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Governance Arrangements for State Owned Enterprises

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Abstract

The aim of this paper is to shed new light on key challenges in governance arrangements for state owned enterprises in infrastructure sectors. The paper provides guidelines on how to classify the fuzzy and sometimes conflicting development goals of infrastructure and the governance arrangements needed to reach such goals. Three policy recommendations emerge. First, some of the structures implied by internationally adopted principles of corporate governance for state owned enterprises favoring a centralized ownership function versus a decentralized or dual structure have not yet been sufficiently "tested" in practice and may not suit all developing countries. Second, general corporate governance guidelines (and policy recommendations)

need to be carefully adapted to infrastructure sectors, particularly in the natural monopoly segments. Because the market structure and regulatory arrangements in which state owned enterprises operate matters, governments may want to distinguish the state owned enterprises operating in potentially competitive sectors from the ones under a natural monopoly structure. Competition provides not only formidable benefits, but also unique opportunities for benchmarking, increasing transparency and accountability. Third, governments may want to avoid partial fixes, by tackling both the internal and external governance factors. Focusing only on one of the governance dimensions is unlikely to improve SOE performance in a sustainable way.

Governance Arrangements for State Owned Enterprises

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1. Introduction

Contrary to an initial impression and against the background of extensive literature on the success and failure of private sector participation in infrastructure, the great majority of infrastructure services are still delivered by state owned enterprises (SOEs). A recent World Bank survey (Estache and Goicoechea, 2005) has found that the private sector is less widespread than it is often assumed both in the academic and policy arena. Roughly, only one-third of the developing countries can count on private operators for the delivery of electricity, water, or railways services.[1] The largest presence is in the fixed line telecoms business where about 60% of the countries rely on private operators. Moreover, the results of the survey show that the private sector has roughly contributed 20-25% of infrastructure investments in developing countries on average over the last 15 years or so.

Although the definition of developmental goals in infrastructure service provision and, more importantly, the methodology to be used to assess the extent to which such developmental goals have been met remain controversial, some progress has been made both in the academic and policy arena. Notably, the focus of analysis has shifted from the resources used (inputs) to the services delivered (outputs). This has prompted the development of an ambitious measurement agenda, aimed at capturing both the efficiency and equity goals of infrastructure provision, as well as the institutional and governance arrangements needed to reach such goals. In turn, the measurement agenda devoted attention to the extent to which improving SOE performance can bring about substantial gains in developing countries. A number of studies estimated that even a relatively small improvement in operational efficiency, say 5%, could free resources around 1-5% of GDP.[2] SOE inefficiency reduces economic growth and the pace of development in many ways. First, SOE operational losses create budgetary pressure and contribute to the country's increasing fiscal deficits. Subsidization of SOEs can increase public debts, raising real interest rates and reducing overall investment. Second, financing SOE losses causes the diversion of resources from essential public tasks. It leads to overall misallocation of scarce resources, thereby, harming the country's growth potential and its development goals.[3] Last but not least, poor infrastructure provision greatly limits the economic opportunities for poor households and enterprises with no means to opt for alternative sources of generation of water, transport and electricity.

In light of the above, governments may want to consider spending as much time and effort benchmarking and assessing the performance of public infrastructure providers as they do (or would do) for private operators. In order to increase the *accountability* of the sector and minimize costs to the other stakeholders (i.e., the users and the taxpayers), governance arrangements need to be carefully designed and monitored.

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[1] This result is even more striking considering that in this context the existence of private sector participation simply means that these sectors have been unbundled enough to allow some parts to be operated by the private sector. In many instances, the segments in which the private sector is present might not be essential to the operation of the infrastructure service.

[2] See Jones (1991) and the earlier studies referred to therein.

[3] A thorough review of the sources of SOE inefficiencies is described by Akram (2003), Omran (2002) and World Bank (2004) respectively for the case of Bangladesh, Egypt and Iraq. See also the interesting debate discussed in Basu (2005).

The structure of this paper is as follows. Section 2 describes the infrastructure developmental goals and the extent to which they can be assessed and measured. Section 3 considers corporatization as one of the options to increase SOE performance and separate the efficiency and equity objectives. Section 4 introduces the governance arrangements and the institutions that represent the ownership function with a focus on the experience of OECD countries. Section 5 develops a simple theoretical framework, whereas section 6 reviews which external governance models have been more dominant in practice, highlighting their advantages and disadvantages. Section 7 considers internal mechanisms to incentivize management. Section 8 concludes.

2. SOE reforms and performance assessment

The concern about SOE performance is not new. As part of a first wave of reforms during the 1970s and 1980s, policymakers, donors and international financial institutions (IFIs) made a major effort to improve SOE performance while maintaining public ownership. This effort, however, generally failed.

This failure led to a second round of reforms, through the sale, licensing or concession of enterprises to private investors. The key belief, reinforced by the then prevailing economic theory, was that private ownership (under complete information) can achieve the socially most desirable (*first best)* results, as long as the government can bind private firms competing for the contract and regulate them with appropriately designed contracts. Despite the fact that this second round of reforms was more successful than the first one, at least from an economic efficiency perspective, it was limited in geographic and sectoral coverage (as discussed above). It generated a sense of distrust in the private sector, as confirmed for instance by the results of opinion polls run in many countries, such as the Latin American Barometer.[4]

We are now getting into the third wave of reforms, and the focus seems to be shifting back to the improvement of SOEs while maintaining public ownership. The key idea is that in the presence of *market failures*, the public and not the private sector can get closest to the achievement of social and developmental objectives, in terms of *productive*, *allocative* and *distributional* efficiency. Unregulated or misregulated private ownership can bring about different forms of performance failures in both developed and developing economies in infrastructure and network industries. This is because they are characterized by several idiosyncrasies, including: *i)* sunk investment cost and capacity which might lead to monopolistic elements; *ii)* production of intermediate goods characterized by public goods features; and *iii*) additional external benefits and costs, such as environmental impacts.

At this conjuncture, the main dilemma is that -- as experience has proven -- it is not only the market that can fail. The existence of a number of *governmental and regulatory failures*, due to informational asymmetries, high transaction costs and collusion and/or regulatory captures is well documented.

How do we get out of this dilemma? One way is to revisit the progress in theory. We now know better how to analyze the issues related to the presence of information asymmetries in SOEs as well as in private operations of the infrastructure sector. To improve our understanding of these issues and draw new insights and lessons on the design of infrastructure SOE reforms, a good starting point is to explore the main incentive problems and constraints underlying the design of

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[4] See Nellis (2006).

infrastructure SOE reforms. Although traditional wisdom and practical anecdotes tend to favor privatization over state ownership, economic theory does not seem to provide clear-cut arguments in favor of private ownership (see Box 1).

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Box 1

The irrelevance of ownership

Under complete information the early contribution by Barone (1908) proved the equivalence between the two ownership modes. More recently, Sappington and Stiglitz (1987) extended the equivalence result under asymmetric information.[5] However, the setting and the stringent assumptions under which the result holds, which include the possibility to enforce complete contracts, are hardly met in real world cases. This make the theoretical framework of limited practical relevance in the case of developing countries, where privatization and regulation opportunities are far from meeting these stringent conditions, since contracting opportunities may be severely limited, many events, risks and choices can hardly be *ex ante* fully anticipated, so that are not likely to be described and then enforced in contracts. Accordingly, practical approaches should be developed to take into account of informational and incentive issues, especially in the area of implementation. Yet, little work has been done beyond the normative assumptions, neglecting the relevant implementation issues.

Source: Vagliasindi (2007)

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In the standard normative assumptions used in the theory of public economics, the public sector has generally been modeled as a single benevolent planner with clear social objectives, a large set of feasible policy options to draw from, and full commitment abilities. In practice, SOEs strategic goals are difficult to define, due to the presence of multiple and sometimes conflicting objectives and multi principals; namely, different control organs within the public sector with different priorities and perceptions of what the strategic goals should be. SOE management finds itself accountable to and monitored by a shifting coalition of interest groups, consisting of politicians, bureaucrats, labor unions, and a plethora of other stakeholders.

Let us first consider the presence of multiple goals. The basic efficiency goals include providing services that consumers value and producing those services efficiently and at an affordable price. Productive and allocative efficiency cannot be reached by relying only on unregulated market forces, apart from very specific market structures (e.g. perfect competition) which are rarely found in the context of infrastructure service provision.[6] Namely, in the absence of regulation, a private monopoly would restrict the output (leading to too high prices) and provide a too low level of quality. On the other hand, guaranteeing allocative efficiency (in the theoretical case reaching marginal cost pricing) can require a substantial amount of public funds. This may lead to increasing

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[5] See the recent survey by Martimort (2006) deriving the conditions under which ownership does not matter under asymmetric information. Hart (2003) provides an excellent application of the theory of incomplete contracts and Martimort and San Zantman (2006) provides some interesting insights on the design of delegated management to public utilities. An earlier survey by Shirley and Walsh (2000) also shed some light on the debate in the theoretical and empirical literature on ownership. See Megginson (2001) for a review of the empirical literature on privatization.

[6] See Kirpatrick et al. (2004) for a review of why the water sector is one of the most problematic to be privatized in developing countries.

budget deficits, posing also a formidable challenge in term of fiscal policies and macroeconomic stability in developing countries.

Equity goals include ensuring universal access to services by, if necessary, charging tariffs below costs or extending service into unprofitable areas. SOEs are given additional developmental objectives, such as ensuring employment, creating necessary infrastructure for economic development, and so forth.[7] All over the world, but particularly in developing countries, prices have not been seen just as an instrument to reach purely allocative aims. Redistributive aims are often present especially with the aim of protecting the poor. Many economists would argue against the use of pricing to redistribute income, and consider progressive income taxation and welfare subsidies more effective means to redistribute incomes. Redistributive price distortions can, to some extent, damage the efficiency of the overall economic system.

Even if in principle all such objectives can be captured in the definition of social welfare and developmental goals, if goals cannot be clearly quantified specified, a good performance cannot be distinguished from a bad one. More importantly, SOE managers cannot be rewarded on the basis of performance. The problem is further complicated by the fact that SOE management does not face any credible threats for non-performance from the *external* environment in which it operates. Hence, we cannot limit to consider internal governance factors leading to SOE inefficiency, but we also need to take into account additional external governance factors. The threat of takeover or bankruptcy as an *ex ante* performance and monitoring instrument is non-existent. Barriers to exit have insulated the management of SOEs. Continued state-directed credit, equity injection and finance deficits have created perverse incentives for managers of SOEs and perpetuated soft-budget constraints.[8]

This leads us to consider how to improve the ***performance evaluation* and *monitoring*** of SOEs. In the absence of a robust performance evaluation it is hard, if not impossible, to provide incentives or delegate autonomy for SOEs. The problem with defining performance criteria for SOEs is due to the fact that some objectives (notably the developmental ones) are difficult to be quantified and that in many cases agreement is difficult to be reached on the tradeoffs. However, governments may want to consider evaluating a public enterprise in a similar way to a private one. Conventional *profit* measures risk being unfair as they fail to capture the additional equity objectives that the SOEs are asked to fulfill. The second best solution would be to revaluate the accounts using shadow pricing.[9] However, *shadow prices* are complex to be defined in practice. Governments can still consider following some simple guidelines. First of all, it is desirable for the performance evaluation to focus

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[7] In general the literature distinguishes between commercial and non-commercial goals, assuming implicitly that the commercial goals pursued by the private sector always lead to productive and allocative efficiency. As noted in the discussion above this may not necessarily be the case, unless we face a perfectly competitive market structure, a case that is not particularly relevant in the case of infrastructure. Here, to avoid any *ad hoc* assumptions on intrinsic efficiency connected to ownership, we find it more useful to distinguish between efficiency and equity goals.

[8] The relevance of soft budget constraints has been highlighted in the seminal contribution by Kornai. For a comprehensive survey of the issue see Kornai *et al.* (2003). Recent empirical studies attempted to disentangle the contribution of internal and external governance factor in driving SOE inefficiency in a number of developed countries. See Bartel and Harrison (2005) and Bertero and Rondi (2002), in the case of the US and Italy respectively.

[9] For a definition of public and private sector discount rates see Grout (2003).

on *trends* rather than levels. Second, it may be helpful to distinguish between the variables which are under the *control* of SOE managers (e.g., output, quality) and the ones on which SOE managers have little influence (e.g., prices if set up by the regulatory agency and or by the line ministries). Finally, in order to control for enterprise-specific constraints which affect the ability of SOEs to generate public profit, benchmarking can be adopted, exploiting the information coming from comparisons with similar firms elsewhere and/or comparisons based on professional judgments.[10]

Box 2
Managerial incentives and discretion

The literature on managerial incentive indicates the importance of firm types, uncertainty and technological complexity. In an agency relationship optimal incentive intensity should decrease with increasing uncertainty about the performance of the agent and increase with the responsiveness of performance to the agent's effort. Hence, the higher is the variability of firm performance the lower is the power of the incentive. Market competition makes firm performance highly responsive to the agent's effort because the firm will fail if its management shirks. In addition, competition reduces uncertainty associated with the agent's performance because competitive markets provide more information about the firm environment. As a result, shirking is easier to detect and the manager's performance can be measured with higher precision in more competitive firms. Therefore, managerial compensation should be more responsive to firm performance in competitive environments (this might be applicable to some selected infrastructure sectors, such as telecoms). If contracts do not specify each and every conceivable contingency, the allocation of residual control rights matters. The incomplete contract literature indicates that the optimal design of contracts should take account of the informational advantages, the abilities, and the incentives of the different parties. Delegating control to the party with superior information makes decision making better. The informational advantage of managers is greater in technologically more complex firms. Hence, managers of firms with more complex technologies should have more discretion. In addition, a larger firm produces products of greater strategic importance and the political support of SOEs with more employees is more important to the government. Hence, the need for direct government control is greater on larger firms to avoid significant transaction costs. Only a handful number of empirical papers have tried to test these theoretical hypotheses (for a notable exception see Bai *et al.*, 2005).

Regarding the treatment of equity objectives, one may solve the problem by removing such objectives and transferring them to separate public institutions, leaving SOEs to operate according to pure efficiency criteria. If this is not feasible, it is necessary to quantify the costs and benefits of meeting equity objectives and enter them explicitly in the *accounting* system. One solution could be to allow the enterprise to earn an extra profit on the difference between benefits and costs or to compensate the enterprise for the costs of meeting equity objectives. Similar adjustments can also be undertaken to deal with non-market prices of major inputs or outputs. A relevant option to consider here is the enterprise to be compensated (or penalized) by associated subsidy (tax) combinations. In this way, public profit would reflect the real economic surplus generated by the SOEs and managers can be rewarded according to their real contribution to enhancing social welfare. Box 2 provides some insights on how we expect managers to responds to incentive and on the desirability of providing them with discretion.

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[10] For some additional recommendation see Jones (1991).

3. Corporatization

Corporatization is designed to strengthen the enterprise's autonomy, through a separate statutory authority, with a distinct legal identity, separate accounts and its own board of directors.[11] Full corporatization requires the enterprise to be incorporated under the same laws that govern private corporations, some of which it was previously exempted. The experience of developed countries suggests that corporatization alone is a necessary but not sufficient condition to insulate the public enterprise from political pressures (see Box 3). The degree of autonomy enjoyed by the firm seems to depend on the rules of governance between the ministers and the SOE executives. But while corporatization does not necessarily resolve the conflicts between the efficiency and equity goals, it at least separates the accounts of the enterprise from those of the ministry, a necessary first step in public sector reform.

Box 3
Corporatization: the British experience

The early nationalization statutes of 1945 to 1951 gave the boards of directors of British SOEs substantial independence from ministerial interference, a concession made also to help winning private sector trust. Ministers could appoint the board members and set their salaries, but could dismiss them only for certain restricted reasons. Board members were obliged to consider ministerial advice on how to interpret the concept of "public interest", although that provision was rarely used (notably because the advice had to be in writing and defended in detail). The Treasury had to approve any borrowing by the nationalized firms, but the firms could invest from their own cash flow. Finally, the statutes also required the firms to breakeven but only on average, a loophole that make it possible to deliberately incur deficits. It is generally believed that the boards enjoyed substantial autonomy under this system, despite their frequent complaints of political interference. This might seem surprising, especially for enterprises like British Rail that were highly dependent on external financing from the Treasury. For example, British Rail board chairmen often fended off proposed financing cuts by warning, in public if need be, that the cuts would lead to dangerous reductions in the level of investment. Uncooperative board members could be replaced only when their terms expired. Moreover, ministers tended to change much more rapidly than boards, and most new ministers arrived with little knowledge of the firm. Most boards were also smart enough to yield to or ignore some ministerial requests.

An advantage of corporatization is improved information about enterprise performance. Britain's public corporations were created by nationalizing private corporations, and the quality of information may have actually declined in the process because the nationalization statutes did not hold the public corporations to the same strict accounting and reporting standards that apply to private corporations. In developing countries, by contrast, government-owned corporations are often created by hiving off the commercial activities from regular government departments. This separation of legal identities, and presumably of accounts, should make it easier to monitor the enterprise's performance than it was when the enterprise was buried inside the department. But if additional information is a key advantage, then developing countries should not make Britain's mistake of failing to establish clear reporting and accounting standards for the new public enterprises. The

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[11] Corporatization is one of the alternative options to improve SOE performance short of privatization. See Gomez-Ibanez (2007) for an excellent stock taking exercise and Irwin and Yamamoto (2004) for more specific recommendations in the electricity sector.

easiest course of action may be to incorporate the public firms under the same laws that govern private corporations, since those laws typically apply fairly strict reporting standards. A more complex, but more desirable option would be to follow the key principles underlying the recently designed OECD guidelines to enhance transparency and accountability of the infrastructure sectors, as reported in Annex 1.

There are few studies from developing countries of the effects of corporatization alone, in isolation from additional reforms, including the introduction of performance contracts, privatization or other measures.[12] The few reports on the subject cite several examples where corporatization was thought to have improved performance. However, these reports also include warnings that corporatization can take many years to be successfully implemented. Why was corporatization effective? The empirical evidence suggests that by structuring the internal governance system of SOEs according to that of a modern corporation, corporatization may enhance efficiency through better monitoring of managers, improvements in information-sharing channels, and a reduction in governmental political intervention. It may also affect the incentives and objectives of managers by tightly linking enterprise performance with the evaluation and remuneration of managers. It may also impact, positively or negatively, on the soft budget constraint faced by SOEs. On the one hand, the government may want to force corporatized firms to face greater competition and to increase the efficiency of credit allocation to SOEs. On the other hand, the government has strong incentives to provide financial support to such firms and to prevent their bankruptcy because of the heavy political and social costs that would be involved. Since there are numerous channels through which corporatization could potentially affect the performance of SOEs, it is extremely difficult to separate the effect of each channel.

The sources of efficiency engendered by corporatization can be traced to the reform of the internal governance structure of these firms. The empirical results reported in Aivazian *et al.* (2005) indicate that, even without privatization, corporate governance reform is potentially an effective way of improving the performance of SOEs; such reforms represent a policy alternative for countries seeking to improve SOE performance short of privatization. The evidence showed that corporatization has been effective in improving the profitability and efficiency of SOEs, and that corporatization indeed changed the internal governance system of SOEs in significant ways. Aside from introducing a board of directors and a CEO, each corporatized firm was more likely to set up a board of supervisors and an independent finance department with its own budget. Furthermore, through corporatization, some decision powers previously undertaken by government authorities shifted to an internal governance system, such as the firm's board of directors, and government political intervention through the dominant parties and personnel department have been significantly reduced. These results suggest that the restructuring of the internal governance system of SOEs could be a source of improved performance. However, the empirical results also suggest that some problems still persist after corporatization, such as the one posed by pervasive soft budget constraints and government interference, so that further restructuring of SOEs may be necessary. An important related issue is the extent to which privatization could solve these problems and improve SOE performance. Also, the effectiveness of SOE restructuring, whether via corporatization or privatization, may hinge on such additional factors as changes in the structure of markets, the legal

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[12] There is mixed evidence on the impact of listing of previously corporatized SOEs. See, among others, Bai *et al.* (2005); Ferguson *et al.* (2002); McGuiness and Ferguson (2005) and Zhang (2004).

system, and even in culture. This points once again to the need to tackle at the same time internal and external governance factors, as argued earlier.

4. Ownership organization and holding structures for OECD countries

The organization of the exercise of ownership function within the state administration varies across OECD countries. Notably, the degree of variation has been very much dependent on the traditional administrative organization, the significance of the state sector in the economy prior to the privatization waves, as well as recent reforms carried out in regulation and the management of state-owned assets.

Three main types of organizations dominated across the OECD countries: the decentralized or sector model, the dual model and the centralized model. The decentralized model is the one where SOEs are under the responsibility of relevant sector ministries. The dual model is the one where the responsibility is shared between the sector ministry and a "central" Ministry or entity, usually the Finance Ministry or the Treasury. Finally, the centralized model, in which the ownership responsibility is concentrated under one main ministry, has been on the increase more recently.

The evolution and reform of the organization of the ownership function have been ongoing in the last decade. These reforms tend to move countries away from the decentralized model and more towards the centralized model, although a few countries seem to have developed a fairly stable dual model of organization. In what follows the various organizational models will be briefly examined, highlighting some of the advantages and disadvantages of each of them.

The **decentralized or sector model** is the most traditional one. This model of ownership function still exists today in a few OECD countries, such as Finland and to a less extent Germany. In Finland, 9 different ministries exercise the ownership function over 50 SOEs. In the UK (up to 2003), the ownership function was historically dispersed among a wide number of ministries, and is now under the responsibility of 9 different Departments, Ministries or Offices. In some cases, a specific ministry plays a coordinating role, in addition to the main role played by sector ministries, and is in charge of elaborating the overall ownership policy as well as specific guidelines. The main advantages and rationale for such a decentralized organization are due to the much greater availability of sector expertise. The main drawbacks resulting from such an organization are the difficulty in clearly separating the ownership function from the regulatory role and the risks of governmental interference in day-to-day operational functions.

The **dual model** used to be the most common and is still adopted in many OECD countries, including Greece, Italy, Korea and New Zealand. In the dual model both sector ministries and a "common" ministry are responsible for exercising ownership rights. The "common" Ministry is usually the Ministry of Finance (or the Ministry of Economy and Finance), due to the importance of the SOE sector to the state's overall economic and financial objectives. Both ministries may have the right to nominate representatives for the board of directors. Dual responsibilities often also include the approval of major transactions and strategic plans. In some cases (e.g. New Zealand) dual responsibility is directly reflected in the ownership, with the sector ministry and the common ministry each owning half of the state's shares in SOEs. The common Minister is often directly in charge of some specific ownership functions. This may be the nomination of board members, or aggregate reporting (i.e. reporting about the whole set of state-owned enterprises). This specific

function may nevertheless be carried out in coordination or in consultation with the respective sector ministries. In most countries the dual organization was the result of the growing power and importance of the Ministry of Finance.

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Box 4
The case of Korea

In Korea, the organization is even more complex than the basic dual model, as it involves at least three ministries in exercising the ownership rights in the so called GOCs (government owned corporations. The sector ministry or the Ministry of Finance and Economy represents the state in the General Shareholding Meetings. The sector Ministry proposes a board chair and appoints "full-time" (i.e. executive) board members. The Ministry of Budget and Planning appoints outside directors of GOCs, monitor their performance and proposes an auditor, in consultation with the Ministry of Finance and Economy. The Board of Audit and Inspection audits GOCs.

Besides reporting almost the same way as private companies, GOCs also have to submit a special report, called the "Report on Actual Results of Operation" with financial and non-financial information on the achievement of their objectives, as well as "concerns of public interest". This special report has to be submitted to all the supervision entities concerned, i.e. the sector Ministry, the Ministry of Planning and Budget and the Ministry of Finance and Economy, as well as to the National Assembly.

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An important potential advantage of the dual model is that it can alleviate the conflict of interest that the government typically has in its dual role as both the owner of an SOE and the representative of that SOE's customers. When these two roles are divided between the two ministries, the competing constituencies are introduced into the corporate governance framework and are likely to subject corporate policy to more rigorous checks and balances than would a single government ministry.

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Box 5
The Australian and New Zealand models

In Australia, the 1997 Governance Arrangements for Commonwealth Government Business Enterprises set out principles related to the arrangements for joint Shareholder Ministers. The Ministry of Finance and Administration "generally takes a lead role in (SOEs)' financial matters, with the portfolio Minister focusing on operational issues". In New Zealand, the underlying rationale for the division of responsibilities between the Ministry of Finance on one hand, and the sector Ministries and the Advising Unit on the other hand (CCMAU, Crown Company Management Advisory Unit), is quite similar and is clearly articulated. The Ministry of Finance focuses on both economic efficiency and the fiscal impact of SOEs' performance. Therefore it takes the lead for financial reporting, economic and divestment issues and has the sole responsibility for approving asset sales. Sector Ministries (through the Advising Unit CCMAU) adopt a commercially oriented perspective with a primary emphasis on ensuring that SOEs are successful companies. Therefore, through the CCMAU, sector Ministries take the lead in monitoring performance and have sole responsibility for board composition.

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In a few countries this dual organization has been very carefully designed (see Box 5). Another potential advantage of the dual model is that facilitates both technical (from the officials of a sectoral ministry) and fiscal oversight (from the Ministry of Finance, or perhaps a ministry of public enterprises). The main disadvantages of the dual model, especially in a country where it is not a traditional governance arrangement, are the potential for the blurring of responsibilities between the

two ministries involved, and the possibility that SOE management perceives itself to be "the servant of two masters", with detrimental results for morale and performance.

The **centralized model** has often resulted from the recent implementation of privatization programs. In this model, most SOEs are put under the responsibility of one Ministry or Agency. In most cases this is the Ministry of Finance (Denmark, the Netherlands, Spain) or the Ministry of Industry (Norway and Sweden), which used to have the most important SOEs under its responsibility in the previous model of sector ministry organization. In Belgium, there is a specific ministry, the Ministry of State-Owned Enterprises and Participations. In a few cases a specific Agency has been established, and this Agency is more or less autonomous, usually reporting once again to the Ministry of Finance (as in the case of France).

The main advantages of the centralized model are the clear line of accountability from the SOE to the government, the ability of the government to exert close fiscal supervision and to form a coherent SOE policy, and the fact that it allows the best use of the typically limited human resources available within the civil service to undertake the specialized job of exercising the government's ownership function. The main disadvantage is the likelihood that the depth of sectoral expertise available in a Ministry of Finance, for example, will be shallower than in sectoral ministries.

The OECD's recommended model is for a centralized ownership function, for the reasons highlighted above. The OECD goes even further in recommending the centralized ownership to be exercised by an independent agency, even though this model is relatively untested in practice both in developed and developing countries.

Finally a special organizational model is based on **holdings** to which the ownership of specific lists of SOEs has been transferred. These holdings are in turn owned by the state and under the responsibility of one Ministry. This holding model has often resulted from reforms undertaken in the 1970s, aimed at decreasing political interference in the management of SOEs, giving more flexibility to their management, and introducing tougher budget constraints. In Italy, the IRI holding company was also set up to support the development of the southern region and to rescue distressed companies.

This holding model is not frequent and has shown its limitations. It has not proven to be efficient either in terms of corporate restructuring or in financial management, and not even for regional development in the Italian case. Apart from some of the former transition economies, only Austria still retains this holding organization with the ÖIAG that controls a significant number of SOEs and is the privatization agency for the Austrian Republic. In this sense, the Austrian model is closer to a centralized model. The main advantage of the holding model is the fact that it can be used to facilitate a nationwide program for the privatization and restructuring of state-owned industry. Its major disadvantage is that it does not by itself resolve the basic issues of poor corporate governance of SOEs. Instead, it simply relocates the problem to the level of the holding company. The question then becomes how efficient and accountable the holding company is, and whether a centralized, decentralized, or dual system of corporate governance should be adopted to improve its performance.

Below we provide a simple theoretical framework to analyze these models, followed by an overview of which models have been so far dominant across developing countries and in which conditions they worked well.

5. Which model to recommend for infrastructure sectors in developing countries?

In developing countries, there are at least two key considerations that policy makers may want to take into account when designing institutional arrangements for the ownership function. First, the optimal volume of infrastructure investment cannot be assessed separately from the other general objectives, in light of the presence of a limited fiscal space. Second, the fiscal impact of the myriad explicit and implicit forms of subsidies may require close oversight and monitoring. Let us review in turn the existing literature in both areas.

The core of the fiscal space debate is about the importance of the design of macroeconomic fiscal adjustment programs for the level of investment in infrastructure. Fiscal rules adopted to ensure debt sustainability as part of standard IMF macroeconomic adjustment programs are increasingly being criticized as excessively binding constraints. Moreover, there is widespread concern that these rules may permanently reduce the public sector's contribution to capital accumulation, particularly in infrastructure. Whereas this debate has been quite intense in Europe as part of the assessment of the Stability Pact (see Buiter and Graf, 2004 for a comprehensive overview), it is relatively new in developing countries.

Despite the relevance of the design of a financing mechanism and the ownership and monitoring regime for SOEs, there is little new theoretical infrastructure-specific literature on these topics. In what follows, we will summarize the key lessons coming from the theoretical modeling of the different ownership arrangements, based on the framework developed by Vagliasindi (2007), once we account for the presence of binding budget constraints and introduce in the analysis the cost of public funds. The underlying idea behind the cost of public funds is simple: in practice each dollar spent by the government is raised through distortionary taxes and its cost to society equals the dollar spent plus the shadow cost of raising public funds.

Let us rely on the theoretical goal of social welfare maximization in order to analyze the conditions under which different SOE governance arrangements can suit developing countries, taking into account the presence of a limited fiscal space. In a simple setting we have a unique shadow cost of public fund, equal for any single tax yield and any public firm revenue coming from the solution of the social welfare maximization problem. In practice, under different governance arrangements the nature and the level of the cost of public funds may be different. Under a centralized ownership function, the cost of public fund is given by economy wide tax data and is independent from the financing issues of the infrastructure sector under consideration, as long as the latter is small relative to the economy. Under a decentralized ownership function, the shadow cost of public fund is only dependent of the financing issues restricted to the infrastructure sector, excluding the distortionary effects that this provokes to the other sectors in the economy. The divergence between the costs of public funds can be determined by several factors, such as the absence of a sufficient level of transfers from the public budget to cover costs. Different governance models are also associated with different tariff levels, as well as different quality enhancing and cost reduction activities. Higher levels of mark-up (and distortion) are associated with decreasing deficits (transfers) to the firm budget. This in turn implies higher price mark up and lower cost reduction and quality enhancing activities.

From a purely theoretical perspective it is difficult to provide strong guidance for the preference of one of the governance model against the others. If the policy makers are mainly concerned with allocative efficiency, the governance model which minimizes distortionary costs is the centralized one where the Ministry of Finance exercises the ownership function for the overall

economy. The centralized model where an independent agency monitors all SOEs is likely to come next in ranking according to this criterion, but it poses formidable challenges on several fronts. First, it is based on the use of cross subsidies (which may bring undesirable consequences, including opportunism) from more profitable SOEs towards loss making ones. Second, it ignores the interaction of SOEs with the fiscal and public expenditure policies. The dual model only focuses on infrastructure SOEs, but it partially takes into account the impact of infrastructure on fiscal policy. Finally, the decentralized model where the Line Ministry exercises the ownership function totally ignores the fiscal impact of infrastructure on the rest of the economy.

However, other considerations, including incentivizing cost reduction and quality enhancing activities may dominate allocative efficiency considerations in the policy maker's priorities. In this case, the policy maker provides the Line Ministry and SOEs with incentives to increase productive efficiency, as far as the Line Ministry is the residual claimant, but the quality is likely to be lower. The main drawback is that this model displays less flexibility to changes in parameters, so that it is likely to involve costly review processes needed to modify the constraint to the changing targets set by the policy-maker. On the other hand, the centralized solution leaves the Ministry of Finance free to fix the deficit level (depending on the general situation of the public budget) and, hence implies lower incentives to improve productive efficiency, but the quality is likely to be higher.

6. Evidence in developing countries

6.1 The decentralized model

The **decentralized or sector organization,** where the Line Ministry exercises the ownership function, was the most prevalent model used in Eastern European countries, such as the Czech Republic, Poland and Hungary, prior to their transition to a market economy, and it is prevalent in developing countries across many regions.

What are the disadvantages of decentralized models in developing countries? Some of the drawbacks are similar to the ones that characterize developed countries, including the greater difficulty in clearly separating the ownership function from the regulatory role and the risks of governmental interference in day-to-day operations. Such drawbacks can become so strong in developing countries to make the Board perceived to fulfill purely a political role rather than a professional one, as Box 6 reports, based on the experience from Bosnia and Herzegovina (BiH) and Zambia.

6.2 Centralized model – Ministry of Finance/Treasury

The **centralized model** has often resulted from the implementation of privatization programs. In practice it is hard to find an example of a completely centralized system of corporate supervision of SOEs. The Polish case, which is often referred to as one of the best practice example of centralization, although the law confers the general competence for the exercise of the state's ownership function on the Ministry of State Treasury (MoST), there are significant statutory exceptions. The law and the MoST Guidelines indicate two significant factors in the exercise of the ownership function by the State.

Box 6
Decentralized models: the cases of Bosnia and Herzegovina (BIH) and Zambia

In BiH, corporatisation was slow process, partly as a result of the challenge of producing inventories of assets and liabilities for the successor utilities. The utilities were initially chartered under special sectoral legislation, but later transformed into government-owned joint stock companies under company laws mandating a dual board structure. In both entities of BiH, in the case of the power utilities it was the Ministry of Energy which was responsible for representing the government's ownership interest, with the Minister or Assistant of Energy sitting as Chairman of the utilities' Supervisory Boards. In theory, members of Supervisory Boards have employment contracts with the company, and can only be removed with due cause. In practice, all members of Supervisory Boards, at all levels of government, are replaced when a new government takes office. This reinforces the perception that Supervisory Boards fulfill a political or regulatory role, the goals of which are set by the government in office; rather than a professional one, the goal of which is to ensure that the utility is operated as a going concern. Also in the case of Zambia, Ministers and boards of utilities and of regulators come and go.

In Zambia several attempts to privatize infrastructure utilities including the electricity vertically integrated company ZESCO were abandoned, due to both to global changes in the appetite of strategic players and a growing domestic opposition to private sector involvement. The Commercialization strategy encompassed the revision of legal provisions of ZESCO, including an amendment to ZESCO's Articles of Association and the composition of its Board to ensure independence from political interference and to provide a mandate to operate on commercial principles. In spite of the progress in commercialization, the utilities' Boards of Directors do not exert the most important influence on the company. The crucial oversight relationships are not between the utility and its formal government and regulatory overseers – but between the chief executive of the utility and the office of the President. In electricity, the same individual was chief executive of ZESCO, the dominant vertically integrated electricity utility throughout the ten-year Chiluba era. President Mwanawasa followed a similar pattern by appointing a trusted confidante as successor. In telecommunications, President Mwanawasa also appointed a new and trusted chief executive of Zamtel upon acceding to power. When the Chair of the board of the regulatory agency unilaterally fired him, within days, the board of the regulatory agency was dissolved.

Source: Martin and Cox (2004) Vagliasindi and Verbeek (2008)

The first factor is the size of the shareholding of the State (whether the state holds a majority or minority share in the company). There are separate sets of MoST Principles for supervisory board members of wholly, majority and minority state-owned SOEs. The second factor is whether the company's operations focus on strategic sectors of the economy (e.g. the energy sector). In the case of strategic sectors, the exercise of ownership rights is done in consultation with the sectoral ministries (see Box 7).

The Polish case provides useful lessons, in many respects. In the case of manufacturing enterprises it highlights the advantages of the centralized model in monitoring SOE performance and governance. In the case of infrastructure SOEs, it provides strong evidence of the difficulty of applying a purely centralized model, since infrastructure service providers are considered as "strategic" enterprises, not subject to the same governance arrangement as other SOEs.

In Poland, SOEs are subject to a series of additional disclosure requirements above those set forth in the Company Law. The MoST prepares specific guidelines on financial reporting on an annual basis to explain and clarify all these requirements. SOEs have to prepare detailed reports on management board activity, plus a report on their activity in the previous financial year, and a report on the result of the examination of financial reports. Moreover, a special Quarterly Report has to be approved by the Supervisory Board and submitted to the Treasury, giving information on the financial situation, the remuneration of employees, financial credibility and potential risks. Another Quarterly Report on guarantees granted has to be submitted to the Ministry of Finance. In Poland, the MoST prepares the "Report on economic and financial conditions of SOEs", which is communicated to the government and parliamentary committees concerned. Moreover, it is posted on the MoST's Web site. The MoST Principles lay down the instruments of ownership supervision, focusing on the criteria and the methods of supervision together with a comprehensive set of regulations, rules, and procedures of MoST corporate supervision and the selection of members of supervisory boards who have adequate preparation to provide effective corporate supervision. Fields of expertise for candidates wanting to be Treasury representatives on SOEs' Supervisory Boards include: Legal: Civil Code, Commercial Company Code, Labour Code, Bankruptcy Law and court conciliation procedures, commercialisation and privatization procedures Corporate governance: role of boards, GSMs Business: management, marketing, business plans, accounting, corporate finance, valuation methods, restructuring, state aid for enterprises. Those who pass the exam receive a special certificate and are registered in a database. The database presently includes 35,000 names for 5,000 positions as of 2005. The Treasury organizes training for SOE board members in economics, law and corporate governance issues and one meeting a year on the guidelines about how to present financial reports.

The MoST Principles contain no information about the ownership supervision policy with respect to the SOEs supervised by ministries other than the MoST, such as the Ministry of Infrastructure (the Polish Railways, the Polish Post, the Polish Airports) and other infrastructure sectors (e.g. energy). In addition, the Polish Golden Veto Act provides for the special right of the state to veto certain key decisions in strategic companies. Pursuant to the Golden Veto Act, the MoST prepares and annually updates a list of companies of strategic significance for the state in the energy, telecommunication infrastructure and railways sectors. In those companies, the state, regardless of the size of shareholdings but provided that the state is a shareholder, has the right to monitor and veto key corporate decisions: sale of substantial assets, change of corporate goals, relocation of the company headquarters outside the borders of Poland, and dissolution of the company. In those companies, the Government has the right to appoint so-called observers, who should be provided with complete access to company's information on issues significant for the public interest.

6.3 Centralized model – Independent Agency

The centralized model where an independent agency is in change of SOEs is relatively untested also in developing countries. With the exception of Kosovo, which represents a special case, as the administration of Publicly Owned Enterprises (POEs) is currently a power reserved to UNMIK, (see Box 8), there are virtually no real life examples. The Kosovo case reinforces the lessons from the Polish case in that they confirm the challenges of applying a centralized model to the case of infrastructure. It also highlights potential misalignments of incentives coming from the introduction of an independent agency – not accountable for fiscal impact and provision of subsidies - to exercise the ownership function.

Box 8

Centralized models with an independent agency: the case of Kosovo

The Kosovo Trust Agency (KTA) was established in 2002 as an autonomous agency to which these powers were delegated. The mandate of KTA is to "administer enterprises as trustee for their owners" and to "carry out ancillary activities to preserve or enhance the value, viability and governance of Enterprises". The current legislation does not allow for the privatization of the POEs. The current institutional framework of the public enterprise sector generates a complicated set of incentives which are generally not conducive to the efficient operation of the POEs. On the one hand the Provisional Institutions of Self Government (PISG), which are responsible for fiscal outcomes, have little control over the POEs. On the other is the KTA, which has control over the POEs, but is not accountable for their fiscal impact. The PISG are under constant pressure from the public to improve the performance of the POEs. Being statutorily unable to do so – since they can neither appoint POE management nor decide on the disposal of profits or allocation of subsidies - the PISG are tempted to side with the general public against the KTA and the management of the POEs. The fact that the senior management of the POEs has been made up of foreign contractors has only increased this temptation. Overall, the current system led to a conflictual relationship between the POEs and the PISG which practically precludes the type of co-operation required to resolve the problem of the substantial fiscal burden represented by the public enterprise sector.

What have been the implications of such a misalignment of incentives under a centralized structure for the two key energy and telecom sectors? The energy sector challenges call on enhanced transparency and effectiveness in the transfer of funds from KCB (particularly in situation of emergency) and a more accurate forecasting of needs from POEs. The ultimate objective is to gradually reduce the electricity utility KEK's reliance on subsidies. KEK's lack of creditworthiness – deriving ultimately from its very low level of billings and collections – means that any critical financing needs will in effect constitute calls on the KCB. The new regime introduced in 2006 through Monitoring and Control Agreements with POEs, allows for KSB funds to be transferred to POEs on a quarterly basis for operational shortfall. The need for increased efficiency in public expenditures is reinforced by the fact that around 25% funds transferred to POEs were unspent, due to reductions in projects and delays in procurement. Another challenge comes from the annual cash basis according to which the budget is operated, which makes reallocations of funds extremely cumbersome. PTK - the other main POE, in terms of capitalization and turnover – is on the other hand a highly profitable company – though this is not an unequivocal indicator of efficient performance. Ironically, PTK's profitability poses also major challenges for the fiscal position of Kosovo, because of the asymmetry of the impact of the losses and profits of the POEs on the KCB. Whereas KEK's financial losses are absorbed by the KCB, no part of PTK's profits were. PTK was only allowed to declare dividends for 2005 and 2006. Moreover, PTK will also provide a loan to KEK under a special trust fund administered by the Treasury.

Source: Vagliasindi (2008)

6.4 Dual Model

The **dual model** used to be the most common and is still adopted in many developing countries, including Mexico, South Africa and Turkey. There may be a dual responsibility about certain specific aspects, for example, where both ministries have the right to nominate representatives for the board of directors. This is the case in Mexico, where representatives from both the Ministry of Finance and from the sector ministries or agencies sit on the board of majority state-owned companies. The main disadvantages of a dual model that we have seen in our stylized review, coming from the multi-principal agency problem, are amplified especially in developing countries not characterized by strong governance arrangements and respect of law. Such problems could be particularly strong at the subnational level (see Box 9).

The analytical framework of "government competition" encompasses current models of Chinese local government like the "developmental" or "entrepreneurial state" as special cases. This competition is conceived as a complex system of formal and informal institutions undergoing endogenous change. Rooted in historically determined institutions like the regional property rights system in local resources, the system evolves through political entrepreneurship crafting competitive strategies and institutional innovations. The peculiar features of Chinese local government deviates from centrally imposed formal institutions. They are defining features of the institutional framework of government competition in China, in which the central government is only one player. First, a critical vulnerability of the existing governance framework is the ambiguous nature of the relationship between the local government and development agents (including UDICs). This may pose risks of over-leverage and possible crowding out of private enterprises resulting from the privileged borrowing position of UDICs, and/or in the long run, higher default rates. Other vulnerabilities include the fuzzy relationship between the central government and the local UDICs, as well as the relationship between the central and the local governments.

In 2000/01, the City of Johannesburg in South Africa, as part of a broader initiative to reform local government, established Johannesburg Water (Pty) Ltd as a government owned company. The Articles of Association and by-laws of the company set out the objectives and expectations of the municipality as the sole owner of the company. The ownership role within the municipality was initially with the Department of Finance but subsequently a Shareholder Support Unit (SSU) was created in the Office of the City Manager. Thus, whilst the municipality retains a triple role of policy maker, owner and regulator, it has gone some way to clarify and separate these roles. The ownership role lies with the SSU, much of the regulation role has been passed to the Contract Management Unit, established within the municipality to oversee all the municipal service entities (although the municipal council still agrees the tariffs), while the council retains its policy making role. Through this separation each party can focus on the implementation of its assigned responsibility. While the municipal council has ultimate veto over the actions of the CMU and the SSU, the parties have maintained the separation of powers as envisaged in the reform process.

The experience in China confirms the drawbacks of decentralized models, particularly coming from the multi-principal agency issues at the subnational level. What can be done to further mitigate such problems? As the South African case has shown, separation of ownership and regulatory function can help. Additional mechanisms include the use of performance contracts and/or code of corporate governance. These will be examined in Section 7.

7. Governance arrangements

Objectives are usually set in a "top-down" manner, with government setting the priorities for ministries and government objectives being disseminated within each organization and each level of organization by top managers and line managers. There are generally four kinds of targets used in performance measurement: *i)* policy priorities directed to achieving long-term outcomes; *ii)* strategic goals, intermediate outcomes or high level outputs; *iii)* measures or standards of service quality, often as part of organizational performance agreements, or as stand alone performance contracts for individuals; *iv)* annual targets, including specification of outputs, processes, management targets (staffing, training, IT use), financial targets, efficiency and productivity targets, and possibly customer service targets.

Some countries have developed formal contractual relationships between the most senior officials and ministries in order to reinforce accountability but also to bridge the political/administrative interface. This has occurred in some position-based systems and in countries with a long agency tradition, like Australia, Denmark, New Zealand, Norway or Sweden.

There have been two main types of governance agreements:

- *Organizational performance agreements:* negotiated agreements between the minister and chief executive or between the chief executive and senior managers within the department or agency, which break down overall strategic goals into program elements, setting specific, often detailed, operational, procedural and output oriented targets.

- *Individual performance agreements:* these may take the form of a non-legally binding written agreement as part of an annual performance appraisal and goal setting, or be part of an employment contract process, regarding the work to be carried out over the coming year. Regardless of the format, performance agreements are generally evaluated and negotiated on an annual basis.

The most basic organizational performance agreement was an explicit statement of the targets that the managers were to be held responsible for and of the autonomy and financial support that the government would provide in return. Often this statement took the form of a performance contract that was negotiated periodically between the managers and ministry officials that supervised the SOEs. Performance contracts originated in France in the 1960s and spread rapidly, and in many variants, among industrialized and developing countries.

The experience with performance contracts in the 1970s and 1980s revealed a number of problems.[13] Some of them were technical in nature and can be to some extent mitigated by careful design of the contract. For instance, many contracts had to be renegotiated because they failed to anticipate important events and provide contingencies for them. In other cases SOE managers typically knew more than ministry officials about the opportunities to improve SOE performance and used their inside information to negotiate easy targets.

A more difficult problem arising from performance contracts is coming from the temptation of governments to renege on their obligations. Governments often reneged on commitments to SOEs, particularly those involving sensitive pricing or service decisions or promises of budgetary support for socially worthwhile but less profitable activities. The problem was that the performance agreement did not represent a real resolution of the enterprises conflicting and unrealistic goals. Government officials wanted an efficient and profitable enterprise, but they also still wanted lower prices, more services and higher staffing than could be supported by commercial operation. The reneging often made managers skeptical about the advantages of negotiating agreements and undermined their sense of responsibility for complying with their part of the bargain.

There are, however, a few successful cases of performance contracts, a common feature of which is simplicity and specificities of objectives and alignment between external and internal incentives. In the case of Uganda, the NWSC Act of 1995 provides the water utility a degree of autonomy, with more autonomy transferred to the Area Service Providers. NWSC initiated internal performance based contracts with Area Service Providers, whereas at the same time, the Government

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[13] See Shirley and Xu (1997).

of Uganda introduced a performance contract with NWSC to increase accountability for results and to provide the utility with incentives for good performance (see Box 10).

Box 10
Performance agreement for NWSC (Uganda)

From February 1999 onwards the management of NWSC has sequentially implemented a number of programs. More autonomy was transferred to the Area Service Providers ('Areas"), along with defined performance targets and accountability for results. The "100-Days Program" and the "Service and Revenue Enhancement Programs" resulted in better specification of targets for the Area Service Providers. These programs also increased commitment from the Head Office to provide logistics to enable different Areas to implement programs. In 2002, automatic tariff indexation was introduced. In addition the "Stretch-Out Program" resulted in a higher level of staff commitment by improving internal communication and setting tougher performance targets and corresponding incentives. A "One-Minute Management" was introduced to further enhance individual staff's accountability for achieving targets. In 2000, the Government of Uganda (GoU) introduced a three-year Performance Contract (PC1) with NWSC. NWSC's debt service obligations were suspended in return for a commitment to operational and financial improvements and an increase in coverage which reflected GoU policy objectives. A 2003 second Performance Contract (PC2) continued suspension of debt service and specified that NWSC's debt would be restructured to a sustainable level. The implementation of the agreement was monitored by a review committee. The main sanction of the agreements is in the forms of bonuses for managers and staff.

Source: Baietti et al (2006).

It is worth to put a cautionary note on the adoption of performance based reforms in developing countries that have not first implemented basic budgetary and public expenditure management reforms.[14]

In terms of individual performance agreements, the most important performance criteria used in OECD countries include achievement of objectives; competencies and technical skills; interpersonal skills and teamwork; leadership and management skills; and inputs.[15] Box 11 reports the informative example of performance agreements for senior civil servants in the United Kingdom. The UK system has been successful in that it allowed the introduction of powerful incentives for senior civil servants, based on objective criteria as in private enterprises, where good performers are rewarded by performance related pay, whereas poor performers can be dismissed if the poor performance is persistent, even after an agreed improvement plan.

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[14] For an interesting discussion of the virtues of "best practice" vis-à-vis "basic first" approach see Andrews (2006).

[15] See Whitford (2006) for a comprehensive review of the issue of incentives and tournaments in public administrations.

Finally, there have been a number of innovative proposals to apply tariff regulation to SOEs. This approach, pioneered by Chile, is to subject government-owned infrastructure and utility companies to the same kind of tariff regulation imposed on privately owned monopolies. Chile corporatized its publicly owned water companies and regulated them as if they were private monopolies beginning in 1989. Chile saw corporatization and regulation as steps to prepare the industry for eventual privatization. The Chilean system of utility regulation is unusual in that the procedures the regulatory agency must use are set out in law at a level of detail similar to a performance contract (for more details, see Gomez-Ibanez, 2003). Performance improved significantly, but not enough to prevent the government from privatizing the water companies. Chile's experience inspired the regulation of government-owned utilities in Australia, Scotland and South Africa. The Scottish case is reported in Box 12.

More generally, monitoring processes that are not backed by an institutional role specifically assigned to that task (i.e., a regulatory body), and so are undertaken within inner-government, tend not to be as transparent as regulatory processes. It is also easier to apply pressure on utility managers to improve performance if there is clear evidence of declining performance in the provision of operational and maintenance services through time arising from information being available for comparative purposes. The benefits of information and transparency should not be undervalued and can lead to considerable performance improvements.

Box 12

Increased transparency – the approach in Scotland

Scottish Water (SW) was established in 2002 as a publicly owned corporate body with a statutory responsibility to deliver water and sewerage services to around 2.2 million households and 130,000 businesses in Scotland. As sole shareholder, the Scottish Executive has the power to appoint the Board. It also sets output obligations and capital expenditure limits, and monitors performance.

SW is also subject to economic regulation from the Water Industry Commission for Scotland (WICS), which approves final tariffs independent of approval from the Scottish Executive.

The WICS has adopted a yardstick approach to setting allowed price, drawing on companies' performance in England and Wales (E&W) to establish SW's comparative efficiency level in order to set future efficiency targets. SW's The WIC also sets performance standards regarding customer, environmental and drinking water quality, which is referred to as the overall performance assessment (or OPA).

At the first review of charges in 2001 (which set charges for 2002-06), the WIC imposed an efficiency target of around one-third for both operating and capital expenditure to be realized over a four-year period. This target reduction was based on assessment of the efficiency gap between SW and the WIC's view of the most efficient water company in E&W. At the price review in 2005, which has set charges for the control period 2006-10, the regulatory stated that SW had broadly achieved the target reductions, for example, reducing opex from £365m in 2000/01 to £265m in 2005/06. Correspondingly staff numbers have declined from 5648 in 2001/02 to 4106 in 2004/05.7 SW has also achieved improvements in its OPA score.

The WIC has set similarly tough targets for efficiency improvements, as well as quality of service, for the current price control period, 2006-10. The WIC has also sought to address concerns about managerial incentives to achieve these targets in the absence of private shareholder equity. For the current review period, the shareholder – the Scottish Executive – has introduced a management incentive scheme, whereby senior management remuneration is linked to cost and quality performance targets set by the regulator at the recent price review.

8. Conclusions

The aim of this note was to revisit and shed some light on selected issues in the area of SOE performance evaluation and monitoring in the case of infrastructure sectors of developing countries. These issues have remained extremely important in light of the fact that a large proportion of infrastructure services are still delivered by SOEs in developing countries. Too many SOEs have been plagued by inefficiency and ineffectiveness as providers of infrastructure services, as well as instruments for economic and social developments. SOEs have been also facing continuing risks of political interference in governance and day-to-day operation, all of which have diverted them from fulfilling developmental goals. In deciding to continue to keep them under state ownership, government may want to give serious considerations to the need for reforming their internal and external governance and operations in such a way so that to ensure that they can pursue clear developmental objectives. A number of studies quantified that even a relatively small improvement in operational efficiency of SOE could release a significant amount of resources. Three key policy recommendations emerge from our review.

First, governments may want to consider spending as much time and effort *monitoring* the *performance* of public operators, as they would do for private operators. This can increase the

transparency and accountability of the infrastructure sectors and minimize costs in terms of foregone efficiency and inequitable outcomes to users and taxpayers. Conventional *profit* measures risk being unfair as they fail to capture the additional equity objectives that the SOEs are asked to fulfill. Governments can consider following some simple but effective guidelines, quantifying costs and benefits of meeting equity objectives and entering them explicitly in the *accounting* system, focusing on *trends* rather than levels, distinguishing between the variables which are under *control* by SOE managers and the ones on which SOE managers have little control.

Second, some of the structures implied in the OECD Principles of Corporate Governance for SOEs (e.g., favoring a centralized ownership function through an independent agency versus a decentralized or dual structure) have not yet been sufficiently "tested" in practice and may not suit all developing countries. Developing countries are characterized by tight budget constraints that need to be taken into account when it comes to determine the most appropriate governance structure. A centralized structure, where the ownership is exercised by the Ministry of Finance rather than an independent agency seems to be better suited and also to be relatively successfully implemented in developing countries. Where a decentralized and dual model is already in place, a centralized authority (e.g., the Ministry of Finance/Treasury) can play a crucial role at least in collecting and monitoring information about the SOEs and their economic performance, including the detailed structure of the subsidies and intersectoral arrears.

Third, general corporate governance guidelines (and policy recommendations) need to be carefully adapted to infrastructure sectors. Particularly in the natural monopoly segments (with different legal and regulatory frameworks and market structures, there would be a need to design sector-tailored assessments of corporate governance. The different *market structure* and *regulatory* arrangements in which SOE enterprises operate matter greatly and governments may want to distinguish between SOEs operating in potentially competitive sectors from the ones under a natural monopoly structure. Competition provides not only formidable benefits but also unique opportunities for benchmarking, increasing the transparency and accountability of the sector.

Finally, governments may want to avoid partial fixes, by tackling both the internal and external *governance* factors. Focusing only on one of the governance dimensions is unlikely to improve SOE performance in a sustainable way.

Bibliography

Akram, Tanweer (2003) "The Dismal Performance of non-financial State-owned Corporations in Bangladesh", Department of Economics, Columbia University, New York, mimeo

Aivazian, Varouj A.; Ge, Ying and Jiaping Qiu (2005) "Can Corporatization Improve the Performance of State-Owned Enterprises even without Privatization?", *Journal of Corporate Finance*, 11 (5), 791-808.

Alam, A.; Murthi, M.; Yemtsov, R.; Murrugarra E.; Dudwick, N.; Hamillton, E. and E. Tiosson. (2005). Growth, Poverty and Inequality: Eastern Europe and the Former Soviet Union, Washington, DC: The World Bank.

Andrews, Matthew (2006) "Beyond Best Practice and Basic First in Adopting Performance Budgeting Reforms, *Public Administration and Development*, 26, 147-161.

Bai, Chong-En; Qiao Liu, Joe Lua, Frank M. Song, Junxi Zhang (2004) "Corporate Governance and Market Valuation in China", *Journal of Comparative Economics*, 32 (4), 599–616.

Bai, Chong-En and Lixin Colin Xu (2005) "Incentives for CEOs with Multitasks: Evidence from Chinese State-Owned Enterprises" *Journal of Comparative Economics*, 33 (3), 517-539.

Bartel, Ann P. and Ann E. Harrison (2005) "Ownership versus Environment" *Review of Economics and Statistics*, 87 (1), 135-147.

Basu, Prahlad K. (2005) *Reinventing Public Enterprises and its Management as the Engine of Development and Growth*, United Nation.

Bertero, Elisabetta and Laura Rondi (2002) "Does a Switch of Budget Regimes Affect Investment and Managerial Discretion of State-Owned Enterprises? Evidence from Italian Firms", *Journal of Comparative Economics*; 30 (4), 836-863.

Bozec, Richard, Breton, Gaetan and Côté, Louise (2002) "The Performance of State-Owned Enterprises Revisited", *Financial Accountability and Management*, 18, 383-407

Calderon, C. and A. Chong, (2004), "Volume and Quality of Infrastructure and the Distribution of Income: An Empirical Investigation", *Review of Income and Wealth*, 50 (1) 87-106.

Campos, J., Estache, Antonio; Martin, N. and L. Trujillo (2003), "Macroeconomic Effects of Private Sector Participation in Infrastructure", in Easterly, W. and L. Serven, *The Limits of Stabilisation*, Stanford University Press, Stanford.

Estache, Antonio (2008) "Infrastructure: A survey of Recent and Upcoming Issues", World Bank, mimeo.

Estache, Antonio and Quentin Wodon (2007) *Infrastructure and Poverty in Africa*, World Bank, mimeo.

Estache, Antonio; Foster, Vivien and Quentin Wodon (2002) *Accounting for Poverty in Infrastructure Reform – Learning from Latin America's Experience*, World Bank Institute Publications, Studies in Development Series.

Ferguson, Michael J.; Kevin C. K. Lam, and Grace Meina Lee (2002) "Voluntary Disclosure by State-owned Enterprises Listed on the Stock Exchange of Hong Kong", *Journal of International Financial Management and Accounting*, 13, 125-152.

Gómez-Ibáñez, José A. (2007) "Alternatives to infrastructure privatization revisited : public enterprise reform from the 1960s to the 1980s", World Bank Policy Research working Paper 4391.

Gómez-Ibáñez, José A. (2003) *Regulating Infrastructure: Monopoly, Contracts and Discretion*. Cambridge: Harvard University Press.

Grout, Paul (2003) "Public and Private Sector Discount Rates in Public-Private Partnerships", *Economic Journal*, 113 (486), 62-68.

Hart, Olivier (2003) "Incomplete Contracts and Public Ownership: Remarks and an Application to Public-Private Partnership", *Economic Journal*, 113, 69-76.

Irwin, Timothy and Chiaki Yamamoto (2004) "Some Options for Improving the Governance of State-Owned Electricity Utilities", The Energy and Mining Sector Discussion Paper, World Bank.

Jackson Peter M. (2001) "Public Sector Added Value: Can Bureaucracy Deliver?" *Public Administration*, Volume 79, Issue 1, 5-28.

Jensen, Paul H. and Robin E. Stonecash (2005) "Incentives and the Efficiency of Public Sector-Outsourcing Contracts", *Journal of Economic Surveys*, 19 (5), 767-787

Jones, Leroy P. (1991) "Performance Evaluation for Public Enterprises", World Bank Discussion Paper n. 122, World Bank.

Kirkpatrick, Colin; Parker, David and Yin-Fang Zhang (2004) "State versus Private Sector Provision of Water Services in Africa: a Statistical, DEA and Stochastic Cost Frontier Analysis", Centre on Regulation and Competition Working Paper n. 70, University of Manchester.

Kornai, János; Maskin, Eric; Roland, Gérard (2003) "Understanding the Soft Budget Constraint", *Journal of Economic Literature*, 41 (4), 1095-1136.

Kwoka, John E, Jr. (2005) "The Comparative Advantage of Public Ownership: Evidence from U.S. Electric Utilities", *Canadian Journal of Economics*, 38 (2), 622-40.

Martimort, David and W. Sand Zantman (2006) "Signaling and the Design of Delegated Management Contracts for Public Utilities", forthcoming in *Rand Journal of Economics*.

Martimort, David (2006) "An Agency Perspective on the Costs and Benefits of Privatization", *Journal of Regulatory Economics*, 30, 5–44.

McGuinness, Paul B and Michael J. Ferguson (2005) "The Ownership Structure of Listed Chinese State-Owned Enterprises and Its Relation to Corporate Performance", *Applied Financial Economics*, 15 (4), 231-46.

Megginson, William L. and Jeffry M. Netter (2001) "From State to Market: A Survey of Empirical Studies on Privatization", *Journal of Economic Literature*, 39 (2), 321-389.

Minogue, Martin (2004) "Regulatory Governance and the Improvement of Public Services", Centre on Regulation and Competition Working Paper n. 64, University of Manchester.

Nellis, John (2006) "Back to the Future for African Infrastructure? Why State-Ownership Is No More Promising the Second Time Around?", Centre for Global Development, Working Paper n. 84.

Nellis, J. and N. Birdsall (2005), *Reality Check: the Distributional Impact of Privatization in Developing countries*, Center for Global Development, Washington, D.C.

OECD (2005) *Corporate Governance of State-Owned Enterprises*, OECD, Paris.

OECD (2005) *Performance related Pay Policies for Government Employees*, OECD, Paris.

Omran, Mohammed (2002) "The Performance of State-Owned Enterprises and Newly Privatized Firms: Empirical Evidence from Egypt", Fondazione Eni Enrico Mattei, Nota di Lavoro n. 73.

Shirley, Mary M. and Lixin Colin Xu (1997) "Information, Incentives and Commitment: An Empirical Analysis of Contracts between Government and State Enterprises", Policy Research Working Paper n. 1769, World Bank.

Shirley, Mary M. and Patrick Walsh (2000) "Public versus Private: The Current State of the Debate." World Bank, Policy Research Working Paper no. 2420.

Vagliasindi, Maria (2007) *How to Improve Infrastructure Service Provision: Alternative Theoretical Models*, World Bank, mimeo.

Vagliasindi, Maria (2008) "Options to Improve the Governance and Performance of Publicly Owned Enterprises for Kosovo" World Bank Policy Note.

Vagliasindi, Maria and Jos Verbeek (2008) "Zambia: Elements of Effective Public Private Partnerships in Infrastructure" World Bank Policy Note.

Zhang, Le Yin (2004) "The Roles of Corporatization and Stock Market Listing in Reforming China's State Industry", *World Development*, 32 (12), 2031-47

Whitford, Andrew B. (2006) "Incentives and Tournaments in Public Organizations", Department of Public Administration and Policy, The University of Georgia, mimeo.

World Bank (2004) *State Owned Enterprises Reform in Iraq*, Reconstructing Iraq Working Paper n. 2, World Bank.

Annex 1

This Annex reports the main assumptions of the theoretical model presented in Section 5 of the paper, based on Vagliasindi (2007), which develop alternative models not only restricted to SOEs but also different forms of Public Private Partnerships (PPPs) and extend them in the case of adverse selection and moral hazard.

Social welfare is defined as the weighted sum of consumers net surplus S, profits Π, and the managerial net utility M.

(1) $\qquad W = S + \alpha_{\Pi} \Pi + M$

The weight attached to the profits α_{Π} can vary depending on the ownership/governance mode. We assume that it is less than one under private ownership, as in Baron and Myerson (1982). Under public ownership we assume it to be greater than one, given the additional cost of public funds due to distortionary taxation, as in Laffont and Tirole (1986). Specifically, in this case we can assume that the weight is equal to $\alpha_{\Pi} = 1+\lambda \geq 1$, where λ is the marginal cost of public funds.

We assume that the manager has is able to improve the delivery of infrastructure services, devoting his effort to two types of "innovation". It is possible for her to invest in quality-enhancing activities e (incurring a cost e), so that the overall level of quality of the infrastructure facility is given by the sum of the intrinsic quality level plus the additional investment by the manager (that is, $\theta = \varphi + e$). This quality-enhancing activity will, however, increase the unit cost by $\eta(e)$ (with $\eta(0) = 0$, $\eta' > 0$, $\eta'' < 0$). The manager can also engage in cost reduction activities i to enhance the productive efficiency of the firm. As a direct consequence of these activities, the overall level of cost will be reduced so that it will result from the difference between the level of intrinsic unit costs β and the realized level of cost saving $\sigma(i)$ (with $\sigma(0)=0$, $\sigma' > 0$, $\sigma'' < 0$).[16]

Accordingly, the profit function is:

(2) $\qquad \Pi = R - (\beta - \sigma(i) + \eta(e))q - m$

where R is the firm's monetary revenue, $c = \beta - \sigma(i) + \eta(e)$ is the marginal/average cost and m is the monetary transfer to the manager.

In order to provide the manager with the incentives needed incentives to undertake such investment activities, the condition

(3) $\qquad M = m - i - e \geq 0$

must be satisfied: where i and e are respectively the managerial investment in efficiency and quality improvements.[17] This simply requires that her net utility M is not negative. Otherwise, she would not carry out any investment activities.

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[16] As usual this efficiency index is a stochastic variable, realized after or before the contract is signed. It is mainly a function of the characteristics of the infrastructure, but it may be due stochastic factors, since nature selects the public and private operator's type randomly.

[17] Following Laffont-Tirole (1986) we can interpret i as the disutility of effort $\sigma(i)$ in cost-saving activities and $\eta(e)$ as the disutility of effort e in quality-enhancing activities. For simplicity's sake we assume that the two

Finally, the **social surplus** is given by the sum of net consumer surplus (gross surplus U less the social value of the revenue $\alpha_\Pi pq$ coming from customers' direct payments) and external costs E.

(4) $S = U(q, \theta) - pq$

U is the gross consumers' surplus, function of q the level of output of infrastructure services provided and θ the quality of the infrastructure service.[18] As usual in the literature, we assume $U(0, \theta) = 0$, with $U_q > 0$, $U_{qq} < 0$ and $U_q(0) = +\infty$ according to the standard Inada condition.[19] We also assume that: $U_\theta > 0$, $U_{\theta\theta} < 0$, $U_{q\theta} > 0$, $U_{qq\theta} < 0$. Namely, an increase in quality increases consumers' surplus ($U_\theta > 0$), but in a decreasing way ($U_{\theta\theta} < 0$). An increase in quality enhances consumers marginal benefits ($U_{q\theta} > 0$), but in a decreasing way ($U_{qq\theta} < 0$); i.e. the marginal valuation of quality by the marginal consumers is below the average valuation of quality (at the margin) over the ensemble of consumers ($U_{q\theta} < U_\theta/q$).[20] We assume that the net marginal utility of quality [that is, $U_{q\theta} q - c_\theta$ (where $c_\theta = 1+\eta'(e) q$)] is a non decreasing function of q in the relevant demand range (for q less than the marginal pricing output q^c).

Tables 1-3 report the optimality condition derived from the constrained maximization of social welfare, subject to the relevant budget constraints. In what follows we describe in more details the key features of the different governance models - for a more detailed derivation of the formulae see Vagliasindi (2007).

Let us rely on the theoretical goal of social welfare maximization in order to analyze the conditions under which different SOE governance arrangements can suit developing countries, taking into account the presence of a limited fiscal space. In a simple setting we have a unique shadow cost of public fund λ^*, equal for any single tax yield and any public firm revenue coming from the solution of the social welfare maximization problem. In practice, under different governance arrangements the nature and the level of the cost of public funds may be different. From a theoretical perspective, from one side of the spectrum of solutions the *decentralized* model represents the traditional situation in which the line ministry exercises the ownership function. It faces an infrastructure specific budget constraint (see Table 1), where the profit (loss) from the provision of infrastructure services (Π^{INFRA}) is covered by a fixed transfer (payment) equal to *F*. Under a decentralized model the cost of public funds associated with the binding infrastructure budget constraint is different from the economy wide cost of public funds, since each level of deficit (transfer) is associated with a level of mark-up (and distortion). The cost of public funds will also differ depending on whether the ownership function is exercised only by the Line Ministry (λ^{INFRA}) or shared with a general Ministry (λ^{DUAL}). On the other hand of the spectrum, the budget constraint is determined by a *centralized* model, where

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activities are independent, alternatively, we need to introduce an additional term given by the interaction between the two activities (*ie*) have $M = m - i - e - ie$.

[18] In the absence of quality enhancing activities (that is, when $e = 0$) the overall level of quality of the output is simply given by the intrinsic quality level of the infrastructure $\theta = \varphi$.

[19] This ensures that there is no shut-down case for the infrastructure service.

[20] As Spence (1975) noticed: consumers' valuation of quality at the margin is relevant for welfare ($\partial W/\partial\theta = 0$ implies $U_\theta = c_\theta$), while the marginal valuation of quality by the marginal consumers is relevant for the firm ($\partial\Pi/\partial\theta = 0$ implies $qU_{q\theta} = c_\theta$) and $U_{qq\theta} < 0$ implies that the monopoly undersupply quality (being the marginal valuation of quality by the marginal consumers decreasing as q rises).

the Ministry of Finance set up the economy wide transfer (F^{GLOB}) from a global budget constraint that include all the good produced in the economy (W^{GLOB}). Under a centralized ownership function, the cost of public fund is given by economy wide tax data and is independent from the financing issues of the infrastructure sector under consideration, as long as the latter is small relative to the economy. The divergence between the two costs of public funds can be determined by several factors, such as the absence of a sufficient level of transfers from the public budget to cover costs. The centralized model, where the Ministry of Finance exercises the ownership function, can be formally represented by the introduction of a global public budget constraint; namely a constraint which is not restricted to the infrastructure sector, but also include all the other sectors in the economy (λ^{GLOB}). The centralized model with an independent agency rather than the Ministry of Finance to exercise the ownership function can be formally represented in our stylized model by endogenizing the cost of public funds (λ^{SOE}).

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Table 1
Budget constraints under different Governance Regimes

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Governance Regimes	Budget Constraint
Infrastructure exogenous budget constraint for a decentralized Model – Line Ministry	$\sum_{I} \Pi^{INFRA} = F(\lambda^{INFRA})$
Infrastructure exogenous budget constraint for a decentralized Model – Dual Model	$\Delta T + \sum_{I} \Pi^{INFRA} = F(\lambda^{DUAL})$
Global budget constraint – Centralized Model – Independent agency	$\sum_{SOE} \Pi^{SOE} = F(\lambda^{SOE})$
Global budget constraint – Centralized Model- Ministry of Finance-Treasury	$T + \sum_{SOE} \Pi^{SOE} = F(\lambda^{GLOB}) + G$

Note: The comparison is based on the *ceteris paribus* hypothesis; that is, for the same level of marginal cost.

Different governance models are also associated with different tariff levels. As shown in Table 2, the two reference benchmarks are given by the case of perfect competition where marginal cost pricing prevails so that the Lerner index is equal to zero, and the case of a monopoly where so called inverse elasticity pricing rule ($L = 1/\varepsilon$) holds, since profit maximization requires marginal revenues to equate marginal cost. In deriving the level of tariff that maximize social welfare or profit, we assume that each single public firm faces a demand function independent from other goods, so that prices for the production of the infrastructure service should be set higher than marginal costs because of the presence of an additional distortion cost equal to the shadow cost of public fund for the last \$ of revenue. In practice, the percentage price cost mark-up $L = (p-c)/c$ (the so called Lerner index) is generally different from zero and can be less or equal to the level that maximizes revenues. Higher levels of mark-up (and distortion) are associated with decreasing deficits (transfers) to the firm budget.

As shown in Table 2, solving the constrained maximization problem, the decentralized model display the simple inverse elasticity pricing rule which characterized the optimal pricing set by a private monopolist holds, once we correct for the cost of public funds, associated with the transfer (payment) made to the firm. One of the notable features of the decentralized model is the "partial" equilibrium approach, due to the fact that the budget as well as the transfer (payment) to the SOEs is set up in advance, independently of the distortions that it may cause to the rest of the economy.

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Table 2
Comparison of Pricing under difference Governance Regimes

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	Price mark up
First Best	$L^* = 0$
Unregulated Monopoly	$L^m = 1/\varepsilon(q^m)$
Decentralized Model – Line Ministry	$L^{INFRA} = \lambda^{INFRA}/(1+\lambda^{INFRA})\varepsilon(q^{INFRA})$
Dual Model	$L^{DUAL} = \lambda^{DUAL}/(1+\lambda^{DUAL})\,\varepsilon(q^{DUAL})\,[\sum_i L_i/R_{INFRAi}\,\varepsilon_{ni}) + \sum_i (t_i/p_i)/R_{INFRAi}\,\varepsilon_{INFRAi})]$
Centralized – independent agency	$L^{SOE} = \lambda^{SOE}/(1+\lambda^{SOE})\,\varepsilon(q^{SOE})$
Centralized Model –MoF	$L^{GLOB} = \lambda^{GLOB}/(1+\lambda^*)\sum_j R_{ji}/\varepsilon_{ji}(q^{GLOB})$

Note: The comparison is based on the *ceteris paribus* hypothesis; that is, for the same level of marginal cost.

In the dual model, even if the two policy makers share the same welfare function, the optimality conditions are different from the ones that we have already considered in the presence of a single decision maker and a single budget constraint. On the one hand, the government budget officer, who pursues a revenue target from commodity taxation will not take into account the impact on her choices on the infrastructure sector and the other agent does not necessarily assess correctly her impact on the public revenue, when the shadow cost of public funds associated with the infrastructure budget constraint is not equal to the economy wide cost of public funds. For a centralized model where the Ministry of Finance exercises the ownership function, the simple inverse elasticity pricing rule, which holds in the case of a private monopolist, becomes more complicated, as the simple own price elasticity is replaced by the super-elasticity, including the correction coming from cross-elasticity terms. Notably, the relevant cross-elasticity for infrastructure services can be high, even if the direct distortions in the infrastructure market are small (so that the own infrastructure price elasticity is low), because of the presence of large distortions in another markets. As a consequence, the public sector should be careful to allow the increase of price of infrastructure services, to reduce the production deficit to achieve its global deficit target. For a centralized model where an independent agency exercises the ownership function the corresponding public pricing is a weighted average of monopoly pricing and marginal cost pricing, where the two extreme cases of monopolistic and marginal cost pricing are reached respectively when the cost of public funds tends to infinity and zero. In practice, the independent authority faces a shadow cost of public fund λ^{SOE} which is not necessarily equal to the economy wide cost of public funds λ^{GLOB}, since the authority only looks after SOEs, ignoring goods and services produced by private enterprises in the economy. Even if the authority optimally supervises SOEs, the level of deficit to be covered through transfers can be high, particularly if the tariffs are far from the competitive ones.

As shown in Table 3, for all governance models the first order conditions with respect to the cost saving and quality enhancing activities are given by the weighted average of the two reference benchmarks, given by the case of perfect competition and monopoly, where the weights are equal to $\lambda/(1+\lambda)$ and $1/(1+\lambda)$ respectively. Both in the case of perfect competition and monopoly, cost minimization prevails, so that the optimal cost saving activity i is reached when the marginal unit of cost-saving investment [σ'(i)q] brings an unit saving in cost reduction. Hence, all governance models

are efficient in that they minimize costs. However, the optimal level of cost reduction activity will differ, depending on the level of distortion as determined in Table 2.

Table 3
Comparison of Cost Reduction and Quality under difference Regimes

	Cost Reduction	**Quality**
First Best	$\sigma'(i^*) = 1/q^*$	$U_\theta = C_\theta$
Unregulated Monopoly	$\sigma'(i^m) = 1/q^m$ with $i^m < i^*$	$U_{q\theta}\, q^m = C_\theta$ with $\theta^m < \theta^*$
Decentralized Model – Line Ministry	$\sigma'(i^{INFRA}) = 1/q^{INFRA}$ with $i^m < i^{INFRA} < i^*$	$\lambda(p_\theta q^{INFRA}) + U_\theta = (1+\lambda^{INFRA})C_\theta$ with $\theta^m < \theta^* < \theta^{INFRA}$
Dual Model	$\sigma'(i^{DUAL}) = 1/q^{DUAL}$ with $i^m < i^{DUAL} < i^*$	$\lambda^{DUAL}(p_\theta q^{DUAL}) + U_\theta = (1+\lambda^{DUAL})C_\theta$ with $\theta^m < \theta^* < \theta^{DUAL}$
Centralized – independent agency	$\sigma'(i^{SOE}) = 1/q^{SOE}$ with $i^m < i^{SOE} < i^*$	$\lambda(p_\theta q^{SOE}) + U_\theta = (1+\lambda^{SOE})C_\theta$ with $\theta^m < \theta^* < \theta^{SOE}$
Centralized Model –MoF	$\sigma'(i^{GLOB}) = 1/q^{GLOB}$ with $i^m < i^{GLOB} < i^*$	$\lambda(p_\theta q^{GLOB}) + U_\theta = (1+\lambda^{GLOB})C_\theta$ with $\theta^m < \theta^* < \theta^{GLOB}$

Under perfect competition, the optimal quality level θ is the one for which the marginal benefit of quality U_θ equals its social marginal costs C_θ. Under a monopoly, quality-enhancing investments are sub-optimal, since the monopolistic firm equates its marginal private benefit from quality-enhancing (i.e. the marginal consumer's willingness $p_\theta = U_{q\theta}$ times the units sold q^m) to its marginal costs c_θ. This implies for a given level of output the presence of two distortionary effects. The private manager does not consider the average consumers' benefits of quality (U_θ/q), but only the marginal consumer's benefit $U_{q\theta}$, which is lower, given our assumption according to which $U_{q\theta}<0$. For each of the governance model, the optimal level of quality is the weighted average of the perfect competition and monopoly, with weights equal to $\lambda/(1+\lambda)$ and $1/(1+\lambda)$.

From the analysis of Tables 1-3 above, it is interesting to note that a higher level of shadow cost of public fund (λ) is associated with lower? subsidies to cover infrastructure fixed cost. This in turn implies higher price mark up and lower cost reduction and quality enhancing activities.

One of the simplifying assumptions made in the decentralized model is that the Line Ministry is a benevolent authority, so that it will take into account the social costs of public funds. Moreover, given the lump sum transfer to the whole infrastructure sector $F°$, if the Line Ministry is only concerned with allocative efficiency, it can use to some extent the demand elasticity of the different infrastructures to minimize the cost of public funds associated with the transfers. The less elastic is the demand for a given infrastructure, the higher the socially optimal price. If the Line Ministry, as it is more likely to be the case, is concerned with equity considerations, it will be faced with a trade off. On the one hand, efficiency considerations would require increasing the prices of the most inelastic services, whereas redistributive reasons may require lowering them (as far as they are necessities). Similarly, the prices that should be increased the least based on efficiency grounds (as they are more elastic) may be the ones that should be increased the most for redistributive reasons (since they represent luxuries, i.e. consumed in higher proportions by the rich).

What about the impact of the payment/transfer on the infrastructure SOE's account? As mentioned earlier, the budget transfer to the SOE infrastructure providers is fixed F^{INFRA}, so that the infrastructure SOE can break even assuming that its level of transfer has been correctly calculated, i.e. equal to the level F^{GLOB} corresponding to socially optimal level λ^{GLOB}. Otherwise, the SOE will end up with a too high or low level of transfer (or global budget deficit). When the unconstrained level of infrastructure deficit is greater than the constrained one, underprovision of services takes place at the expense of consumers.

One of the notable advantages of the centralized model from a theoretical perspective is the fact that the budget, as well as the transfer (payment) to the SOEs can be administered in a flexible way, so as to create the lowest possible distortions in the overall economy. In other words, it is easier to reach the optimal level of distortion λ^{GLOB} and transfers (deficits). The Ministry of Finance is the best placed policy maker to strike the optimal balance between increases in tariffs and revenue burden, so as to minimize distortions in the overall economy. Since the Ministry of Finance is only concerned with allocative efficiency, it can use the demand elasticity of each good to minimize the excess burden: the less elastic is the demand of a good the more it raises its price in order to minimize the level of deficit to be financed through public funds. Notably the policy can also choose the optimal trade off between efficiency and equity. What about the impact of the transfer on the infrastructure SOE's account? In this case, the budget transfer to the SOE is flexible, so that the infrastructure SOE can end up with a high or low level of transfer, depending on the role and size of the public sector in the economy. If the cost of public funds is very high (near to infinity), we go back to monopoly model and hence to the monopolistic pricing.

The centralized model with an independent agency rather than the Ministry of Finance to exercise the ownership function can be formally represented in our stylized model by endogenizing the cost of public funds. Even if the authority optimally supervises SOEs, the level of deficit to be covered through transfers can be high, particularly if the tariffs are far from the competitive ones.

In the dual model we assume that the Line Ministry is in charge of the infrastructure sector and all the other SOEs, but has no authority over the rest of the economy (that is, it takes all other prices as given), nor is in charge of fiscal decisions (namely, the tax rates are fixed by the public sector). In this case, we also need to explore the presence of eventual interferences with other central decision makers, such as the government central budget officer (who raises public funds from the commodity taxation and aims to reach a revenue target) and the rest of the economy, in the presence of price-cost divergences. In the previous cases, we ignored the rest of the economy adopting a partial equilibrium approach, since the solution would not be affected by any economy wide considerations.

The Line Ministry may take into account the impact of its choices on the other n-1 goods/services markets of the economy (which are not necessarily perfectly competitive) and on the allowed public budget for infrastructure, through indirect taxation. However, it does not take into account the impact of other public expenditures on social welfare, since that does not affect its allowed deficit. In this case, pricing is affected by: (i) the monopolistic structure of the rest of the economy and (ii) the commodity taxation set by the public sector. Let us consider first the link between the infrastructure sector and the rest of the economy: The divergence between price and cost in the infrastructure market is negatively (positively) related to the divergence in other markets in case of substitutability (complementarity) between the infrastructure service and the other good (service) in the economy. Let us first consider the case of substitutes and let us assume that an increase of the output of the i-th

good reduces the price of the infrastructure service, in an amount depending on the own price elasticity. This will, in turn, decrease the demand of the i-th good, in an amount depending on the cross price elasticity. Accordingly, the social cost of the monopolistic structure of the i-th market increases; i.e. the deadweight welfare loss associated with the marginal unit of infrastructure service is higher, further reducing the consumption of the good that is already under-consumed in the economy with a negative impact on consumer surplus. On the other hand, when the goods are complements an increase in the infrastructure service will increase the demand of the i-th good (under-consumed in the economy) with a positive impact on consumer surplus. This implies a tendency for the price of infrastructure service to positively diverge from its marginal cost if the service i is a substitute for all other goods. If the service i is a complement for other goods this instead implies a negative divergence from marginal cost and a tendency to lower infrastructure prices. The latter case seems more plausible for infrastructure services (e.g. power and transport) that are often used as inputs for the production of other goods (or are jointly demanded) even if they may compete with alternative privately provided goods.

Just in passing, it is worth to note that the public sector accommodates to the market, though this process of "accommodating" to market imperfection is lower the tighter is the constraint (i.e. the higher the value of the cost of public fund). This result, originally due to Lipsey and Lancaster, has been criticized for its implications, since the public sector favors a monopoly, increasing the demand for the monopolized good and hence monopoly profits. However, this criticism is to some extent unfair, since the initial hypothesis was the existence of price cost margins, which may not necessarily be due to abuse of monopoly but can be determined by the presence of other complications, such as commodity taxation. Moreover, the aim of public authorities other than the one who are looking after the infrastructure sector should be to reduce eventual divergence from optimal outcomes in others markets.

Let us now tackle the link of infrastructure with the tax rates. Through the budget constraint, the infrastructure price divergence from marginal pricing is negatively related to the tax rates on other goods, when their consumption is positively correlated. In this case, as the output increases it reduces its own price, increasing the demand of the i-th good and hence the revenue from the tax on the i-th commodity. For this reason, the budget constraint is relaxed and it is possible to reduce the percentage price-cost divergence in the infrastructure service market. At the same time such a positive relationship also reduces the shadow cost of public funds in the infrastructure service. That is, the marginal social benefits of a unit relaxation of budget constraint are reduced, because the deficit that the agency can afford is increased.

It is also worth to note that even if the two policy makers share the same welfare function, the optimality conditions are different from the ones that we have already considered in the presence of a single decision maker and a single budget constraint. On the one hand, the government budget officer, who pursues a revenue target from commodity taxation will not take into account the impact of her choices on the infrastructure sector and the other agent does not necessarily assess correctly her impact on the public revenue, when the shadow cost of public funds associated with the infrastructure budget constraint is not equal to the economy wide cost of public funds. On the other hand, the infrastructure agency will not take into account the impact of her choices on the indirect taxation revenue, if she is not the residual claimant of the revenue from commodity taxes.

Last but not least, the objectives of the different policy makers do not necessarily coincide, e.g. the government budget office, may also pursue redistributive targets, while the decentralized policy-

maker may not, or vice-versa. Hence, even if the values of transfer and the tax revenue targets were carefully chosen by a benevolent planner this may not necessarily overcome such problems, unless he can provide the correct incentives to make the two decision makers behave as desired, using additional instruments or constraints.

Annex 2

Extract from OECD Guidelines for SOE Corporate Governance

THE STATE ACTING AS OWNER
The state should act as an informed and active owner and establish a clear and consistent ownership policy, ensuring that the governance of state-owned enterprises is carried out in a transparent and accountable manner, with the necessary degree of professionalism and effectiveness.
Principle A: The Government should develop and issue an ownership policy that defines the overall objectives of state ownership, the state's role in the corporate governance of SOEs, and how it will implement its ownership policy.
Principle B. The Government should not be involved in the day-to-day management of SOEs and allow them full operational autonomy to achieve their defined objectives.
Principle C: The state should let SOE boards exercise their responsibilities and respect their independence.
Principle D: The exercise of ownership rights should be clearly identified within the state administration. This may be facilitated by setting up a coordinating entity or, more appropriately, by the centralization of the ownership function.
Principle E: The coordinating or ownership entity should be held accountable to representative bodies such as the Parliament and have clearly defined relationships with relevant public bodies, including the state supreme audit institutions.
Principle F: The state as an active owner should exercise its ownership rights according to the legal structure of each company. Its prime responsibilities include: 1. Being represented at the general shareholders meetings and voting the state shares.   2. Establishing well structured and transparent board nomination processes in fully or majority owned SOEs, and actively participating in the nomination of all SOEs' boards.   3. Setting up reporting systems allowing regular monitoring and assessment of SOE performance.   4. When permitted by the legal system and the state's level of ownership, maintaining continuous dialogue with external auditors and specific state control organs.   5. Ensuring that remuneration schemes for SOE board members foster the long term interest of the company and can attract and motivate qualified professionals.

TRANSPARENCY AND DISCLOSURE
State-owned enterprises should observe high standards of transparency in accordance with the OECD Principles of Corporate Governance.
Principle A: The coordinating or ownership entity should develop consistent and aggregate reporting on state-owned enterprises and publish annually an aggregate report on SOEs.
Principle B: SOEs should develop efficient internal audit procedures and establish an internal audit function that is monitored by and reports directly to the board and to the audit committee or the equivalent company organ.
Principle C: SOEs, especially large ones, should be subject to an annual independent external audit based on international standards. The existence of specific state control procedures does not substitute for an independent external audit.
Principle D: SOEs should be subject to the same high quality accounting and auditing standards as listed companies. Large or listed SOEs should disclose financial and non-financial information according to high quality internationally recognized standards.

Principle E: SOEs should disclose material information on all matters described in the OECD Principles of Corporate Governance and in addition focus on areas of significant concern for the state as an owner and the general public. Examples of such information include;

1. A clear statement to the public of the company objectives and their fulfillment;

2. The ownership and voting structure of the company;

3. Any material risk factors and measures taken to manage such risks;

4. Any financial assistance, including guarantees, received from the state and commitments made on behalf of the SOE;

5. Any material transactions with related entities.

THE RESPONSIBILITIES OF THE BOARDS OF STATE-OWNED ENTERPRISES

The boards of state-owned enterprises should have the necessary authority, competencies and objectivity to carry out their function of strategic guidance and monitoring of management. They should act with integrity and be held accountable for their actions.

Principle A: The boards of SOEs should be assigned a clear mandate and ultimate responsibility for the company's performance. The board should be fully accountable to the owners, act in the best interest of the company, and treat all shareholders equitably.

Principle B: SOE boards should carry out their functions of monitoring of management and strategic guidance, subject to the objectives set by the Government and the ownership entity. They should have the power to appoint and remove the CEO.

Principle C: The boards of SOEs should be composed so that they can exercise objective and independent judgment. Good practice calls for the Chair to be separate from the CEO.

Principle D: If employee representation on the board is mandated, mechanisms should be developed to guarantee that this representation is exercised effectively and contributes to the enhancement of the board skills, information and independence.

Principle E: When necessary, SOE boards should set up specialized committees to support the full board in performing its functions, particularly in respect to audit, risk management and remuneration.

Principle F: SOE boards should carry out an annual evaluation to appraise their performance.