process of privatization in many countries. However, public enterprises have not been crowded out by private provision, and still play a crucial role in several sectors, especially in infrastructural sectors as shown in a recent survey of the World Bank (see Estache and Goicoechea, 2005) On the one hand, the performance of privatized incumbents is sometimes found to be disappointing; on the other hand, public enterprises have been extensively studied and reformed. Public enterprises went through three main waves of reforms. The first occurred in the 1970s and 1980s. According to Vagliasindi, 2008, and Gómez-Ibañez, 2007, its main goal was to improve the performance of SOEs without affecting public ownership. The results were often perceived as unsatisfactory. A second round of major reforms was implemented in the 1980s and 1990s. Public

enterprises were sold or licensed to private investors. This round was more successful than the first, at least in terms of efficiency, but in some countries the private sector did not work as well as expected. Privatization did not turn out to be the panacea for all problems as hoped. Currently, a third wave of reforms has started, and focuses on the improvement of SOEs without affecting public ownership.

From a theoretical perspective, public ownership is justified by different arguments. The provision of SGI can generate natural monopolies. The application of the principal-agent theory to issues of regulation (see Laffont and Tirole, 1993) provides the appropriate framework of analysis for these contexts. However, recent episodes of market liberalization have made mixed oligopoly, where private firms coexist and compete with the public supplier, a very common market structure. While the private firms aim at profits, the public enterprise maximizes the objective function of the public principal. As clearly illustrated by De Fraja and Delbono, 1990, the policy implication in terms of nationalization or privatization or mixed provision depends on the setting chosen by the analyst and the empirical analysis is crucial to determine the appropriate set of hypothesis to start with. Further developments in this literature have considered a host of different assumptions to study mixed oligopoly, for example homogeneous or differentiated goods (Cremer et al., 1991), or the analysis of partially-privatized firms (Matsamura, 1998). Another approach considers the relationship between the public authority and the managers: the presence of politicians who aim at pleasing voters does not necessarily lead to the conclusion that privatization increases welfare (Willner, 2001).

From the empirical point of view, there exists a burgeoning literature on the differences in performance and efficiency between public and private enterprises. Two main lines of research can be identified. The first directly compares the performance of public and private firms (Vining and Boardman, 1992; Reeves and Ryan, 1988; Dewenter and Malatesta, 2001), while the second studies the performance of a public firm which has been privatized, before and after the privatization (see for example Boubakry and Cosset, 1998, D'souza et al. 2000). Recent research has also considered the effects of partial privatization (see Gassner et al., 2009). According to Megginson and Netter, 2001, among others, empirical evidence favors private over public ownership. However, as argued by Villalonga, 2000, there is no clear evidence in support of private or public ownership. Other studies fail to find a clear superiority of private over public firms (e.g. Kwora, 2005), or find that other variables, such as market structure, have a more relevant role in explaining public enterprises' performance (Hernandez de Cos et al., 2000; Florio, 2003, 2004, 2007; Florio and Brau, 2004; Vickers and Yarrow, 1991). This mixed evidence calls for a detailed empirical analysis of the role and performance of SOEs in the current economic situation.

Even though there is no consensus on the superiority of private ownership, scholars and analysts have considered different ways of reforming public enterprises. Corporatization is one of the most acclaimed options (see, for example, Vagliasindi, 2008). The OECD (OECD, 2005 and Brumby et al., 1998) published some guidelines to improve the governance of SOEs. These guidelines suggest corporatization but also a series of other specific instructions such as an increase in transparency, independent directors, a higher reliance on private lenders without government's guarantees, the listing of a minority share of the enterprise to facilitate disclosure of information, and lastly a clear specification of responsibilities and objectives for policymakers and owners. We think, however, that these guidelines suffer from a major drawback. The public firm is supposed to behave as a private firm, but we argue that the goals and incentives for a public firm are by definition different from those of a private firm and this difference should not be ignored in a reform process. In the following sections we will provide a snapshot of the role and presence of the public sector in the EU and suggest a detailed research agenda for the New Public Enterprise.

### **3. Empirics**

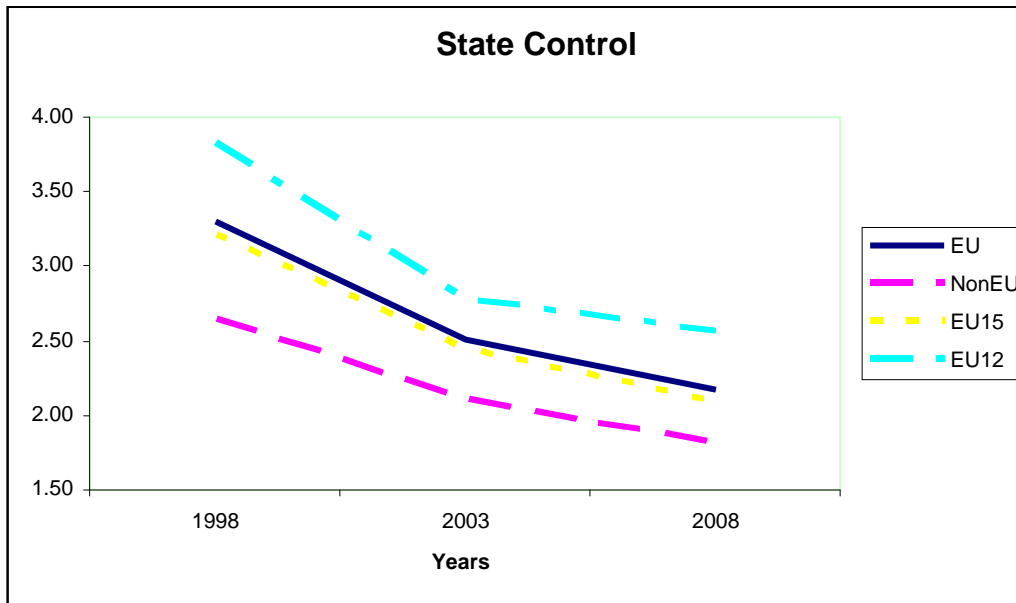
In order to have a better understanding of the current and future role of the public sector and of SOEs, some synthetic indices have been proposed by the OECD, in the context of an assessment of product market regulation. In this section we will therefore provide some graphical description of the importance and overall trends of the public sector in OECD countries, disaggregating information between EU and non-EU countries, and looking at evidence for Old and New Member States (EU15 and EU12, respectively).<sup>1</sup> All indices are on a 0 to 6 scale, with 0 corresponding to no role for the public sector and are part of a broader set of indicators for product market regulation (Wolf et al., 2009, OECD, 2008).

The first index we consider is the overall level of state control in the economy, with a specific focus on public ownership (Figures 1 and 2). State control “reflects the extent to which governments influence firm decisions through public ownership, price controls or other forms of coercive – instead of incentive-based – regulation”.<sup>2</sup> It is clear that state control has in general decreased across the whole sample between 1998 and 2008, with the New Member States (NMS) having overall higher government intervention with respect to EU15 and non-EU OECD countries. In general, European countries in the OECD seem to be characterized by a higher level of state control, albeit decreasing over time.

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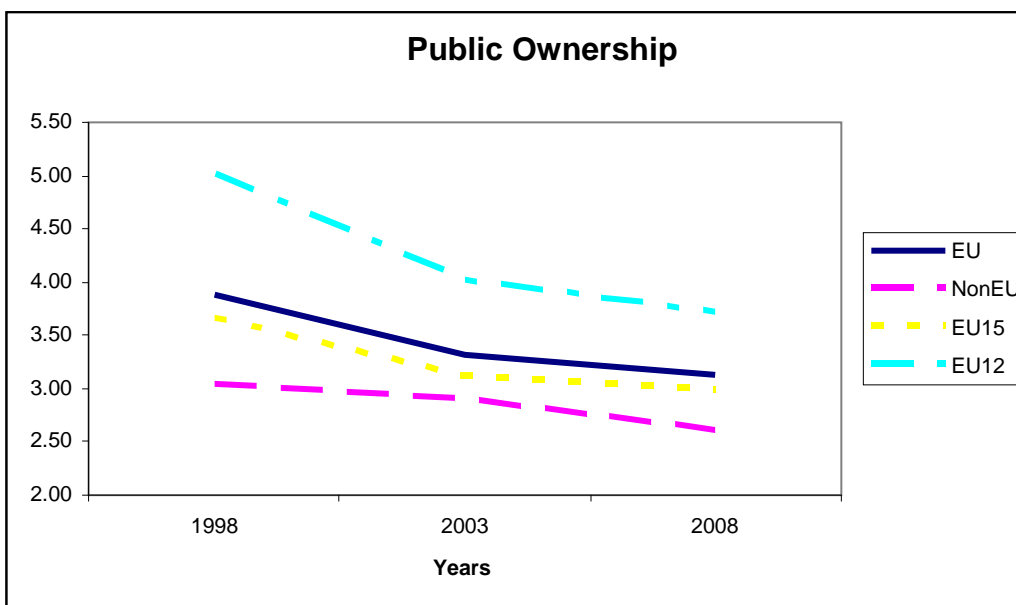
<sup>1</sup> EU15 countries in the OECD: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom. EU12 countries in the OECD: Czech Republic, Hungary, Poland, Slovak Republic. Non EU OECD countries: Canada, Iceland, Japan, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey, USA.

<sup>2</sup> Wolf et al., 2009, p. 12.



**Figure 1: Degree of State control in OECD countries 1998-2008**

Looking specifically at public ownership, the general trend for non-EU countries is confirmed, while there appears to be a slight upward trend after 2003 for EU15 countries.



**Figure 2: Public Ownership in OECD Countries 1998-2008**

In order to understand the general trends just presented, we concentrate our analysis on low-level indicators, to better disentangle the characteristics of public sector involvement in economic activities. Figures 3-6 show the evolution of specific indices for our sample, for which we provide a formal definition. The scope of the public sector measures “the pervasiveness of state ownership across business sectors as the proportion of sectors in which the state controls at least one firm (based on 24 business sectors); direct control over business enterprises measures the existence of government special voting rights in privately-owned firms, constraints on the sale of state-owned

equity stakes, and the extent to which legislative bodies control the strategic choices of public enterprises (based on 24 business sectors)”.<sup>3</sup> Government involvement in infrastructure instead measures the extent of public ownership in the infrastructure sector.

From Figure 3 we once again see that, while in non-EU OECD countries state ownership seems to be in sharp decline, the same is not true for EU countries after 2003, especially NMS.

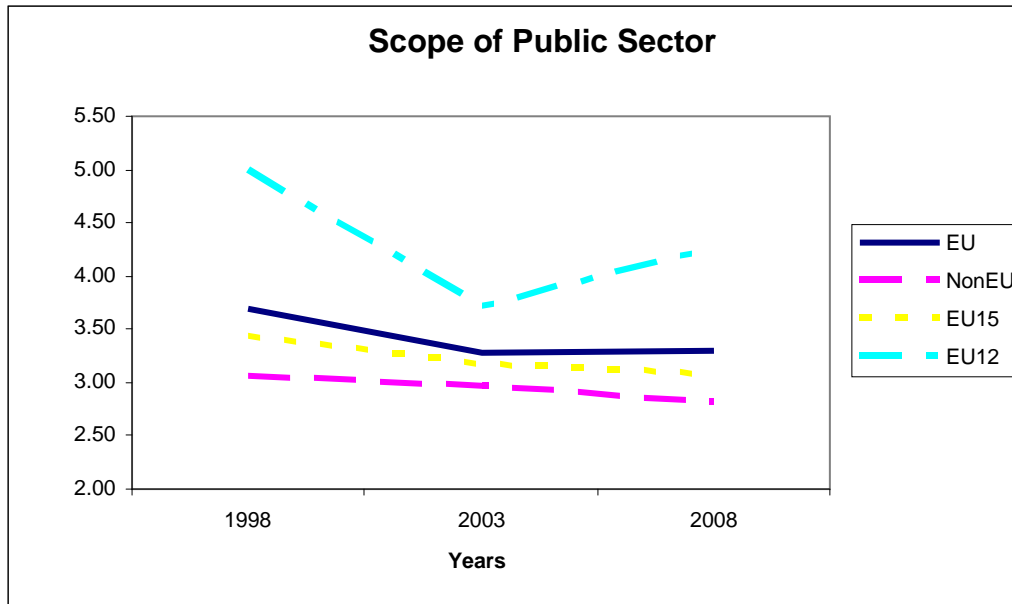


Figure 3: Scope of public sector in OECD Countries 1998-2008

Figure 4 shows again a different picture for EU and non-EU countries: it appears that, while non-EU countries seem to be stable over time, EU15 countries are experiencing an increase of the overall direct control over business enterprises.

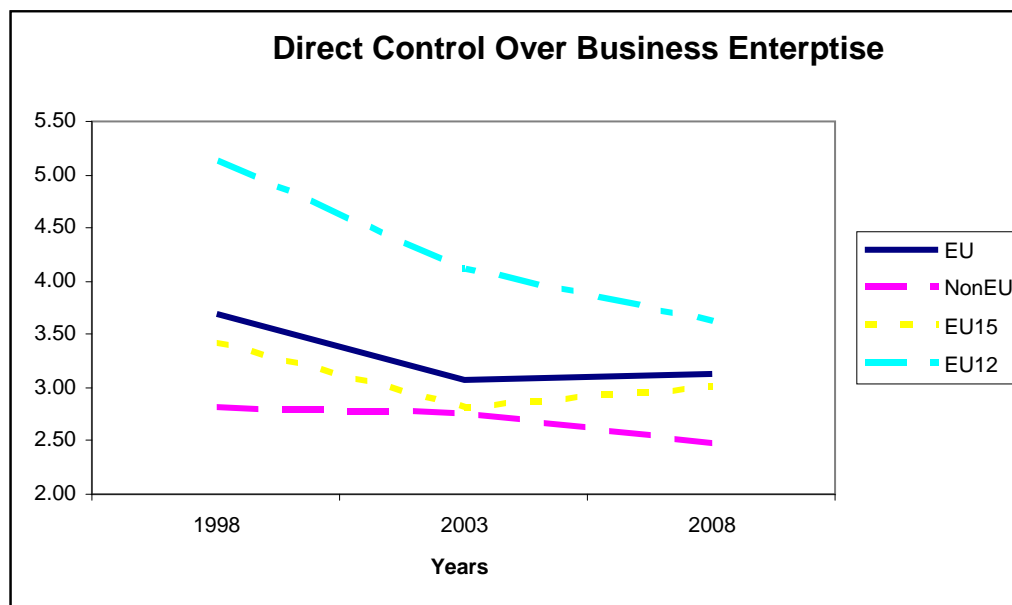
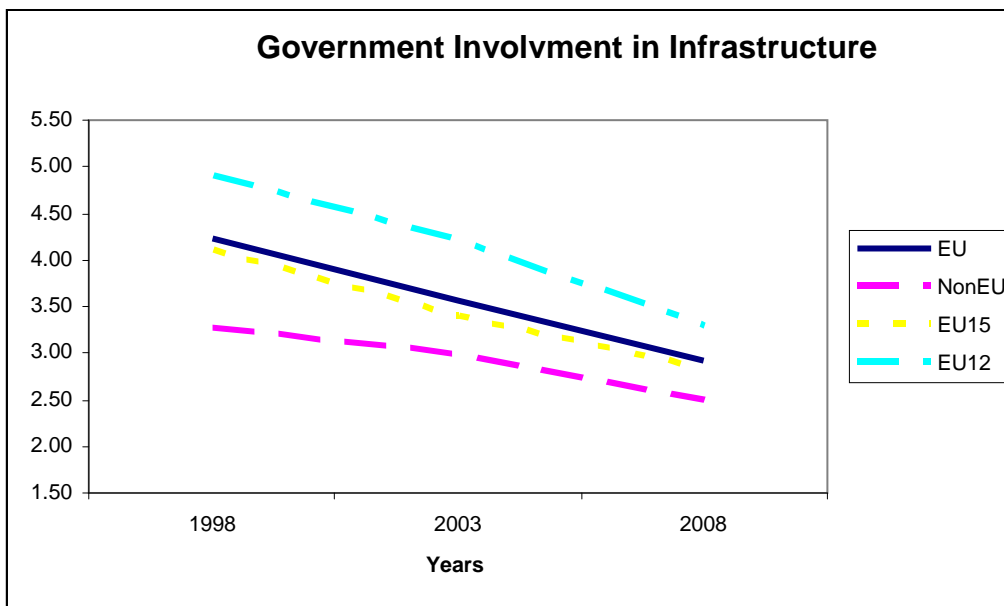


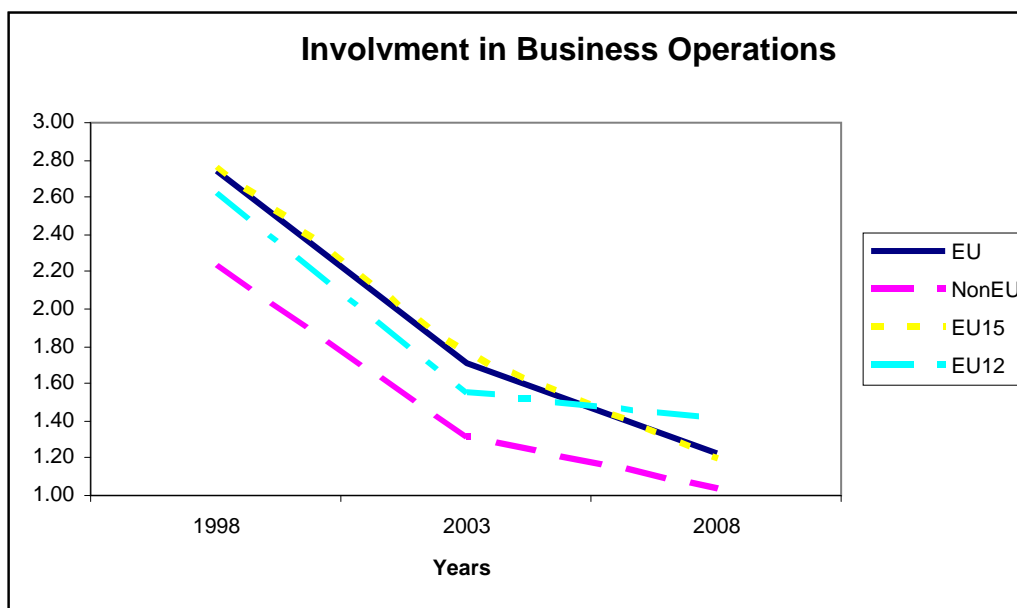
Figure 4: Direct control over business enterprise in OECD Countries 1998-2008

<sup>3</sup> Wolf et al., 2009, page 10.

Figures 5 and 6 highlight the decreasing public involvement of the public sector both in business operations and in the infrastructure sector for all OECD countries.



**Figure 5: Government involvement in infrastructure in OECD Countries 1998-2008**



**Figure 6: Involvement in business operations in OECD Countries 1998-2008**

This simple descriptive analysis allows us to conclude that, while at a first glance, the role of the state seems to be decreasing in all OECD countries, some interesting patterns and different trends emerge when we look at specific dimensions of the public sector’s role and we examine EU and non-EU countries separately, considering also the important differences between Old and New Member States. This conclusion is corroborated by looking at the evolution of overall government investment as a share of total investment between 1970 and 2006 for EU countries.<sup>4</sup> If we look at

<sup>4</sup> DICE Entry Institutional Climate Index, 2009.



five year averages (Figure 7) for the corresponding index (range 0-10 with 10 corresponding to the highest government share in investment), we see that the general trend is decreasing for all OECD countries. If we instead focus on recent yearly data for 2000-2006 (Figure 8), we can see that there has been a halt in the downward sloping trend for EU15 countries, while the NMS have experienced an increase in the share of public sector investment, a trend which would probably be strengthened if data for 2007-2008 were included.

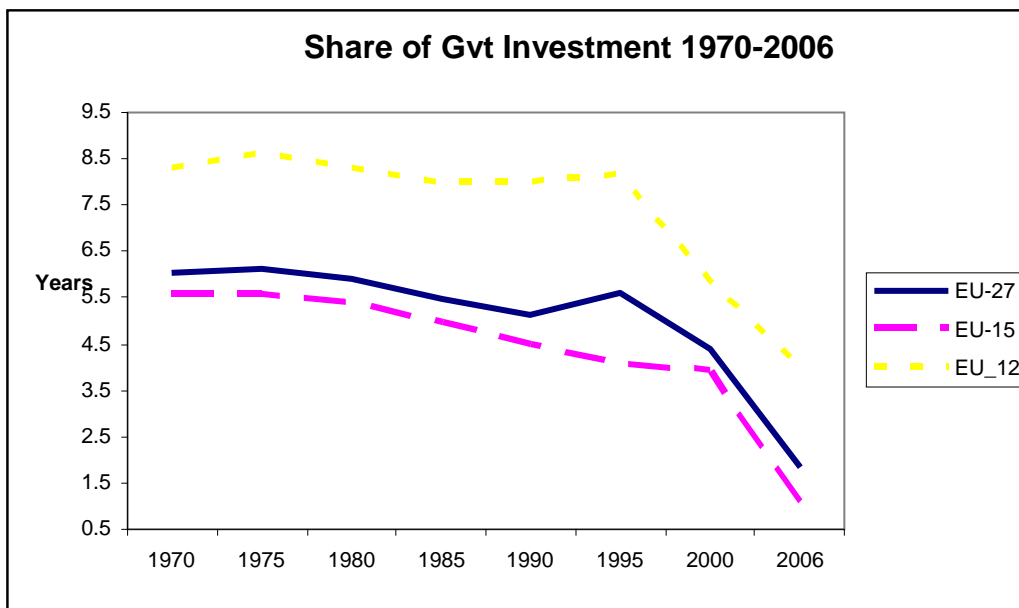


Figure 7: Share of government investment for EU27 countries 1970-2006 (5-year averages)

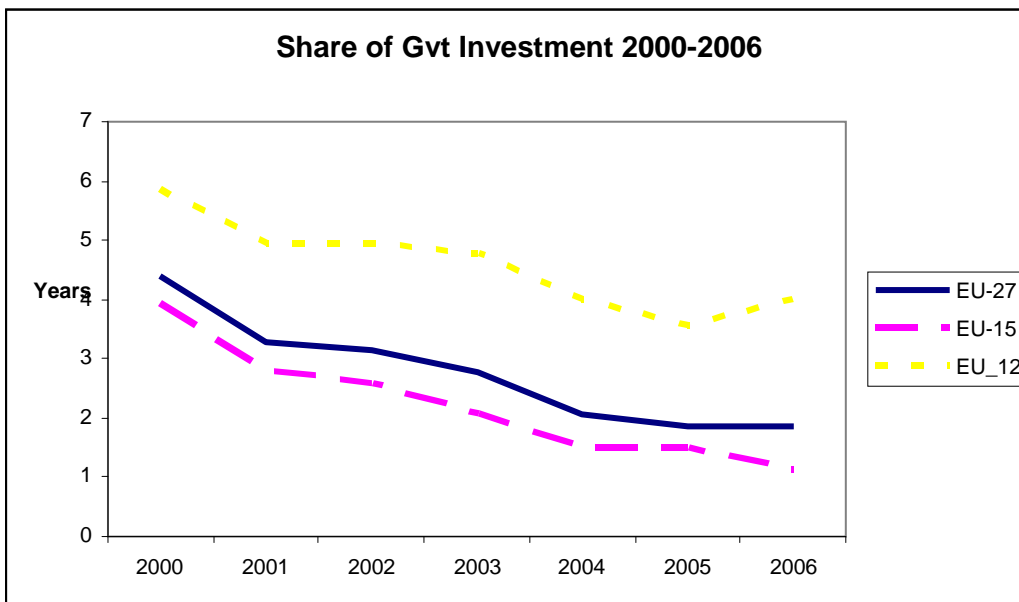


Figure 8: Share of government investment for EU27 countries 2000-2006 (yearly data)

Table 1 shows a detailed country breakdown of the public ownership index between 1998 and 2008. While the negative trend detected in the aggregate measures presented so far is still evident, a few

comments are in order. The UK, for example, actually displays an increase in public ownership, due to the fact that the first wave of privatizations took place at the end of the 1970s, before other OECD countries, and the general performance of privatized companies was not always as good as expected, leading to a slight policy reversal. Overall, cross country variability seems relevant and a more detailed analysis, considering a sectoral dimension as well, is necessary to fully understand the process.

<b>Public ownership</b>	<i>1998</i>	<i>2003</i>	<i>2008</i>	$\Delta_{(2008-1998)}$
Australia	3.22	3.17	3.21	-0.17%
Austria	4.70	3.83	3.48	-25.94%
Belgium	2.78	2.40	2.53	-8.91%
Canada	1.83	1.83	1.76	-3.65%
Czech Republic	4.97	3.88	3.57	-28.28%
Denmark	2.86	2.04	2.05	-28.45%
Finland	3.93	3.28	2.76	-29.88%
France	4.61	4.23	3.68	-20.15%
Germany	3.11	2.80	2.76	-11.28%
Greece	4.45	2.90	n.a.	n.a.
Hungary	4.48	4.09	2.28	-49.26%
Iceland	2.58	2.17	1.45	-43.66%
Ireland	3.38	2.68	n.a.	-20.71%
Italy	5.04	3.91	3.40	-32.50%
Japan	2.58	2.35	2.01	-22.13%
Korea	3.17	2.86	2.76	-12.83%
Luxembourg	2.56	3.45	3.36	30.86%
Mexico	3.64	3.29	2.86	-21.57%
Netherlands	3.48	2.86	2.58	-25.91%
New Zealand	1.76	2.40	2.60	47.78%
Norway	3.90	3.47	3.18	-18.38%
Poland	5.57	4.94	5.32	-4.42%
Portugal	4.30	3.91	3.69	-14.21%
Slovak Republic	n.a.	3.15	n.a.	n.a.
Spain	3.73	2.98	2.53	-32.06%
Sweden	4.32	4.05	4.06	-6.03%
Switzerland	3.83	3.52	3.39	-11.44%
Turkey	5.31	5.31	4.01	-24.57%
UK	1.48	1.48	1.90	28.80%
United States	1.63	1.50	1.30	-20.15%

**Table 1: OECD Cross-country variability of Public Ownership 1998-2008**

Given the importance that the public sector still has in the economy of EU countries, albeit with different levels and scope of involvement, a detailed analysis on micro-data is particularly relevant to compare private and public firms, in order to investigate the role of ownership in determining firms' performance and to ultimately understand how to improve performance public firms. To this aim we present some descriptive statistics on a micro-level dataset of European firms in SGI industries which will be at the basis of our future empirical research.

Data on European firms are extracted from the Amadeus database maintained by the Bureau van Dijk. The Amadeus dataset provides detailed comparable balance-sheet data on over 11 million firms in 41 European countries. Our sample is composed by firms of EU 27 countries in 2007 in SGI sectors, namely air transport, land transport, water transport, energy, postal services, telecommunications, and water supply and sewerage.

The Amadeus database is accompanied by the BvDEP Ownership Database, which allows us to classify firms as privately- or publicly-owned. The Ownership database reports data for owner and subsidiary links across EU countries and firms with over 24 million active and direct links providing information on over 9 million companies. A link is defined as an ownership relationship between two entities, a shareholder and a subsidiary. A shareholder might be a corporation, a private individual, a government or a collectively described entity. The subsidiary is, however, always a corporation. Among the types of shareholders, we are interested in the category “Public authorities, States, Governments” which includes states, governmental agencies, governmental departments, or local authorities.

The Database provides data on direct and indirect shareholders and on the domestic and global Ultimate Owner, if any. The Ownership Database tracks control relationships rather than patrimonial relationships; therefore, when there are different categories of shares, only those with voting rights are considered. A link between two entities is indicated even when the percentage is very small and the main shareholder is identifiable.

A link between two firms can be direct, when an entity owns a certain percentage of a company, or indirect, when an entity owns a certain percentage of a company through a participation in a third company.

Moreover, the Database reports the Ultimate Owner if any. For all the companies not classified as independent, consequently without an Ultimate Owner, the shareholder with the highest direct or total percentage of ownership is identified. If this shareholder is independent, it is defined as the Ultimate Owner of the subject company. If the highest shareholder is not independent, the same process is repeated to him until the Ultimate Owner is found, distinguishing between a domestic and a global Ultimate Owner.

In order to analyze the differences between private and public firms and the peculiarities of publicly-owned firms, we define as public all the firms either with an Ultimate Owner classified as “Public authorities, States, Governments” or, in case of an independent firm, with the controlling shareholder classified as “Public authorities, States, Governments”.

The following tables report a description of available data for selected sectors according to the NACE Rev. 2 at a 2-digit level. For each industry, we show the number of firms recorded, the share

of public firms, the percentage of employees occupied in public companies compared with total employment in the relevant industry, and the average size in terms of median employees.

Country	Number of firms		Firms with data on employees		Total employees		Median employment	
	Total	% public	Total	% public	Total	% public	private	public
Austria	92	3.3%	72	1.4%	9,584	1.3%	4	120
Belgium	29	3.4%	13	7.7%	3,747	23.9%	32	896
Bulgaria	589	0.7%	576	0.7%	7,698	17.3%	3	339
Czech Republic	7	14.3%	6	16.7%	8,286	90.5%	15	7,500
Denmark	45	0.0%	26	0.0%	6,631	0.0%	41	
France	90	4.4%	79	2.5%	9,714	5.4%	9	263
Germany	295	2.4%	118	3.4%	111,349	0.3%	3	7
Greece	14	0.0%	10	0.0%	812	0.0%	37	
Hungary	52	1.9%	19	5.3%	2,749	69.4%	10	1,908
Ireland	121	4.1%	28	0.0%	10,269	0.0%	7	
Italy	40	10.0%	34	8.8%	6,013	3.0%	47	45
Latvia	5	0.0%	5	0.0%	980	0.0%	80	
Lithuania	2	0.0%	2	0.0%	140	0.0%	70	
Netherlands	72	1.4%	55	1.8%	35,929	0.1%	5	43
Poland	24	12.5%	7	14.3%	582	66.7%	19	388
Portugal	25	8.0%	16	0.0%	1,662	0.0%	11	
Romania	56	1.8%	39	2.6%	3,629	64.4%	5	2,338
Slovakia	1	0.0%	1	0.0%	750	0.0%	750	
Spain	106	0.0%	82	0.0%	38,271	0.0%	15	
Sweden	55	1.8%	34	0.0%	4,117	0.0%	17	
United Kingdom	1,822	0.2%	187	1.6%	150,291	0.7%	77	175
Total	3,543	1.2%	1409	1.6%	413,203	4.0%	5	160

**Table 2: Air transport**

In Table 2 we show statistics for the air transport sector. This sector includes the transport of passengers or freight by air or via space. We can highlight that overall the share of public ownership with respect to the total is quite low (1.6%) in terms of number of firms, while it represents 4% of employment in this sector. The cross country comparison shows some interesting patterns in the NMS, where the relative importance of the public sector, especially in terms of employment, is significantly higher than in EU15 countries. The average size of public firms is much higher than private enterprises, as shown by the median employment.

Table 3 provides evidence for the land transport sector, which includes the transport of passengers and freight via road and rail, as well as freight transport via pipelines. Measuring the importance of the public sector in terms of number of firms or of employees is relevant. In fact, while on average the number of public firms is around 1%, the share of persons employed in the public sector is 33% and the median size of these firms is much bigger than private ones.

Country	Number of firms		Firms with data on employees		Total employees		Median employment	
	Total	% public	Total	% public	Total	% public	private	public
Austria	4,521	1.5%	4069	1.3%	76,267	31.5%	4	38
Belgium	977	1.9%	849	1.6%	41,364	5.7%	20	39
Bulgaria	12,019	0.4%	11989	0.4%	96,793	34.8%	2	58
Czech Republic	1,316	0.2%	1168	0.2%	72,152	0.6%	15	207
Denmark	1,855	0.3%	1397	0.4%	34,971	2.0%	7	129
France	8,060	0.9%	7697	0.9%	529,795	45.6%	12	98
Germany	14,386	2.4%	6641	3.7%	576,006	65.6%	6	109
Greece	177	1.1%	130	1.5%	11,860	4.8%	12	287
Hungary	5,869	0.0%	1959	0.0%	59,784	0.0%	6	
Ireland	1,636	0.7%	390	2.1%	15,253	43.1%	11	111
Italy	911	20.3%	728	21.4%	253,046	72.7%	39	194
Latvia	467	0.4%	467	0.4%	24,867	0.1%	16	13
Lithuania	594	0.2%	594	0.2%	17,587	0.1%	15	20
Luxembourg	137	1.5%						
Netherlands	3,150	0.5%	2869	0.5%	152,556	17.3%	14	26
Poland	1,604	7.7%	847	13.5%	220,079	65.9%	29	250
Portugal	9,581	0.0%	9003	0.0%	75,301	0.0%	2	
Romania	17,861	0.1%	13149	0.1%	169,350	23.9%	3	101
Slovakia	8	12.5%	8	12.5%	3,650	41.1%	225	1,500
Slovenia	1	0.0%	1	0.0%	556	0.0%	556	
Spain	7,965	0.6%	7070	0.7%	205,829	11.2%	9	74
Sweden	838	1.9%	712	1.8%	47,643	16.7%	12	30
United Kingdom	26,139	0.2%	1277	1.5%	792,553	2.7%	83	158
Total	120,072	0.9%	73,014	1.1%	3,477,262	32.7%	4	125

**Table 3: Land transport**

Country	Number of firms		Firms with data on employees		Total employees		Median employment	
	Total	% public	Total	% public	Total	% public	private	public
Austria	46	8.7%	35	11.4%	575	23.8%	6	39
Belgium	92	0.0%	52	0.0%	1,538	0.0%	7	
Bulgaria	97	3.1%	97	3.1%	6,522	5.3%	2	17
Czech Republic	11	0.0%	9	0.0%	118	0.0%	15	
Denmark	477	0.0%	194	0.0%	131,566	0.0%	13	
France	170	2.9%	124	2.4%	17,551	9.4%	15	161
Germany	3,007	0.7%	1198	1.2%	19,785	2.8%	2	13
Greece	20	5.0%	15	6.7%	3,717	0.4%	74	16
Hungary	71	0.0%	18	0.0%	900	0.0%	13	
Ireland	158	3.2%	37	8.1%	2,088	32.2%	13	178
Italy	139	5.8%	107	6.5%	25,667	16.8%	76	266
Latvia	3	0.0%	3	0.0%	315	0.0%	50	
Lithuania	10	10.0%	10	10.0%	1,937	0.8%	150	15
Luxembourg	16	6.3%			0			
Netherlands	586	1.0%	401	0.5%	10,100	5.0%	5	252
Poland	43	18.6%	30	23.3%	3,742	80.3%	12	20
Portugal	111	1.8%	68	2.9%	2,018	3.7%	5	37
Romania	184	1.6%	132	2.3%	3,650	15.3%	9	92
Spain	224	0.9%	184	1.1%	10,127	0.1%	10	4
Sweden	182	0.5%	101	1.0%	13,210	0.0%	19	1
United Kingdom	2,115	1.6%	274	4.4%	90,681	20.7%	25	147
Total	7,762	1.3%	3089	2.1%	345,807	8.9%	4	47

**Table 4: Water transport**

Table 4 shows descriptive statistics for our sample in the water transport industry. This sector includes the transport of passengers of freight over water. Public firms in our sample represent 2% of the total number, while accounting for 9% of employment. As reported for the other industries related to transport, the median size of public firms is larger than the one of private enterprises. It is important to note that in our sample the relevance of public enterprises in air, land and water

transport shows relevant differences across EU countries.

Table 5 reports descriptive statistics for our sample of firms of the electricity, gas, steam and air conditioning supply sector. This group includes the generation of bulk electric power, transmission from generating facilities to distribution centers and distribution to end users.

The presence of public ownership in the energy sector is highly relevant, with a share of 14% in our sample. While firm size is slightly higher in the public sector, the main difference is detected by looking at employment levels.

Country	Number of firms		Firms with data on employees		Total employees		Median employment	
	Total	% public	Total	% public	Total	% public	private	public
Austria	564	14.9%	381	14.7%	21,358	73.2%	2	54
Belgium	140	22.9%	48	20.8%	8,280	5.7%	10	2
Bulgaria	354	5.9%	332	6.0%	34,856	65.6%	3	735
Czech Republic	198	5.6%	175	6.3%	23,298	37.3%	23	75
Denmark	484	0.2%	106	0.9%	10,768	6.1%	5	653
Estonia	156	3.2%	85	5.9%	3,221	8.9%	5	48
Finland	180	15.0%	104	17.3%	17,773	72.7%	14	65
France	788	19.7%	267	15.7%	285,018	21.3%	3	41
Germany	9,246	9.1%	3390	16.5%	285,083	33.2%	2	39
Greece	115	7.0%	25	16.0%	34,619	99.5%	4	225
Hungary	403	0.7%	154	0.6%	22,512	0.0%	22	1
Ireland	354	0.6%	32	0.0%	720	0.0%	6	
Italy	871	34.0%	527	37.4%	87,185	32.6%	10	19
Latvia	13	7.7%	11	9.1%	3,850	3.9%	56	150
Lithuania	56	12.5%	50	14.0%	9,562	40.1%	50	688
Luxembourg	9	22.2%	1	100.0%	35	100.0%		35
Netherlands	225	17.8%	120	18.3%	29,958	28.6%	2	28
Poland	690	14.9%	478	19.7%	146,789	53.6%	60	185
Portugal	377	3.7%	151	5.3%	16,030	1.8%	3	26
Romania	232	4.3%	193	5.2%	63,774	21.4%	29	237
Slovakia	6	16.7%	6	16.7%	15,600	28.8%	1500	4,500
Spain	3,930	0.6%	718	1.4%	108,473	0.4%	5	12
Sweden	542	12.4%	270	10.0%	51,499	58.7%	21	69
United Kingdom	2,305	0.8%	236	2.5%	251,819	5.6%	39	354
Total	22,238	8.0%	7,860	14.2%	1,534,080	28.3%	3	45

**Table 5: Electricity, gas, steam and air conditioning supply**

Table 6 shows data for the postal and courier sector, which includes postal and courier activities, such as pickup, transport and delivery of letters and parcels under various arrangements. In particular, this industry, as classified according to NACE Rev.2, includes as subsectors “Postal activities under universal service obligation” and “Other postal and courier activities”. In our sample, this industry appears to be comprised of few public firms with a disproportionately high share of employees (60%) and average size. This is due to the fact that in some countries the postal service is under direct public control, and is subject to service obligation.

Country	Number of firms		Firms with data on employees		Total employees		Median employment	
	Total	% public	Total	% public	Total	% public	private	public
Austria	73	2.7%	62	1.6%	24,144	95.4%	3	23,045
Belgium	45	4.4%	34	5.9%	3,465	23.8%	28	412
Bulgaria	85	3.5%	84	3.6%	19,096	78.0%	2	235
Czech Republic	157	1.9%	129	2.3%	20,504	51.0%	7	375
Denmark	82	3.7%	55	5.5%	3,017	29.3%	9	229
France	105	2.9%	99	3.0%	306,444	99.2%	10	841
Germany	1,217	1.5%	632	1.9%	499,669	90.0%	2	274
Greece	26	7.7%	19	10.5%	13,790	3.7%	45	258
Hungary	341	0.0%	40	0.0%	897	0.0%	12	
Ireland	187	1.1%	23	4.3%	1,750	45.7%	15	800
Italy	14	21.4%	9	22.2%	157,782	99.3%	61	78,378
Latvia	5	20.0%	5	20.0%	1,329	5.3%	81	71
Lithuania	4	25.0%	4	25.0%	550	27.3%	50	150
Luxembourg	6	0.0%						
Netherlands	207	0.5%	190	0.5%	217,057	0.0%	10	19
Poland	30	10.0%	19	15.8%	105,459	97.6%	10	1,600
Portugal	124	0.8%	119	0.8%	17,370	0.1%	3	26
Romania	490	0.4%	295	0.7%	40,127	1.4%	3	282
Spain	310	1.6%	276	1.4%	78,557	91.8%	10	1,887
Sweden	15	20.0%	13	23.1%	26,194	91.8%	84	1,534
United Kingdom	1,903	0.4%	68	4.4%	409,054	0.2%	47	90
Total	5,426	1.2%	2175	2.3%	1,946,255	59.7%	5	386

**Table 6: Postal and courier activities (53)**

Country	Number of firms		Firms with data on employees		Total employees		Median employment	
	Total	% public	Total	% public	Total	% public	private	public
Austria	146	5.5%	117	5.1%	9,198	55.6%	2	6
Belgium	134	10.4%	79	7.6%	8,607	32.0%	11	128
Bulgaria	92	1.1%	91	1.1%	17,903	0.1%	8	17
Czech Republic	121	2.5%	101	3.0%	15,392	3.9%	7	225
Denmark	212	3.3%	125	4.0%	23,663	2.8%	9	42
France	453	6.0%	361	4.2%	216,854	87.0%	9	20
Germany	2,110	1.2%	1129	1.5%	311,752	1.0%	2	38
Greece	55	3.6%	39	2.6%	26,542	0.1%	15	30
Hungary	604	0.3%	167	0.0%	20,354	0.0%	7	
Ireland	650	0.3%	186	0.5%	10,449	1.2%	9	126
Italy	170	13.5%	116	12.1%	113,982	4.4%	21	20
Latvia	53	9.4%	53	9.4%	3,721	20.7%	17	76
Lithuania	50	0.0%	50	0.0%	2,769	0.0%	20	
Luxembourg	4	25.0%						
Netherlands	305	1.0%	248	0.4%	6,594	0.9%	5	58
Poland	341	5.9%	158	11.4%	56,893	71.5%	15	100
Portugal	153	0.7%	123	0.0%	12,198	0.0%	5	
Romania	2,151	0.4%	1478	0.6%	51,462	12.4%	3	42
Slovakia	5	20.0%	5	20.0%	10,795	13.9%	838	1,500
Slovenia	1	0.0%	1	0.0%	2,079	0.0%	2079	
Spain	923	0.9%	739	0.8%	336,430	1.0%	5	59
Sweden	175	6.3%	116	6.0%	43,410	65.6%	9	572
United Kingdom	8,080	0.4%	666	2.9%	489,983	2.8%	27	94
Total	16,988	1.2%	6148	2.2%	1,791,030	16.8%	5	66

**Table 7: Telecommunications**

In Table 7 we show descriptive statistics of our sample for the telecommunications industry. This sector includes the activities of providing telecommunications and related service activities, that is transmitting voice, data, text, sound and video.

Looking at telecommunications, once again the percentage of public firms is quite low but with an

important share of total employment.

Country	Number of firms		Firms with data on employees		Total employees		Median employment	
	Total	% public	Total	% public	Total	% public	private	public
Austria	539	4.3%	438	4.1%	9,197	2.7%	5	9
Belgium	311	7.4%	210	7.1%	11,902	22.6%	10	41
Bulgaria	278	24.8%	272	25.4%	24,755	61.9%	3	74
Czech Republic	534	1.1%	451	1.3%	27,834	12.9%	15	750
Denmark	247	0.0%	166	0.0%	6,094	0.0%	8	
France	1,734	8.7%	1573	8.5%	157,714	16.0%	11	46
Germany	5,441	7.9%	2049	11.3%	157,117	25.1%	9	45
Greece	58	3.4%	32	3.1%	6,481	9.7%	10	631
Hungary	1,122	0.1%	406	0.2%	27,701	1.4%	22	374
Ireland	591	0.2%	111	0.9%	2,266	0.9%	10	20
Italy	1,042	43.5%	797	43.2%	99,955	58.0%	23	48
Latvia	15	0.0%	15	0.0%	2,118	0.0%	84	
Lithuania	44	0.0%	43	0.0%	4,743	0.0%	76	
Luxembourg	6	0.0%						
Netherlands	694	3.0%	570	2.8%	17,794	41.4%	6	166
Poland	977	1.9%	667	2.4%	69,663	2.7%	64	75
Portugal	447	0.0%	404	0.0%	16,249	0.0%	8	
Romania	1,624	0.4%	1142	0.5%	53,459	2.4%	6	123
Slovakia	2	0.0%	2	0.0%	600	0.0%	300	
Spain	763	8.1%	643	7.9%	52,448	43.7%	10	81
Sweden	219	4.1%	171	4.1%	8,232	17.3%	15	44
United Kingdom	3,828	0.7%	320	3.8%	146,408	7.1%	54	122
Total	20,516	6.3%	10482	8.9%	902,730	21.1%	11	50

**Table 8: Water supply, sewerage, waste management and remediation activities**

Finally, Table 8 displays descriptive statistics for water supply, sewerage, waste management and remediation activities. This sector, in our sample, is characterized by high public involvement, both in terms of number of firms and of workers employed.

Given the descriptive analysis of our sample extracted from the Amadeus database, a further research step will be an empirical analysis of the differences between private and public firms and on the role of institutions in shaping the performance of these two groups of firms in the EU.

There are two research approaches that we want to explore:

- a) Pair matching of private and public firms and difference-in-difference econometric analysis of their performance, as in Gassner et al., 2009;
- b) Testing the role of institutions and governance variables as determinants of the performance of public enterprises (Laffont, 2005).



#### **4. Theoretical Background and Research Agenda**

One view within past approaches to public enterprises was to see them as part of a government planning mechanism. The confidence in planning, after the collapse of Soviet-type economies and the weakening of many socialist parties in Western Europe, is widely questioned by different strands of theoretical research. Incentive theory has focussed on information asymmetries between principal and agents, and on divergence in their motivations. Regulatory economics has discovered how difficult it is to set rules for any industry in a dynamic context. From an entirely different perspective, supporters of participatory approaches to government are highly suspicious of delegation to central bodies of a wide range of functions. It seems difficult however to detach public provision from planning. And, in turn policy, programme or project evaluation without a planning context is void of content.

In other words, the association between governmental planning of service provision and public ownership of providers cannot be considered entirely out of question. How can we state the conditions for success of a link between planning and provision of services? This issue is related to the governance topic (see below), but it goes beyond it, because it implies a reflection on the role of democracy in the formulation of public policies and plans. To what extent does the changing role of public enterprises reflect changes in public policy objectives, in the changing weights given to competitiveness, full employment, or redistributive equity, for example? In principle, an appropriate social-cost benefit analysis can be applied to evaluate public policies and projects for the provision of services in order to support planning and project selection. Is this an alternative or a complement to democratic decision processes on government choices?

We tend to see this issue as a complement rather than as an alternative, and here we focus only on the welfare economics reasoning, building on Drèze and Stern (henceforth DS) 1987, 1990 and Florio, 2007. We do not attempt here to translate our general ideas into practical reform recipes, but we just want to set some working hypotheses for future, theoretical and applied research. At a later stage, this can also lead to policy reform implications. Before moving on, however, we present a sketch of the DS analytical framework in the following box, while we derive the main formulae we refer to in the main text.

Definitions and Formulae

*Project*: a change in the net supply of goods by the public sector.

*Social planner*: the project evaluator with a social welfare function.

*Policy*: a rule that associates a state of the economy with a (public) production plan. Appropriate signals have to be provided to incentivize people to the desired investment decision or behavior.

*Environment*: vector of signals  $s$  of dimension  $k=1 \dots K$ .

*Aggregate net demands*:  $E : s \rightarrow E(s)$ .

*Public production plan*:  $z = (\dots, z_i, \dots)$  net supply of the public sector, a production plan of dimension  $i$ , where  $i$  is the index for commodities (including time, space and state of the world).

*Scarcity constraint*:  $E(s) - z = 0$ .

*Side constraint*:  $s \in S$ , where  $S$  is the opportunity set of the planner.

*Project*: marginal change  $dz$  (a small project).

*Social Welfare Function*:  $V : s \rightarrow V(s)$

*Social planner's problem* :

$$\begin{aligned} & \max V(s) \\ \text{s.t. } & E(s) - z = 0 \text{ with } \frac{\partial z_i}{\partial s_n} = 0. \\ & s \in S \end{aligned}$$

A *policy* is a function  $\Phi(\cdot)$  that associates  $z \rightarrow s$ , i.e. it associates a production plan to a vector of signals, such that

$$\begin{aligned} & \Phi_k(z) = s_k \\ (s, z) \text{ meets the side and the scarcity constraints: } & \text{s.t. } (s, z) \text{ meets} \\ & s \in S \\ & E(s) - z = 0 \end{aligned}$$

*Shadow prices*: impact on social welfare of a change in the public provision of a good (first derivative of the social welfare function around the optimum respect to the good considered):  $v \equiv \frac{\partial V}{\partial s} \cdot \frac{\partial \Phi}{\partial z}$

*Optimal production plan*: given by:

$$\begin{aligned} & \max_z V^*(z) \\ \text{s.t. } & z \in Z \\ & v^* z^* = \max_{z \in Z} v^* z \end{aligned}$$

Given  $F(z)$ :  $dV = \frac{\partial V}{\partial s} \frac{\partial \Phi}{\partial z} dz$

*Fully determined case with multiple levels of government*: a regional government may be faced with a single policy option. In this case the optimal policy is given by:

$$\begin{aligned} & \max_s V(s) \\ \text{s.t. } & E(s) - z = 0 \\ & s \in S \end{aligned}$$

The unique trivial solution is  $s^*$ . The shadow price vector is:  $v = \frac{\partial V(z^*)}{\partial z} = \frac{\partial V}{\partial s} \frac{\partial s}{\partial z}$ .

**Box 1: The Basic DS framework**

Shadow prices<sup>5</sup> arise as the solution to the optimization of the Social Welfare Function (SWF) in a model with consumers, producers, a social planner and in which the economy is characterized by price rigidities, quantity rationing, trade quotas and exogenous taxes and transfers. As stated in DS, 1987, “the shadow price of a commodity is the total impact on social welfare of a unit increase in the net supply of that commodity from the public sector”. The economy is characterized by private agents (consumers and firms) and a planner, by a set of signals  $s \in S$  (including producer and consumer prices  $p$  and  $q$ , taxes  $t$ , quantity constraints  $\bar{x}_i$  etc, which are parameters  $\omega$  if exogenous) to which agents respond, by a public production plan  $Z$ , and by a set of scarcity and side constraints. The planner has control over signals in order to determine the optimal demand compatible with the exogenous production plan  $Z$ ,<sup>6</sup> therefore controlling the environment to which private agents respond to. Formally, the planner maximizes a SWF subject to constraints:

$$\begin{aligned} & \max_s W\left(V^1, \dots, V^h(p+t, \bar{x}^h, m^h), \dots, V^H\right) \\ & s.t. \begin{cases} \sum_{h=1}^H x^h(p+t, \bar{x}^h, m^h) - \sum_{g=1}^G y^g(p, \bar{y}^g) - Z = 0 \\ s \in S \end{cases} \end{aligned}$$

$$\text{with } E = \sum_{h=1}^H x^h(p+t, \bar{x}^h, m^h) - \sum_{g=1}^G y^g(p, \bar{y}^g)$$

where  $h$  denotes households,  $g$  firms,  $p$  are producer market prices,  $t$  indirect taxes,  $y$  and  $Z$  are private and public supplies,  $x$  is a vector of consumer demands,  $v$  are the Lagrange multipliers of the side constraints (which coincide with shadow prices in the model without side constraints),  $V$  is the individual utility, barred variables represent quantity constraints or rations and income  $m^h = r^h + \sum_g \theta^g \pi^g(p, y^g)$  is the sum of lump sum transfers and the share of profits  $\theta$ . The shadow

price vector is the gradient of the maximum value function  $V^*$ . The corresponding Lagrangean is:

$$L = W\left(V^1, \dots, V^h(p+t, \bar{x}^h, m^h), \dots, V^H\right) - v \left( \sum_{h=1}^H x^h(p+t, \bar{x}^h, m^h) - \sum_{g=1}^G y^g(p, \bar{y}^g) - Z \right).$$

The net effect on social welfare of a small shift of any parameter  $\omega$  is indicated by the gradient of the Lagrangean.  $Z$  is the net supply of the public sector, which adjusts the net private supply  $E(s)$ .  $\omega$  is part of  $s$ , the set of signals through which the public sector influences private agents' economic

<sup>5</sup> For a discussion of shadow wages in the DS general equilibrium setting, see Del Bo, Fiorio, Florio, 2009.

<sup>6</sup> Which can be both optimally or not optimally chosen.

behavior. Formally, for any parameter  $\omega_k$ ,  $\frac{\partial V^*}{\partial \omega_k} = \frac{\partial L}{\partial \omega_k} = \frac{\partial V}{\partial \omega_k} - \nu \frac{\partial E}{\partial \omega_k}$  is the marginal social value (MSV). The value of a parameter is optimal from the planner's point of view when its marginal social value is zero.

By considering the MSV of a lump sum transfer to consumer  $h$  ( $r^h$ ), we can define  $b^h$  and  $\beta^h$ , i.e. the welfare weight, which is the social marginal utility of consumer  $h$ 's income, which in turn depends on lump sum transfers.

$$\text{Formally: } b^h \equiv MSV_{r^h} = \frac{\partial W}{\partial V^h} \frac{\partial V^h}{\partial m^h} - \nu \frac{\partial x^h}{\partial m^h} \quad \text{and} \quad \beta^h \equiv \frac{\partial W}{\partial V^h} \frac{\partial V^h}{\partial m^h}.$$

With these definitions in mind, MSV for each commodity may be computed. By setting the MSV of control variables (such as for example prices) to zero, we can study the shadow pricing rules and optimal policy rules. By studying the MSV of predetermined variables, we can study directions of welfare-improving reforms.

This concludes our analysis of the analytical framework we have in mind and we now move on to describe our research agenda in detail.

*Working hypothesis 1: No plan, no public enterprise*

*A necessary (but not sufficient) condition for establishing a public enterprise is the existence of a public production plan in the goods space.*

One weak point of the past generation of public providers in some countries was the decoupling between production units under the control of the public sector and production plans and related objectives. By a public production plan we understand that the net demand of the private sector is met by units under the control of a government layer in such a way that public provision balances the demand. The economic environment is defined by a set of *signals* that can include *e.g.* producer prices, indirect taxes, direct taxation on production factors, property rights (with public ownership as a firm that is owned by everybody or by nobody, see below) and consumption or production rations. Rationing can be applied on production or on consumption, and can be in the form of 'not less than' or 'no more than'. Given a set of goods that define individual, hence social welfare in the standard framework, any government may in fact steer the economy in such a way as to balance public provision and net private demand. Running a deficit in the public sector simply means shifting the planning horizon into the future. We disregard money. Thus, if there is no well defined public transport plan by the local or national government, the government's control of a provider of public transport is inconsistent. If the provider behaves as a private firm, it is not clear why is

should be under control (ownership) of the public sector. If however, the government has, for some reason, a plan to offer public transport to disabled people (in-kind subsidy), this is a necessary condition to have in place a provider of the service. In other words, no plan implies no public enterprise.

It is important to understand that the public production needs not to be optimal in some social welfare sense. In other words, the provision of one unit of public transport will be offered only if its general equilibrium social cost is less than its social benefit, until for the marginal unit provided the net benefit is zero. And the shadow price of the service offered, whatever the tariff paid by the disabled person, will be the social opportunity cost of the service. Clearly, a benevolent, fully informed, government will adopt optimal plans. This is not however a necessary condition neither for planning nor for public provision. This point is often misunderstood in applied welfare economics, and needs to be clearly restated here.

Suppose that for some information constraints the government does not know with certainty the demand of school minibuses in a rural area. Ex-post the plan can turn out to be sub-optimal, with some excess supply or demand, but ex-ante the expected value of demand, under the Arrow-Lind theorem of public sector risk neutrality, is usually appropriate. Moreover, suppose that the local government is constrained by insufficient transfers from the national government and cannot offer the optimal amount of transport. The plan will be constrained efficient, even if sub-optimal, and it can be shown that the same cost-benefit rules apply. The only important point is that the plan must be feasible, *i.e.* it should respect resource constraints and additional constraints, if any.

#### *Working Hypothesis 2: Policy Optimality Condition*

*Public provision evaluation needs that policy selection is second-best optimal in each control area.*

Let us define, following the DS frame, a policy as a function that associates a production plan to a set of signals. If the local government wants to offer public housing at a discount (compared to market prices) to disadvantaged social groups, a policy is needed that establishes *e.g.* the appropriation of a share of added value taxes revenues in that area to finance the plan. This is often a misunderstood issue in social CBA and we go back to basics. If a shadow price is defined as the social opportunity cost of a good, or equivalently as the social welfare change related to the supply (or consumption) of a unit of a good (a small change), and we consider the general equilibrium effects (including redistribution), then in principle the rules involved for picking up the right policy and the right project (*i.e.* the right change in the public sector production plan) are the same. Suppose a range of policies are available, *e.g.* a certain combination of indirect taxes and of tariffs to support an increase in public housing for students or the poor. There is no way to define if a

project is socially beneficial if at the same time you do not fix the related policy. The problem is trivial if only one policy is available, but what can we say when the municipality has a menu of policy opportunities? In such a circumstance there is no way to compute the social benefit of the project because it depends upon the shadow prices, which in turn depend upon the policies. In plain words you have to compare the welfare gains and losses of beneficiaries of the housing project and of tax-payers, and you cannot do it if the welfare problem is not solved looking on both sides of the welfare change under the two policies. Thus, picking the optimal indirect tax-tariff combination that supports the project is the same as computing the net benefit of the project given that optimal combination of signal. While this may seem abstract, it has an important implication for public provision (and possibly for public enterprises): the selection of a sub-optimal policy alters the logic of the welfare calculation of the benefit of public provision. As we shall see, this fact has some consequences for the design of governance, accountability and performance evaluation, hence incentives for the decision makers.

*Working Hypothesis 3: No Exit Condition*

*A sufficient condition for public provision is that private provision at market prices is impossible, while there is a socially valuable net private demand for the goods.*

Private firms respond to signals set directly or indirectly by the government (national or local). In fact they are *defined* in such a way. Firms are profit maximizers at observed prices, *i.e.* at prices that are determined by supply and demand under taxation, rationing, and other uncompetitive features. Differently from the unrealistic world of the Two Fundamental Theorems of Welfare Economics, we live in second-best economies, that are constrained in several ways, as Stiglitz, 1994, has convincingly shown, focussing on capital, labour and knowledge markets. Differently from the private firm, the public firm behaves as the agent of a principal, the government, who is here a social welfare maximizer (see below for a departure from this assumption). The fact that, given the set of signals set by the government, there is a demand for some goods that cannot be satisfied by private firms is the widest possible definition of market failure. This definition, however, is quite different from the textbook one. Private demand in any second best economy is itself determined not just by individual preferences and by technology: it is also determined by signals. These signals, however, are in some cases policy parameters for the consumer or the firm. Consumer and production prices can be influenced by the government through taxes, subsidies and rations. Thus ‘market’ prices are never supporting Walrasian equilibria in the traditional meaning. Individual markets can clear with excess demand and excess supply (one version of this is Benassy, 2006). Electricity is a clear example of “no exit”. While electricity reforms have invented several ways to

try to establish competitive markets, a fundamental deviation from pure competition exists for that industry. No government can allow private firms to shut down their operations if market prices are such that they face losses. California is a recent episode. In transport, Railtrack, the listed owner of tracks in the UK, went near to bankruptcy. NATS, the privatized air traffic control is another example. In these three cases, governments had to act *de facto* as providers of last resort (whatever the formal ownership arrangements). Testing industries with the No Exit Condition is a simple shortcut to see whether the social planner attaches a positive value to operations (at shadow prices) even when private firms would close down.

Let us resume the three conditions in a simple way in the following Proposition.

*Proposition 1*

*Under symmetric information and benevolent government, public provision is socially beneficial when there is a well defined public production plan for some goods, when policy and projects, i.e. changes in the production plan, are selected in such a way as to pass a social cost-benefit test at shadow prices, and production cannot be shut down for some goods.*

It is important to stress that, in this context, public procurement by a private firm is virtually fully equivalent to public provision. We now move to a less abstract and more complex economy, where the world deviated from the previous frame in several ways, and we discuss if and how the previous hypotheses can be adapted to additional features.

*Working Hypothesis 4: Not (fully) benevolent government and production plan*

*Let us suppose that policy-makers are not (fully) of the benevolent type, and they have private interests attached to public production. This pushes the public production plan further away from optimality. However, shadow prices rules do not change.*

A government prone to vested interests will adopt a bad public provision plan, perhaps because it is corrupted by some specific interests. For example, it will exaggerate the need of railways, because policy-makers (we use this in a broad sense) get side payments from suppliers of inputs to the public railway. While this distorts the ‘starting point’ of the welfare evaluation, it does not change the welfare test and the shadow pricing logic for an independent evaluator. This is a direct consequence of the proposition that optimality of the plan is good, but not needed to define shadow prices.

*Working Hypothesis 5: Distorted policy adoption*

*Policy-makers that want to please their constituency can adopt sub-optimal policies.*

Differently from WH4, a non benevolent dictator or elected policy-maker can distort policy adoption in such a way that sub-optimal policies are selected. This will undermine welfare enhancing project selection because shadow prices should be based on policies that are not actually implemented. In other words, the wrong projects will be selected.

*Working Hypothesis 6: Corruption distorts ownership patterns*

*Government's corruption distorts the decisions of privatization or nationalization in a non linear way.*

This is suggested by Laffont, 2005, who also suggest an empirical test. In the above framework, a consequence is that control of firms will be sub-optimal, but not necessarily in one direction. Firms can be nationalized to extract rents from them, or can be privatized for the wrong reasons.

*Working Hypothesis 7: Asymmetric information*

*Under asymmetric information public provision (ownership) and public procurement are no more equivalent.*

This is easily understood in the Laffont and Tirole (LT), 1993, and subsequent developments, and does not need to be commented here. A well known consequence of this is that public ownership emerges as an efficient mechanism to counteract strong and socially costly rents of efficient agent types, as in the incomplete contracts literature. Under public ownership *strictu sensu* there is no separation between the principal and the agent. *De facto*, any public firm is a form of public procurement, with different legal arrangements, and managers of public or private firms may be more or less self interested, more or less willing to disclose information, etc.

Let us now formally summarize WH 4-5-6-7 as follows:

*Proposition 2*

*Under not (fully) benevolent government, and asymmetric information, while shadow pricing rules do not change if the production plan is further distorted from the optimal one, sub-optimal policy adoption leads to inconsistency in project selection. The allocation of property rights will also be distorted, as privatization or nationalization are signals fixed by the government. Public provision and public procurement will be not equivalent, in general, while public provision can be seen as a form of public procurement.*



The world of Proposition 1 is quite different by the world of Proposition 2. We clearly live in the latter, but we need to understand the former to improve on it.

The independent welfare economist can, in principle, compute her own optimal production plan and pick up second best policies by shadow prices that are consistent with social cost benefit analysis of projects. Public provision will emerge naturally in a second best world from the No Exit Condition. Conversely, pessimistic public choice economists will tend to look at government as intrinsically inefficient and corrupt and will tend to suggest to give it the least possible role in production (and in regulation). They will use Proposition 2 as support for the market mechanism.

The meaning of Proposition 2, combined with Proposition 1, is however quite different. It suggests that in a world with a specific type of corruption (i.e. corruption in policy adoption) nothing can be said about private or public provision and ownership, because both can be the result of government's capture.

In other words, a (partly) corrupted government that adopts a wrong public provision plan for railways, but picks-up optimal tariff and taxation policies to support it, is much less damaging in welfare terms than a government that adopts an optimal production plan but with seriously distorted policies to support it.

When you combine corruption with asymmetric information, a particularly crucial policy, *i.e.* the allocation of property rights is distorted and either privatization or nationalization can be wrong.

Thus, on a more positive perspective, Proposition 2 suggests that democracy should focus on policy adoption more than on production plans.

We turn now to ownership *per se*.

The distinction between public enterprise, ownership, provision and procurement from a theoretical point of view might well differ from current usage of the terms.

In the DS framework a production unit under the full control of a governmental body is in the public sector, hence is a public enterprise. This has nothing to do with its ownership. A privately owned firm (henceforth POE) that is included in a government production plan and must respect commands from its regulator, *e.g.* on outputs, on prices and purchases of inputs etc., is not different from a state-owned firm that is also part of the production plan. If either SOEs or POEs have some freedom in their choices, you may assume that they behave as cost minimizers, but this is not warranted in the LT frame.

Let us for while ignore the latter issue and assume cost minimization for any type of firm.

Conversely, a SOE not fully controlled by the regulatory body is in the private sector, because it will simply respond to signals given its objectives and constraints. One can think, for example, to

partly-privatized utilities where the management, after its appointment by the governmental body, behaves independently from the production plan  $z$ .

Thus public provision of a good simply means that a quantity  $z_i$  is assigned to production units  $j=1,2,\dots,J-G$ , while the remaining production units,  $j=G, G+1,\dots,J$ , are in the private sector and do not have any planned objective.

One natural way in the DS setting to model this is to say that POEs have possibly quantity constraints on their output that are non binding for at least one good, while SOEs' output is entirely rationed.

In terms of notation, there are two ways to see a SOE. One is to say that  $\theta=0 \forall h$ , *i.e.* SOEs are nobody's ownership. An alternative is that  $\theta^h = \frac{1}{H}$ , so that the SOE is owned by everybody through its status of citizenship, *i.e.* it is an endowment, with profits possibly taxed 100% away.

When looking at ownership in this way, it is clear why the only difference between a POE and a SOE lies in their inclusion/exclusion in the production plan. In fact "*public firms*" in financial economics are private firms with dispersed ownership, and in principle they can also be everybody's ownership.

Thus, we can understand public procurement as the contract linking a POE to the plan, and under our previous hypothesis of cost minimization, the difference is immaterial if profits are entirely taxed or if there is competitive procurement under symmetric information.

Interestingly, one can think of production units that are public-private partnerships, PPP, not because of the ownership arrangements, but because they are partly included in the plan and partly free: one example is a SOE in the health sector that offers both planned assistance and market services for the rest of its capacity (typically extra hours of its personnel).

Having shown that ownership per se is immaterial in defining the public enterprise, we must link the DS and LT frame to show that after all a difference may emerge.

Suppose now that the regulator/social planner is the owner of the SOE (or elected by citizens-owners). You may assume that because it owns the production unit it is well informed on its technology and can monitor the effort of its management. This may not hold between different layers of government, but here we refer to one single layer. This assumption is no more realistic when the regulator faces a POE. Hence, one way now to differentiate public and private firms is to note that the former is under the information set of the planner, while the latter is not. Again you can conceive intermediate cases, but it is simpler to focus on polar cases.

In this context ownership includes the right to be informed by the shareholder. Thus, a POE, even if included in the public plan under a procurement contract, is now no longer equivalent to a SOE

because information is asymmetric, and informative rents can be earned by efficient types in the LT framework.

Finally, let us assume that the planner is not entirely benevolent and has a private agenda, hence the SOE is not cost minimizing. Is this enough to say that POEs under the plan will be more socially efficient than SOEs? This is not sure in the LT framework, because two inefficiencies need to be compared: the socially costly profits of rents earned under public procurement by private owners and the similarly socially costly rents of the not fully benevolent regulator, see Ceriani and Florio, 2008, for a simple example.

As mentioned above, while the production plan can be sub-optimal, for instance because of constraints or the private agenda of the regulator, if the latter can profit from policies, the implied social inefficiency is more serious than when it profits from a sub-optimal plan.

We now summarize and conclude by stating the following Proposition.

*Proposition 3: Policy benevolence*

*If the social planner is not fully benevolent but cannot profit from policy design, shadow prices are sufficient statistics for changes of the public plan. SOEs will be welfare superior to POEs if the rents of the planner are less than the rents of the POEs under procurement, and shadow prices must be used to compare the outcomes.*

As a consequence of this proposition, under strong asymmetric information and in a country where the government is sufficiently honest and accountable, and cannot manipulate policies, SOEs will be preferred to implement the plan.

In countries where the government is very corrupt, and information asymmetries are low, hence contracts are easy to design and monitor, POE will be preferred. In intermediate cases the solution depends upon a set of parameters.

In the DS framework, the smallest control area is the fully determined case, when policy is exogenous to the (local) layer of government. Thus, the true trade-off between POE and SOE is when there is a range of policies to be selected, different levels of corruption, and different information structures.

One can think of a family of models that make ownership choice in the implementation of the production plan a function of a small set of parameters for welfare maximization.

Finally, we restate that public provision and public ownership are different issues, and that the two dimensions can be considered in part as mutually independent.

## **5. Conclusions**

Our research question can be succinctly summarized as follows: Is it desirable and possible to reconsider the role of public enterprises after two decades of privatizations? Our answer is positive for two reasons: first, public provision is still there and will stay there in the future, and we need to discuss how to manage it. Second, and more important, we are understanding again that markets cannot do everything that societies need. Some privatizations were probably part of a financial bubble, and must be reconsidered. Section 3 of this paper has shown that in a large sample of sectors in the EU, more than 20% of employees still work in SOEs. Empirical analysis will investigate, against the background of the previous discussion, whether institutional quality leads to better performance of SOEs.

The research agenda we suggest points to an integration of welfare economics, public choice and incentive theory, and asks a fundamental question: how to design institutions and select policy makers that, even if partly self interested, are prevented from destroying the welfare rationale for policy adoption.

Besley, 2006, offers a theory of the selection of policy makers, which gives us many insights, but does not directly solve the problem we have identified through Proposition 2. The world of Proposition 1 is just a benchmark. The possible way out is the world of Proposition 3, where realism about corruption and asymmetric information is combined with reforms that channel rents where they are less damaging.

If the greater threat to social welfare comes not from sub-optimal public provision plans, but from wrong and self interested policies, what can we say about mechanisms that contain this class of actions?

This is not an easy question, and not necessarily a question that an economist is better equipped than a political scientists to answer. It is, however, in our opinion the core of any revival of the public enterprise.

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