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# *Decentralization and Infrastructure: From Gaps to Solutions*

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## **Abstract**

The subnational dimension of infrastructure emerges as one of the greatest challenges in contemporary public finance policy and management. Given the localized nature of most infrastructures, ensuring its efficient provision represents a challenge for all countries irrespective of their level of centralization or decentralization. This paper introduces the fundamental questions surrounding the provision of infrastructure in decentralized settings and summarizes the findings from a collection of original essays prepared for this volume by a set of worldwide experts on this subject with the objective of advancing our understanding of the interplay between decentralization and infrastructure. More specifically, the paper discusses the extent of infrastructure gaps and the quality of subnational spending; inquires how functional responsibilities, financing and equalization can be designed; discusses sector-specific arrangements; drills down to the key steps of the public investment cycle and management aspects; and analyzes the political economy and corruption challenges that typically accompany decentralized infrastructure projects. The paper also presents avenues for the strengthening of decentralized public investment and infrastructure provision processes, concluding that they need to be country-, sector- and place-specific. While it is clear that institutional arrangements for infrastructure management will vary across countries, in all cases several decision-making steps need to be coordinated across levels of government in order to ensure efficiency in delivery, equity in spending, and accountability over final results.

## **I. Introduction and Motivation**

The subnational dimension of infrastructure emerges as one of the key dimensions for improved public investment. Whether a country is centralized or decentralized, whether it relies on delegated authorities or autonomous subnational governments, it has to face the question of multi-level coordination and provision of infrastructure. Given the localized nature of most infrastructures, the territorial dimension cannot be obviated. Any country that wishes to improve service delivery; increase competitiveness, as well as foster growth through investment in capital infrastructure faces the intergovernmental coordination challenge.

The approaches which countries have used to tackle this multi-level challenge vary widely. Some countries execute up to 90 percent of their public investment through subnational level governments, while others not nearly 10 percent. But this share of expenditures is not always a good indicator of the decision-making authority of subnational governments in the selection, prioritization, funding and execution of infrastructure projects. The several stages and decision-making steps which need to be coordinated across levels typically give rise to a complex web of accountability over final results. Not surprisingly, outcomes have been mixed and vary widely from country to country and from region to region in the same country. The biggest challenge is that inefficiencies in management and execution can be pervasive across the different subnational units ultimately translating into poor service delivery and wasted resources.

The main objective for the collection of original essays in this book is to advance our understanding of the interplay between decentralization and infrastructure. This fundamental issue is approached from multiple perspectives and in an inter-disciplinary fashion. The collection of papers is intended to cover the most important aspects of infrastructure investment in a decentralized setting. They discuss the infrastructure gaps and the quality of subnational spending; inquire how functional responsibilities, finance and equalization can be best designed; discuss specific issues related to infrastructure and service delivery in different areas of the public sector; drill-down to key steps of the public investment cycle and management aspects; and also analyze political economy and corruption challenges. The essays offer academic rigor but also attempt to inform the policy debate with the aim of improving the outcomes of decentralized investment spending, and bringing “value for money”. Far from representing a closed set of final recommendations, the papers highlight diverse views and avenues for improving public investment in decentralized settings, keeping in mind that ultimately what will work needs to be “country and place specific.”

Against this backdrop, three global challenges have motivated this book:

- (i) **Coordination matters: The volatile macro environment which prevails internationally underscores now more than ever the need to coordinate public investment and infrastructure provisions across levels of government.** While responses to the 2007/2008 crisis have varied and involved different strategies regarding capital spending, countries will continue to rely on subnational levels of government to provide a substantial part of their infrastructure needs. National growth inherently relies on regional growth, and due to its localized nature, public investment can be a critical ingredient to achieve this goal. However, decisions to spend, and decisions to finance, are often not taken on the same level of government. Poor

coordination within decentralized systems of government can prevent countries from achieving their goals.

- (ii) **Equity matters: Infrastructure gaps are still significant, particularly across subnational units.** While starting points are much different, particularly across OECD and non-OECD countries, in many cases there are notable advances in reducing gaps. But progress has not been even. Country-wide statistics based on national averages can be misleading and hide deep disparities. Gaps can be particularly large across subnational jurisdictions (horizontal gaps); these gaps are increasingly structured along urban-rural lines, particularly in the developing world. This represents a major impediment to improving access to public services on an equitable basis, and for reducing poverty. Due to the shifting nature of gaps and the localized nature of infrastructure itself—often spanning across several jurisdictions—finding responsible agents to addressing these disparities constitutes a serious challenge.
  
- (iii) **Efficiency matters: Infrastructure investments need not only more resources but also to deliver “value for money.”** Many countries have already “invested” much in decentralization as well as subnational infrastructure provision in the last two decades, but the results are mixed. Efficiency cannot easily materialize in environments where responsibilities over the investment cycle or service delivery are unclear; or where public investment is carried out by-passing critical decision steps. The pressure to demonstrate results is increasing on behalf of citizens, but cannot be adequately addressed without looking deeper into institutional design issues. The challenge here lies in identifying the responsible levels of government for planning, financing, and executing investment, and ultimately delivering services with some standard of equity.

The responses to these three challenges are necessarily complex as evidenced by the efforts under way in many countries, and they require careful examination. This is what the following 13 papers in this collection attempt to do. Before turning to the discussion of these sections, we take a closer look at the main institutional aspects of decentralized infrastructure and public investment. As will become clear in the next section, decentralized infrastructure is fast emerging as one of the greatest challenges in contemporary public finance policy and management.

## II. The Complexity of the Institutional Dimensions of Decentralized Infrastructure and Public Investment

Infrastructure provision entails the construction, operation, and maintenance of the long-lived physical assets required to deliver specific public services. There are different ways to classify types of infrastructure. A useful approach is to divide infrastructure into “network infrastructure”, such as roads, streets, bridges, electricity, and water; and “point infrastructure”, such as hospitals and school buildings, which is more common to the social sectors. The latter often require further inputs—such as teachers and health personnel—in order to provide full service delivery to citizens.

While practices vary, the investment cycle for infrastructure encompasses the following key steps.<sup>1</sup> Planning and project appraisal constitute the initial steps; this is followed by project selection and a decision to provide the necessary budgetary resources. Implementation entails procurement as well as contract management to account for changes during execution, before facilities can be operated and services delivered eventually. Ex-post evaluation of completed projects is usually the final step in the building process. After that come operation and more importantly maintenance. Each of these steps can be decentralized, or performed in a shared fashion across levels of government. Regulation of the service, including setting standards, can also be decentralized or shared among levels of government.

As a multi-sector, cross-cutting, and multi-level process, decentralized public investment typically involves a high number of actors and agents.

- At both subnational and national levels, it involves Ministries of Finance, planning entities, sector ministries, and service delivery units.
- In some country settings, community associations play a large role, particularly in post-conflict countries with limited state presence.
- Infrastructure is also provided by public enterprises.
- With diverging models and approaches, public investment can involve private agents (Public-Private-Partnerships—or PPP as one form);<sup>2</sup> but not all governments handle private involvement under a unified project cycle, which creates a separate, often complex layer in decision-making and management.
- In aid dependent countries, international development agencies can also play a major role.

The relationships among these players can be complex, and easily poorly defined in law and/or practice. From a territorial point of view it is noteworthy that some investments are carried out in single-purpose districts, which may or not coincide with territorial jurisdictions of (general) subnational governments. In addition, further complexity can be introduced through sub-tiers within the main levels, and having only some of them playing a role in infrastructure.

In this myriad of organizational possibilities for the provision of infrastructure in intergovernmental arrangements, three main models have emerged:

- Some countries provide a leading role to sector agencies, which at the national or subnational levels oversee or perform directly critical steps in the project cycle, such as performing planning functions and setting standards for project appraisal; some of these tasks can be centralized with subnational governments having to follow them,

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1. Public investment is defined as gross public fixed capital formation (IMF's World Economic Outlook; WEO). Public gross fixed capital formation is referred to the general government sector, excluding public corporations. For the analysis of subnational public investment, such definition is not without shortcomings since, for example, critical infrastructure such as water or electricity is often provided by public enterprises managed or regulated by subnational governments.

2. There are a number of different delivery modes involving the public or private sector to differing degrees. These include public ownership and procurement, which has often characterized the water supply and road networks; concessions and public-private partnerships (PPPs), which are increasingly involving the private sector in the delivery of infrastructure; and fully privately-owned companies, which has often been the case in the energy sector.

independently of the level of central co-financing. Spain provides an example for this approach.

- Another group of countries emphasize the role of ministries of finance or planning as leading agencies, whether at the central or subnational levels. In federal systems such as the U.S. and Canada federal governments have limited powers to regulate in many areas, so it is left to subnational governments to act with wide margins of autonomy. In other countries, subnational governments are required to follow the standards set by central government entities. The sector agencies keep only a marginal role in this model. South Korea is an example of this model.
- In another group of countries, particularly in the developing world, a community management model is applied. In these arrangements, planning and project selection is done from the bottom-up, with marginal participation of subnational governments, if they are present at all. Particularly in post-conflict situations, limited state presence at any level of government requires different approaches. Indonesia and Cambodia are examples for this model.

In practice, the degree of formality with which these models are applied varies widely, particularly in developing countries with emerging intergovernmental frameworks. Often, the role of subnational governments can remain under-regulated giving rise to widely discretionary environments.

But regardless of the main model used a common trait is that decentralized infrastructure provision requires coordination among levels of government. Service standards or procurement rules tend to be shared to some extent; and even in the most decentralized countries, subnational governments are often required to adopt central regulations and standards. This is even truer for infrastructure which generates positive externalities or spill-over effects to other jurisdictions, since it usually requires coordinated planning and central co-financing.

As an outcome of the above complexity of the institutional dimensions, the traditional labels that are used to characterize the degrees of subnational autonomy are not easily applicable to infrastructure provision. Even if formally labeled “autonomous”, “delegated,” or “deconcentrated”, public investment more often than not requires joint decisions, which cannot be easily coordinated. This is so independently of unitary or federal countries, or the specific decentralization model at hand. Given the usually high level of co-financing, subnational governments in practice are often subject to standards of quality, quantity, and access established by higher levels of government. Upper level authorities often also exercise monitoring and evaluation functions.

### **III. A Discussion of the Contributions**

The individual contributions to this volume fall naturally in five main sections:

#### *Section 1: Measuring Infrastructure Gaps: Quantity and Quality Perspectives*

How large are infrastructure gaps?: Access to infrastructure services is very disparate across the world regions. Irrespective of possible differences across the sectors, South Asia and Sub-Saharan Africa (SSA) have the largest infrastructure gaps compared to other regions of the

world. By comparison, most of the OECD countries have already well-developed infrastructure and are able to focus on quality considerations. The measurement of infrastructure gaps is the main theme of **Paper 2 by Luis Andres, Dan Biller and Jordan Schwartz** entitled “**The Infrastructure Gap and Decentralization**”.

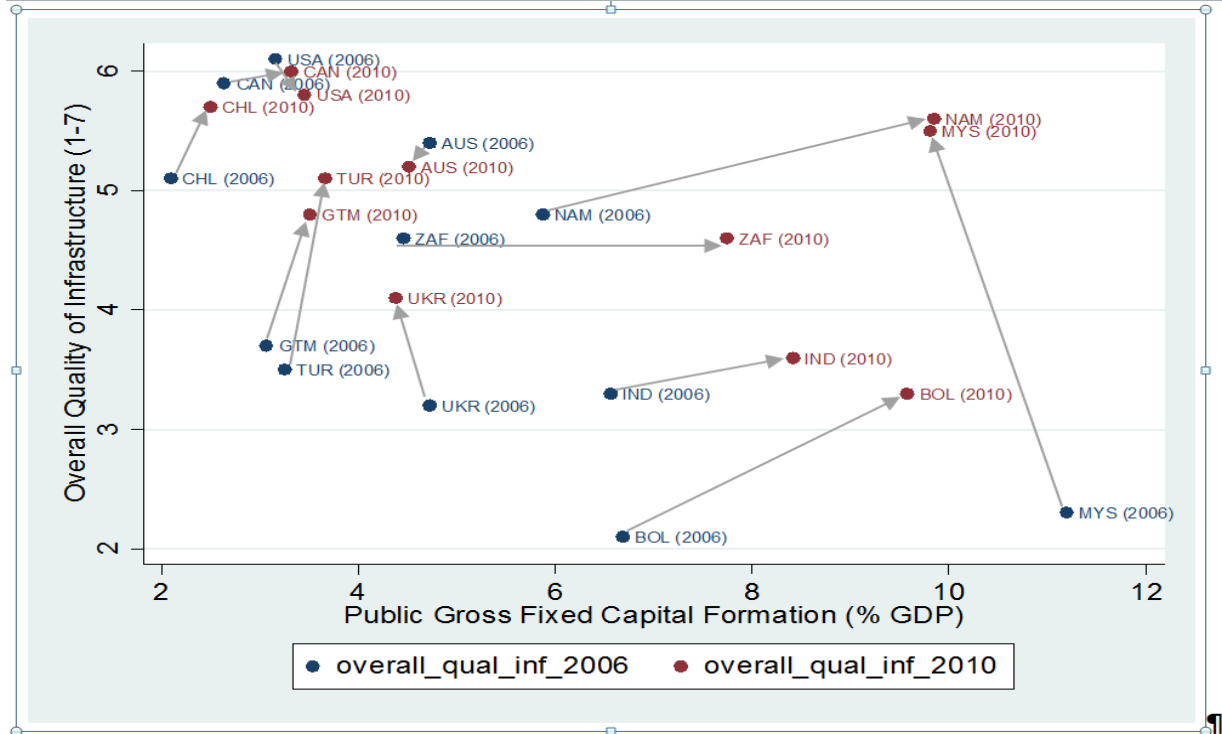
Recognizing the different starting points in the stock of infrastructure is critical to assess improvements and progress. Another dimension is the quality of infrastructure. Deficiencies tend to be large in this dimension and even in the most advanced countries, quality challenges remain or are re-appearing. Figure 1 tracks countries with regards to (i) their overall level of public investment spending in GDP terms,<sup>3</sup> and (ii) their different levels of progress in quality as assessed by surveys.<sup>4</sup> As is apparent, countries experience not only advances but also backward steps—and these have occurred also in the OECD countries. In turn, some countries in the developing world have taken respectable leaps forward. But again, it is important to recognize the different starting points with regards to the stock and also quality of infrastructure.

The subnational dimension comes into play once country-level data are disaggregated across the different territorial units. As documented in Paper 2, differences in access to services can be particularly heterogeneous among subnational units. Using district level data for the entire South Asia Region, Andres, Biller and Schwartz ranked districts by quintiles on access to electricity, gas, improved water, improved sanitation, and telecommunications.. In India, some of the best indicators of access to improved water sources can be found in districts located in the north and north west of the country, while some of the worst indicators are in districts in the north east and west as well as in the south west coast. To complicate matters, districts with “good” access to one infrastructure service do not have necessarily “good” access to other types of infrastructure services. For example, districts in Kerala fare well with regards to improved sanitation, but have among the worst indicators for access to improved water sources (Andres, Biller, and Herrera Dappe, 2013).

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<sup>3</sup> The Figure compares the averages of years 2002-2006, which represent the pre-crisis years; and the averages of years 2007-2010, which reflect post-crisis responses.

<sup>4</sup> The infrastructure quality is ranked from 1 to 7: “extremely underdeveloped” as 1 and “extensive efficient” by international standards as 7 according the Global Competitiveness Report 2010-2011 of the World Economic Forum (WEF 2010). These are survey results bases on the question: "How would you assess general infrastructure (e.g., transport, telephony, energy) in your country?" The survey is administered to citizens and businesses.

**Figure 1. Progress in Quality of Infrastructure and Public Investment Spending (2002-2010)**

Source: Based on data from World Economic Forum (2006 and 2010) and IMF-WEO (2002-2010).

The overarching trend that shapes the development of infrastructure gaps is urbanization. While the urbanization process is less pronounced in some regions like South Asia and Sub-Saharan Africa, it implies that the demand for services is and will be even more territorially uneven—and shifting across the different subnational units. This creates the need to target infrastructure even more precisely to particular geographical areas and the needs of citizens.<sup>5</sup> Addressing these challenges is also critical to achieving some of the 2015 Millennium Development Goals (MDGs). This is necessarily so given the link between reducing poverty and infrastructure coverage. At the same time, given such dynamics in the future location of population and the limited capacity to estimate future demand, the risk of over- or under-supply of infrastructure is equally large, and can easily lead to wasteful spending.

In the process of urbanization, achieving efficiency is challenging also from another point of view. Urban areas can benefit from economies of scale—implying diminishing unit costs—in many services (water; health above the primary level;); but it is also true that the large, growing urban areas often do not integrate sufficiently well in a horizontal sense to reap these benefits even further. On the other hand, some services are only demanded in urban areas (urban transport and mass transit). In rural areas the situation tend to be quite different: the cost for delivering services and infrastructure increases often considerably due to geographic reasons and

5. Based on these findings, the emerging wisdom from a policy perspective is to provide a package of basic services independent of the location of citizens, and facilitate connectivity among rural and urban areas to allow for and facilitate migration. For the rural areas—which is where the poor are mostly concentrated—this should encompass social services, education, health, water and social assistance where appropriate. Road and other transport and communication are also needed to better link urban and rural areas.

distance; while some infrastructure can be delivered without significant economies of scale (school buildings, as relevant for primary education), this is not equally true for water systems, or health services particularly when considering increasing levels of care.

This has also implications for fiscal equalization. The urban-rural dynamics imply that costs and needs for the provision of infrastructure are changing, along with fiscal capacity. This might require different approaches as to how to equalize and on what criteria the different capacities to spend, including on infrastructure, should be based. We will return to the equalization issue further below.

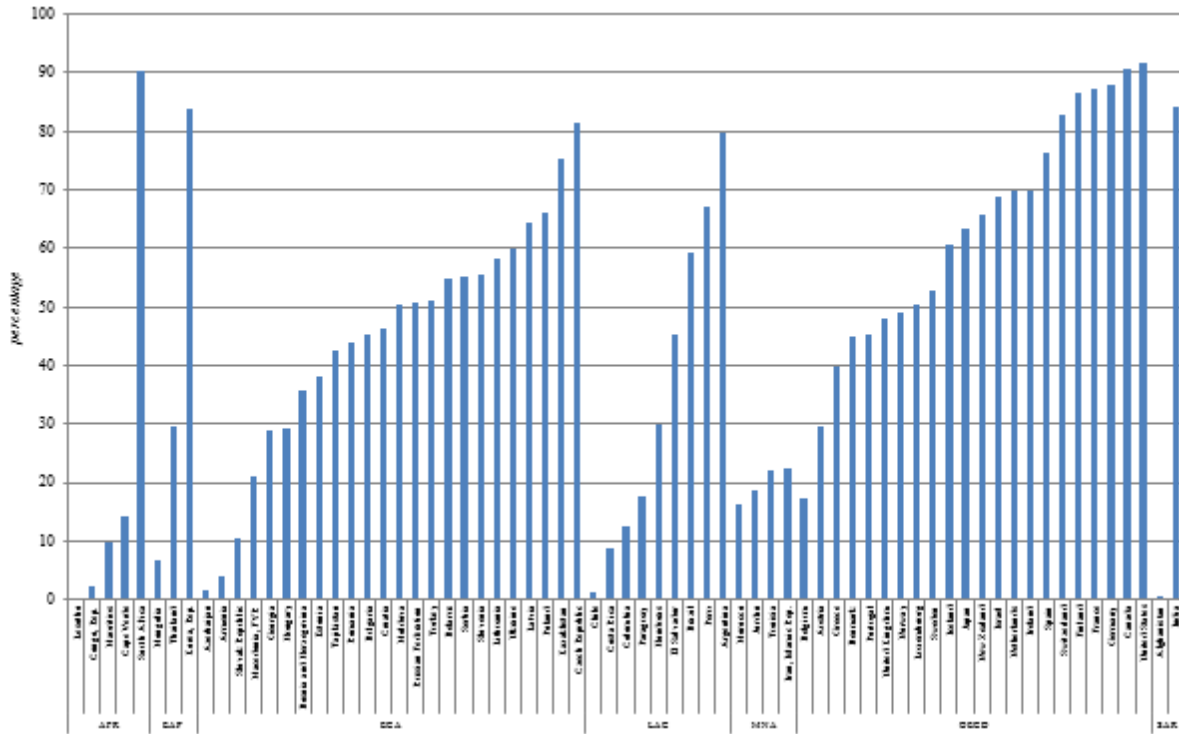
How have subnational governments responded in addressing the infrastructure gaps?: The two fundamental questions which need to be answered in first place are: who is and will be responsible for addressing infrastructure gaps? And who will be responsible for paying the cost? Answering these questions is paramount as the current demand for infrastructure is estimated at approximately US\$0.8-0.9 trillion of annual infrastructure investments in the developing world; by 2020 this figure inflates to US\$1.8-2.3 trillion per year. This equates to roughly an increase in annual infrastructure investment from 3 percent of developing world GDP to 6-8 percent of GDP<sup>6</sup>. In principle, in a decentralized system such costs need to be distributed among the different levels of government. How that is actually done remains the one critical question in addressing the infrastructure gaps.

Finding satisfying answers to these questions is not very straightforward. Countries involve subnational governments to varying degrees. Figure 2 highlights the level of decentralization of public investment. While one can conclude that by and large, the share of subnational governments in total capital expenditures of a country is typically twice their share in total recurrent expenditures (Martinez-Vazquez and Timofeev, 2012), there is wide variation among countries in their level of decentralized investment spending. This ranges from less than 10 percent to up to 90 percent of the total.<sup>7</sup> But again this is not a full indicator of subnational autonomy—as decision-making power usually varies, due to the high levels of joint management and other reasons.

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<sup>6</sup> Data from Andres, Biller, and Schwartz (2013) in this volume. Also see Bhattacharya, Romani, and Stern (2012); Fay et al. (2011); Estache (2010); and the MDB Working Group on Infrastructure (2011).

<sup>7</sup> In 2010, a group of countries spent between 80 and 90 percent of total public investment through subnational governments. These include India, South Africa, Czech Republic, Argentina, and a series of OECD countries, including the United States, Canada, and Germany. Among the more “centralized” countries—spending less than 20 percent of total public investment sub-nationally—are some countries in Africa (Congo, Cape Verde); Eastern Europe (Slovak Republic, Macedonia), and in the Middle East and North Africa (Morocco, Jordan, Tunisia).

**Figure 2. Sub-national government share of public investment, 2010**

Source: Viñuela (in this volume.)

These aggregate numbers also hide other important facts. There are large up-and-down-swings and volatility in the level of decentralized investment spending. Countries usually register considerable changes in spending both in GDP terms as well as in the overall share of decentralized public investment, both across years and within years. This is due to a mix of factors:

- Public investment is an important fiscal adjustment variable. It is often the first expenditure item to be cut down or to be increased—for both practical and political reasons.
- Given the often considerable shares of co-financing, which can be allocated competitively, funding for public investment is by nature subject to a high level of unpredictability.
- Subnational governments themselves may have different preferences and needs. This is the original idea of decentralized government—and given the relative degree of flexibility in the nature of resources often being used, it facilitates the definition of own priorities.
- More recently however it has become evident that spending levels and speed of execution of investment can be induced and incentivized from higher levels of government, including the center. Such changes were particularly pronounced in the years following the economic crisis ensuing 2007/2008. Countries such as South Korea or the Czech Republic have responded with stimulus packages executed through subnational

governments, and have increased the level of expenditures considerably.<sup>8</sup> About three-quarters of the investment package announced by Korea and Spain was to be delivered by the subnational jurisdictions (Allain-Dupréé 2011). Other countries, in turn, have done significant adjustment efforts and cut back expenditures, among them some hard-hit countries in Eastern Europe (Armenia, Estonia), and a series of OECD countries (Switzerland, Austria).<sup>9</sup>

- Countries employ different strategies as to what extent the risk of macroeconomic volatility is shared among levels of government; this determines the degree of predictability and stability with which transfers are being transferred. At the same time this can result in pro-cyclical spending patterns, only to be affected later by adjustments if transfer amounts fall back under predicted levels; fiscal responsibility rules can also play a role in explaining these trends.
- Finally, natural resource rich countries can experience substantial changes in the level of public investment, as demonstrated by Peru's commodity boom and the involvement of subnational governments. But if stop-and-go implementation of infrastructure works is the result, the impact on expenditure efficiency becomes problematic.

Given these context factors, subnational governments have to maneuver through a series of obstacles to achieve quality spending. On what factors then, does success in raising the quality of spending depend? As highlighted in **Paper 3 by Lorena Viñuela entitled “Decentralized Public Investment: Trends and Quality of Spending,”** a critical factor is the strengthening of subnational own revenue efforts, both related to the decentralization of tax administration and tax autonomy in the structure of taxes. This does not come as a surprise since a key tenet of own revenue decentralization is that it creates an accountability nexus and induces more fiscally responsible expenditure decisions. Viñuela also finds that reducing opportunities for corruption and enhancing transparency reduces opportunities of wasteful spending.

But achieving quality of spending also requires an understanding of the specific challenges related to the assignment of responsibilities, funding and equalization, topics to which we now turn.

### *Section 2: Fundamentals in Flux: Functions, Finance, and Equalization for Decentralized Public Investment*

The shifting nature in the assignment of responsibilities: The decentralization of infrastructure challenges some of the well-accepted principles of intergovernmental fiscal relations. This holds true for both revenue assignments and the assignment of functional responsibilities.

The assignment of responsibilities over infrastructure represents a triple challenge: it requires not only defining (i) who is responsible for the “end-service” to citizens (health, education, transport, etc.); but also defining (ii) responsibilities over the project and investment cycle (appraisal;

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8. Stimulus packages accounted for 4% of GDP or more in some OECD countries (Australia, Canada, Korea, United States), with a strong focus on public investment, including labor-intensive infrastructure in sectors such as transport and urban utilities and on subnational levels of administration for the implementation of investment programs.

9. This crisis-driven expansion in investment is nevertheless losing impetus as support packages are unwound in some countries and as a result of ongoing fiscal consolidation in several OECD countries (OECD, 2012; Blöchliger 2010).

project selection; budgeting; procurement; ex-post evaluation, among others); and (iii) regulation as a cross-cutting task. Each of these three different responsibilities can be centralized, decentralized, or shared among levels of government. This does represent not only a major alignment and accountability issue, but also, for practical matters, a significant sequencing challenge during a process of aligning responsibilities.

- (i) **Responsibility for “end-services”:** In principle which level of government is assigned responsibility for infrastructure provision depends on which level is assigned “end-responsibility” for the service in question. But there are important differences: some of the “network infrastructure”, such as roads, streets, bridges, can itself constitute an end-service; this is different from in “point infrastructure”, such as hospitals and school buildings, which require further inputs—such as teachers and health personnel—in order to provide full service delivery to citizens. And infrastructure and those other inputs may be assigned to different levels.
- (ii) **Responsibilities over the project cycle.** These responsibilities primarily refer to planning, appraisal, selection, budgeting and financing, implementation, adjustment during execution, and ex-post evaluation. As projects move along the project cycle, different entities need to be responsible for these tasks. It is particularly noteworthy that given the changing ownership over physical assets (PPP arrangements, or through decentralization) those responsibilities are required to shift, so change is desirable and required to some extent.
- (iii) **Regulation.** This entails responsibility for policy, standards and oversight. Regulation is also necessary for the setting of user costs, access prices or final prices, depending on whether the network provider is vertically integrated and competition is feasible. Given the importance of pricing to investment decisions, the credibility and consistency of the regulatory framework are important determinants of infrastructure investment, among others for PPP schemes.<sup>10</sup>

Given the changing nature of some of these responsibilities, these dynamics can lead to a “hollowing out” of “end-service” responsibilities, impacting negatively on accountability and transparency. The competition aspect in the provision of some infrastructure does reinforce this trend. Recognizing the need for flexibility is highlighted by **Roy Bahl and Richard Bird in Paper 4 entitled “Decentralization and Infrastructure: Principles and Practice.”** According to them, responsibilities need to be clearly defined and monitored, although this represents, as can be expected, a major operational and practical challenge.

Challenges in the financing of decentralized infrastructure: Given the changing nature over responsibilities, the next immediate question is how to finance infrastructure. Financial options for decentralized infrastructure can be, among others: (i) local taxes, (ii) intergovernmental grants and transfers; (iii) user charges<sup>11</sup>; and (iv) debt. Private-sector co-financing (concessions,

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10. Some countries like Brazil have decentralized this regulatory function to the states; while in other cases, such as Peru, this remains centralized, despite the fact that about two-thirds of public investment in this country is executed by subnational governments.

11. De Melo and Sutherland (in this volume) underscore that the scope for user charges depends more broadly on the pricing regime for infrastructure projects and on the willingness/ability to pay of local residents as well as the capacity to collect fees for infrastructure use. User charges are attractive as they can provide more than simply a source of revenue. By putting a price on service provision, user charges can influence demand, which is particularly

PPPs) is an additional modality. As is underscored by **Luiz de Mello and Douglas Sutherland** in **Paper 5 entitled “Financing Infrastructure,”** the choice of financing instrument depends on:

- the nature of the investment (size, revenue-generating capacity, potential for competition);
- the modality of service delivery (pure government provision, concession, PPP);
- the budgetary capacity of the jurisdiction (breadth and depth of own taxes, intergovernmental transfer arrangements, borrowing constraints); and,
- the technical capacity of the jurisdiction to design and negotiate contracts with private-sector providers.

In principle, infrastructure finance faces the same dilemma of vertical fiscal gaps as is the case for “common” subnational service delivery: subnational governments tend to have lower revenue mobilization capacity than the central government. Higher levels of administration therefore participate in the financing of subnational provision through transfers and grants, even when investments are carried out entirely by subnational jurisdictions. More emphasis is generally put on debt financing, required to finance costly investment projects which generate future benefits to the population and yield a revenue stream that can be used to service the debt.<sup>12</sup>

These particular financing sources and the array of possible arrangements give rise to at least four specific issues and challenges.

- (i) **Assignment challenges.** Finance sources need to be flexible to adjust to the regulatory and assignment challenge: given that responsibilities are often “in flux”, so does—or should be—the financing. This is more challenging with regards to multi-year budget commitments.
- (ii) **Transaction cost challenges.** (a) Grants may be complex to administer and involve transaction costs (matching grants; co-financing). Matching requirements are typically used to reveal the policy preferences of the recipient, and for effective co-funding and risk sharing. The conditionality in capital grants typically focuses on assuring certain conditions *ex ante*, such as verifying technical feasibility, impact analyses, cost-benefit assessments or the capacity to administer the project. And the allocation of such grants requires priority setting through cooperative arrangements. However surveillance and cooperative pacts often remain a central responsibility, especially in the developing world. (b) Coordinating such co-financing effectively is a serious challenge because these institutions typically compete with each other; they could “crowd out” secured funding (jeopardizing “additionality” of spending by subnational governments); favor “bankable”

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attractive for congestible public goods. Pricing can help internalize environmental and other externalities. The externalities can be significant for some types of infrastructure typically provided by subnational governments, such as water supply and wastewater. In practice, however, pricing infrastructure and associated services often fails to cover operating costs, let alone capital and external costs. Full-cost recovery remains rare, especially in developing countries.

12. Borrowing costs tend to be higher for subnational governments than the central government. Subnational governments, especially in developing countries and emerging-market economies, often face restrictions on borrowing in the form of outright bans (such as on foreign borrowing, for example), administrative restrictions (such as central government approval) and/or prudential regulations (such as limits based on debt service capacity and debt ceilings).

assets with immediate and higher returns (thus “betting on the same horse”); and they impose conditions that may interfere with the political priority setting of local authorities.

- (iii) **Efficiency challenges.** (a) Revenue earmarking—often used for roads as well as social expenditures—often complicates expenditure management and discourages efforts to improve the cost-effectiveness of government expenditures, because policymakers are unable to reallocate scarce budgetary resources to cost-effective activities. They may result in excessive funding in some places, and in too limited funding in others. (b) There are potential efficiency losses associated with the different treatment of operating and capital cost needs of subnational governments: a separated treatment can lead to deferred maintenance; or local managers might try to save on operating costs by not performing (or deferring) maintenance at the proper time without perceiving, or trying to shift to another level of government, the incurred capital costs of this strategy.
- (iv) **Fiscal responsibility and contingent liability challenges.** (a) Sunk costs associated with “poor” infrastructure projects are often too high to be fully financed by subnational budgets, whose revenue mobilization and borrowing capacity is lower than that of higher levels of administration. This may constitute an enforcement problem of fiscal responsibility rules, independently of whether they are based on administrative controls or market mechanisms. (b) PPPs are usually too complex to be administered by subnational governments, particularly given that sub-central governments effectively are not often providers of last resort for very visible public goods. Therefore, mechanisms to minimize the potential for opportunistic behavior from both parties and costly renegotiation need to be considered, notwithstanding the need for flexibility.

As is underscored by de Mello and Sutherland, these challenges require constant adjustment, tailoring to specific projects, and localities. But given that infrastructure has an important temporal dimension it is critical that capital financing be timed and provided in the ‘right’ way if the ‘right’ projects are to be carried out in the ‘right’ places.

Addressing horizontal inequities: With infrastructure gaps shifting among urban and rural areas with quickening pace, the need for “place-based” responses to the service delivery challenge are increasing. Socio-economic dynamics of urbanization also imply changing fiscal capacity, costs, and needs among the jurisdictions of a country, so horizontal disparities and hence the need for equalization is increasing. Hence equity concerns regarding the geographical distribution of capital infrastructure are paramount. Ideally, financing instruments would create the incentives for place-based responses but they would also take into account either existing disparities in capital stock, which are unrelated to the own decisions of the subnational government, or significant disparities in financing capacity or expenditure needs.

To the extent that the main objective of intergovernmental grants, and more in particular equalization transfers, is to ensure the adequate financing of decentralized functions in an equitable manner, it is clear that this adequacy should be assessed in terms of the entire expenditure needs which include capital infrastructure. However, this broad consensus in the theory and practice of fiscal federalism has been, as of yet, mainly focused on the recurrent expenditures needed to finance those public services. As highlighted by **Jorge Martinez-Vazquez and Andrey Timofeev in Paper 6** entitled “**Capital Infrastructure and Equity**”

**Objectives”**), once taking into account the infrastructure dimension, the criteria for equalization become more complex:

- The potential use of user charges (which typically cannot be recognized in fiscal capacity equalization), and access to debt financing (for which high income territories have more access) can create “new sources” of inequities.
- Differences in access to borrowing sources and the costs of borrowing bring inter-temporal issues that can be hard to address explicitly and correctly in the context of general equalization grants (traditionally focused on recurrent expenditure needs and financing means.)
- Cost- and time-overruns have a direct budgetary impact. Cost-drivers, which in the case of infrastructure can be considerable and highlight transparency problems, can accentuate lack of transparency and perverse incentive issues if they are used as a base for cost equalization. But, of course, not all cost overruns are planned or intentional, and therefore there is no straightforward way in limiting these contradictory effects.

Given these factors, placing the different subnational units on equal footing through fiscal equalization does not work uniformly well in all sectors. Perhaps not unsurprising, most countries have faced limitations in crafting responses to the equalization challenge regarding infrastructure, or if there have been responses, they have been developed on parallel tracks with other objectives which may not necessarily go hand in hand with the objective of equalization:

- The so-called Social Investment Funds are often caught between competing objectives: compensating for needs across sectors or across jurisdictions.
- National co-financing is often driven on ad-hoc basis, particularly under competitive schemes.
- The new wave of performance based transfers, adopted widely in developing countries, can exacerbate horizontal inequities.
- Compensating objectives of capital transfers remain often diffuse; earmarking is difficult to enforce in practice, so the equalizing effect is uncertain.

Such responses naturally will have to vary according to the level of decentralization of investment spending. In turn, in some deconcentrated or delegation models, equalization has to come—in theory at least—more from centrally steered programs; municipalities in Chile for instance merely spend about 4 percent of the total, but a much larger share is executed centrally via deconcentrated regional governments. In countries with a high involvement of subnational governments on infrastructure spending—for instance France (about 87 percent), South Korea (84 percent), Spain (about 75 percent), or Peru (67 percent)—equalization is likely more effective and achieved through transfer schemes, oftentimes between autonomous agents.

Ensuring equalization for investment expenditures in many cases therefore will remain a challenge—although countries are applying different models which can be taken as references to guide the design and implementation of policy in this difficult area. The need for mixed and flexible approaches also is underscored by the fact that there are important differences across the different sectors, their financing needs, and the role different forms of financing play in the pricing of services, if any, and in the modality of service delivery.

### ***Section 3: Sectoral Perspectives***

#### Point versus network infrastructure:

As mentioned above, it is useful to divide infrastructure into “network infrastructure”, such as roads, streets, bridges, electricity, and water; and “point infrastructure”, such as hospitals and school buildings, which is more common to the social sectors. The latter often require further inputs—such as teachers and health personnel—in order to provide full service delivery to citizens.

There are noteworthy differences across these two types of infrastructure. For “point infrastructure,” in particular, the locational decisions are paramount: where should a service facility be built, and then also maintained and operated? And who decides the location? While “network infrastructure” cannot obviously ignore such decisions, the failure of doing so and the consequences of poorly connected physical assets can be more visible and therefore can act as deterrent.

The complexity of locational decisions can be illustrated in the health sector. Health can be categorized as a “point infrastructure” service. As emphasized by **Bernard Dafflon and François Vaillancourt** in **Paper 7** entitled “**Investing in Health Infrastructure: How Decentralization Matters**”, the key questions with regards to a locational decision are the following. To begin with, there needs to be clarity on who decides which health and hospital services are attributed to primary, secondary and tertiary health centers. Subsequently, the decisions are: First, how is vertical coordination secured? Second, appropriate distances to service centers must be set in order to optimise the network. Third, are private clinics and hospitals are considered part of the health network, under what conditions?

In addition, most “point infrastructure” requires connectivity to certain types of “network infrastructure” such as roads, electricity and water supply. It is clear that such basic connectivity needs to exist: the utility of a hospital without road access is extremely limited. In “point infrastructure” services in particular, such as education and health facilities, there is a requirement of other inputs to deliver the service, such as personnel (teachers or health workers) and supplies and materials (books or medicines), which complicates management and decision making in several dimensions. The perennial questions are if responsibilities for infrastructure and operation and maintenance be assigned to the same level or different levels; and the implications of those decisions for optimal input combination and cost minimization in service delivery.

Multiple agents: To make matters more complex, the organizational logic of each sector also differs and has implications, particular in defining responsible agents. In education the provision of the different levels of service—that is, compulsory versus higher education—is usually carried out by separate agents in different locations; in turn, in the health sector different levels of service are provided by the same agent such as local health centres; and similar arrangements can be applied in the road sector, given that there are often similar providers for primary and secondary roads.

These different agents again can have their own priorities, not only for asset creation but also with regards to combining necessary inputs and current expenditures. This is underscored by **Alec Gershberg** in **Paper 8** entitled “**Educational Infrastructure, School Construction and**

**Decentralization.”** Often these decisions can be politically driven and, for example, “attractive” infrastructure be created without the necessary teacher allocations or the means (or incentives) to maintain the newly built infrastructure.

Coordination and competition: From the above it is clear that infrastructure implies and requires a complex web of vertical and horizontal coordination. Spatial horizontal coordination is needed between service jurisdictions that deliver the same baskets of services. Vertical coordination is needed not only from the territorial point of view, but also for the assignment of particular service attributes to each governmental layer.

Competition aspects can make coordination challenging, but it is important to bear in mind that competition may be desirable and actually warranted in some sectors; its effectiveness ultimately may depend on the organizational model adopted in a particular country for service delivery. Particularly in the health sector, public service providers are more often in competition with private providers than is the case for roads or even education. There is not only competition between private and public hospitals/clinics in a given territory/jurisdiction but also potential competition across jurisdictions between public hospitals.

The role of the financing levers: Given the complexities above it would seem reasonable to leverage financing instruments to induce coordination, and also to clarify expenditure responsibilities. This possibility is more straightforward in the road sector, as underscored by **Simon D. Ellis and Aurelio Menendez in Paper 9** entitled “**Investing in Road Infrastructure.**” Earmarked grants for maintenance can be used to maintain levels of funding for this critical management responsibility, and in addition this can be done with the objective of equalizing maintenance needs. Similar approaches can be used in the other sectors.

However, the extension of this operation principle may not be universal. For example its application to the health sectors is not as straightforward. Health services call for differentiated and nuanced approaches to financing infrastructure: on the one hand, there is the objectives of universal access, emergency services and hospital network (“collective health”), and, on the other hand, there are individual curative services (“private health”). Clearly, these services require different types of funding, which can have far-reaching consequences over health services as a whole.

The challenge of shifting responsibilities:

All sectors in turn seem to be based on shifting responsibilities during the investment cycle. Planning for a new facility may be initiated by a local group of potential users, by a local politician or central deconcentrated administrator, and then be formally accepted by the sector agency, ministry, or subnational government. In general, it is not always the case that the entity that plans, appraises, and provides the budget, is also the one that implements or later also operates the facility. Often, there is required hand-over of assets as construction is completed and operation starts. Indeed, changing ownership of infrastructure over time is often required, particularly under private sector financial arrangements.

Similarly, some sectors may see different agents taking a leadership role in different steps in the project cycle. Subnational governments are then only one among the many different entities potentially involved: community-based organizations, NGOs, and social funds, all can play a role. In weak capacity environments, delegation to contract management agencies can also play a

role. In addition, making use of some parallel and asymmetric application of organizational models can ensure some level of efficiency for decentralized infrastructure. Such approaches seem to be relevant for most sectors, particular when capacities are uneven across the different territorial units.

#### ***Section 4. Investing into the Invisible: Management and Coordination of Decentralized Public Investment***

The Investment Cycle: From the above it implies that one needs to drill-down into the investment cycle to understand the incentives at play, as projects move along the different stages. This is highlighted by **William F. Fox and Matthew N. Murray** in **Paper 10 entitled “The Challenge of Operating and Maintaining Infrastructure”**, who provide substantial evidence for these incentive dilemmas.

**Planning and Appraisal.** Credible ex-ante appraisal can be limited in local planning processes because local politicians have little incentive to adopt an exercise that may constrain their autonomy in political decision-making. So, even if a local infrastructure project is selected through a participatory process, it may not be informed by evidence from even basic project appraisal. Local planning may, therefore, lead to capital development programs that are exclusively driven by the resources available and the urgency to spend on popular projects with widespread benefits. There is however a necessary differentiation: risks of costly technical “errors”—some of which can be intentional—can theoretically be more limited for “off-the-shelf” projects (e.g. education, health care, administrative and other building facilities) that rely on standard designs, but in turn may become exceedingly high for certain projects (e.g., irrigation schemes, water supply systems, flood control and hydraulic structures) with site-specific design considerations and engineering.

- (i) **Selection, Budgeting and Financing.** Where funding possibilities are limited, and local authorities operate under strong incentives to distribute resources widely for immediate political gains, there can be a trend towards fragmentation of local investment programs and a bias in favor of small, quick and simple projects, with little connection to a well-grounded local development agenda. On the other hand, the prospects of undertaking larger infrastructure projects through co-financing with central agencies are limited by the reluctance of local politicians to lose control of the project, and, as outlined above, weak incentives for inter-agency coordination
- (ii) **Implementing local infrastructure.** Procurement is the most critical step during implementation. A common and major problem is insufficient national attention to developing appropriate local authority procurement systems and capacity. Standard legal provisions and guidelines often largely reproduce at the local level the requirements of the central procurement process. This approach can lead to an abuse of exceptions and fiduciary risks, which can be widespread without effective enforcement mechanisms and actions. The approach can also create incentives to artificially break projects into several contracts of smaller value and thereby work around the standard low thresholds beyond which competitive bidding is mandatory.<sup>13</sup> With limited incentives to supervise and

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13. This has been well documented in many cases and most recently on an insightful report on local government procurement in Bangladesh. See Abrams, Hafiz and Sung Kim (2010).

monitor execution, and breaking larger projects into tranches extending implementation over multiple years, this can lead to delays that increase costs and reduce benefits.

- (iii) **Operation and Maintenance.** Despite the convincing arguments for making greater use of maintenance funding and joint budget decisions, there are several challenges which explain the often lower than optimal level of maintenance.
- First of all, there could be lack of clarity over the asset ownership, particularly in a decentralized setting. Consequently there can be confusion over which level of government is responsible for its maintenance.
  - Furthermore, O&M are both substitutes (in financing and political decisions) and complements (in a technological dimension). In particular, greater capital investments require greater operations and maintenance; also altering the type of investment, such as building more expensive cement rather than asphalt roads, can sometimes reduce the necessary maintenance – that is, they are not simply components of a fixed proportions production function.
  - In a decentralized setting, in particular, there could be preference variation, along with limited user support and demand. Preference variation will surface if asset management responsibilities are unbundled; in addition, in some localities, there may simply not be sufficient user demand and willingness to pay to support the required operations and maintenance.
  - In some services there could be lack of an effective signaling device for the level of use of some assets, (urban streets, for instance) and hence lack of ability to assess their deterioration.
  - Finally, rent extraction for political and personal gain may accrue from the diversion of operations and maintenance expenditures to other uses. Politically, decentralized governments may play the strategy of implementing low maintenance in the hope that the central government will intervene and replace the capital infrastructure. There may be also waste and inefficiencies through the contracting process.
- (iv) **Ex-post evaluation.** There is a general paucity of systematic ex-post evaluations in most settings. This can be explained by the lack of interest for being self-evaluated on performance and by the fact that given the long life of many infrastructure projects it may be far from clear who needs to be held accountable. But it is also the case, however, that mapping out accountability over results and outcomes is often cumbersome, particularly given the multi-year nature of projects where shifting responsibilities and accountabilities are more acute.

As a result of all the above, it is not surprising that there is often an “optimism bias” in investment projects: costs are estimated low to fit into local budgets, but projects once implemented, turn out to be much more expensive. This requires an upfront recognition of this bias and a systemic approach to undercut those incentives. Some countries, for example South Korea, have demonstrated impressively the possibility to change behavior by signaling agents ex-ante that projects with cost and time overruns above a certain threshold will be re-appraised at a later stage. Such approaches, however, are not too often applied at the subnational or intergovernmental level. As a first step, this would require increased effort to monitor progress and all stages of the investment cycle. But as discussed by **Ha T.T. Vu and Robert D. Ebel in Paper 11** entitled “**Multi-Tier Monitoring of Infrastructure: Top Down and Bottom Up**”,

organizing such a cross-cutting function is complex by itself, and in intergovernmental setting it is even more challenging because of the high levels of co-financing, which itself raises questions over responsibilities and accountability.

Coordination: Coordination issues therefore seem to be emblematic for decentralized public investment, in both vertical and horizontal dimensions. Vertical coordination includes infrastructure decisions, financing, implementation, and other aspects of management across levels. Horizontal interaction, among subnational governments, is required when there are positive or negative external spillovers; when scale for infrastructure projects goes beyond administrative boundaries; and when policy makers seek to realize potential complementarities across sectors. As highlighted by **Claire Charbit and Cathérine Gamper** in **Paper 12** entitled **“Coordination of Infrastructure Investment across Levels of Government,”** political economy constraints often lie at the heart of coordination failures, and these can be further driven by information asymmetries; uneven institutional capacities; and limited subnational autonomy over resources and infrastructure policy—which is, in fact, a pre-requisite to be able to coordinate in first place. It seems highly worthwhile to further invest into these invisible, often neglected, but at the end critical aspects of infrastructure management.

### ***Section 5: Political Economy and Corruption Challenges***

Political Economy: As a process which establishes localized benefits, decentralized infrastructure provision is particularly exposed to political economy incentives. It is not clear that all of these interests would support efficient provision of infrastructure; nor do these interests provide any guarantee that management and decisions on infrastructure provision are actually being decentralized. This is highlighted by **Leonardo Romeo and Paul Smoke** in **Paper 13** entitled **“The Political Economy of Infrastructure Planning.”** These authors conclude that local politicians may overlook the identification of larger, more complex projects that support a strategic development vision for the locality and the wider region. But addressing these shortcomings would require greater efforts over a multi-year horizon to build institutional partnerships and mobilize additional resources. If such conditions are absent or weak, infrastructure planning then is reduced to the preparation of “free-standing” local capital programs that have little connection to upstream strategic plans or to downstream work-programs of the local administration’s departments.

Corruption: These sets of incentives will vary according to the country context and its governance. In “limited access” political systems prevailing in less developed countries funds for public investment are necessary to extend patronage networks and effect the intra-elite distribution of rents, which in turn may be essential for managing the risk of violent conflicts between elite factions and maintaining the stability of the political system (North et al. 2006). This makes it particularly challenging to define a “dividing line” between transparency and corruption.

Indeed, as concluded by **Anwar Shah** in **Paper 14** entitled **“Decentralized Provision of Public Infrastructure and Corruption,”** opportunities for corruption can be identified in nearly all sectors of service delivery and infrastructure provision (Table 1). While corruption is country- and locality-specific, it can range from petty, administrative or bureaucratic corruption to grand

corruption, to state or regulatory capture and influence peddling, and to patronage and paternalism.

**Table 1. Vulnerability to corruption in the provision of infrastructure in various sectors**

Water and Sanitation	Land acquisition, Selection of contractors, bid rigging, compromising quality, bribes for connections, meter tampering, conflict of interest with officials involved in private provision, collusion with companies offering bottled water or tanker provision.
Roads	Land Acquisition, rehabilitation, Selection of contractors, false procurement and maintenance expenditures, quality of construction
Electricity	Public utilities: Land acquisition, rights of way, rehabilitation, equipment purchase and repair mark ups, patronage appointments, defective meters, meter tampering, theft of electricity by tapping distribution lines with side payments, connections delays, false billing, response to non-payment of bills, false subsidy payments. Private utilities: Selection, regulatory regime, price hikes, blind eye to capital deterioration
Hospitals	Ghost hospitals, false procurement and construction,
Schools	Ghost school, false procurement and corruption

*Source:* Anwar Shah (this volume).

The decentralized provision of infrastructure holds the promise of curtailing corruption provided there is no elite capture, that there are strong institutions of accountability in governance, a results-based governance culture, and an educated and empowered citizenry. These ideal conditions are absent to varying degrees in most countries. This means that there is a need to tailor institutional design for integrity to specific country and locality conditions in order to increase transparency, which has been identified as a key factor for improving the quality of spending in infrastructure.

#### IV. From Gaps to Solutions: Policy Options and the Way Forward

Understanding how subnational governments can move from “infrastructure gaps to solutions” is the key motivation of this book. Given their “proximity to the gaps,” they are often best suited in detecting them in first place and in crafting the most adequate solutions. However, as has been underscored throughout this introductory paper, the role of subnational governments varies considerably depending on country, sector and even local, settings.

##### *Decentralized Infrastructure and the Intergovernmental Strategy*

While overall country strategies for decentralization are often difficult to design and implement, it is also true that policy advice for intergovernmental relations has been consolidating significantly in recent years and there is now a useful and robust catalogue of “best practices” available. Three principles which have been emerging as nearly universally applicable are immediately relevant for the infrastructure challenge—gradualism, flexibility, and asymmetry, —but they need to be enhanced and amended sensibly so that the particular relevant infrastructure issues can be addressed.

- (i) Gradualism: tailored as a quick gain strategy. A key principle for implementing decentralization is that it should proceed gradually and step-by step, among others to cater to uneven capacities. Infrastructure however might require a different approach through a “quick gain” strategy. The rationale is to set a precedent for reform, creating self-sustained dynamics. This can be done by selecting individual sectors, or individual steps in the project cycle. For instance, roads can be a priority sector given that contracts

can be based on more easily identifiable outputs. Likewise, procurement can provide for quick gains in efficiency as well as transparency as it is an area easily vulnerable to corruption. Irrespective of the particular entry point selected, a quick gain approach needs to create a winning coalition in a path of successful rounds of bargaining, leading eventually to more efficient management.

- (ii) Flexibility: tailored to sectors and projects. It has long been recognized that decentralization needs to be flexible, adapting to the institutional, political as well as social context of a country. Infrastructure decentralization might follow primarily a sector-approach, tailored to individual projects. As a cross-cutting, multi-agency, and multi-level process, there is otherwise the high risk that efforts for improved infrastructure management will fail due to “lack of traction” and “lack of demand for reform”. This can be the case in a “territorial” approach which aims at transferring power in several sectors to individual subnational governments.
- (iii) Asymmetry: tailored to gaps. Given uneven capacities and demand for decentralization, power and resources are in most cases managed asymmetrically across the different jurisdictions, reflecting different depth and scope of decentralization. For infrastructure, the urban-rural divide is particularly relevant. It would be useful to tailor differentiated responses, one the one hand, to the large urban and metropolitan governments, and, on the other, to smaller rural governments, perhaps complemented by even an additional differentiated approach for some of the emerging intermediate cities and secondary towns.

It is clear that this type of strategy will not be free of tensions, and significant trade-offs will need to be negotiated. This can and should be done within the several policy domains that follow below

### *Specific Policy Options*

There are five specific policy areas which merit further attention: (i) responsibilities in end-services; the investment cycle, and regulation; (ii) setting incentives for the whole investment cycle; (iii) increasing capacities; (iv) enhancement of horizontal equity; and (iv) strengthening coordination.

#### **A. Getting a hold on shifting responsibilities**

In an intergovernmental setting, all starts and ends with defining appropriate expenditure responsibilities. This should encompass the three types of responsibilities relevant for infrastructure: (a) the “end-service” to citizens (health, education, transport, and so forth); (b) responsibilities over specific steps in the investment cycle; and (c) regulation as a cross-cutting task.

a) **Defining end-level services.** The importance of defining “end-services” cannot be sufficiently underscored. This has been a perennial challenge for any intergovernmental system. But there are several aspects which are relevant for infrastructure:

- **Unbundling.** It is useful to unbundle infrastructure services so that those sub-functions not characterized by clear advantages of centralization might be assigned to subnational governments. Costs could be reduced by disaggregating infrastructure expenditures into

components, and making assignments on the basis of comparative advantage. For example, while perhaps technical specifications required to ensure water quality might be a matter of national concern, the construction of major water supply and sewage lines (like interurban highways) may best be handled at the regional level, and local distribution lines might be the responsibility of local governments.

- **If a service has been assigned to subnational governments, limit interference from upper level governments that may increase costs.** Interference by higher level governments, for example by imposing mandates, should be limited to concerns about externalities, and perhaps the regular monitoring of maintenance.
- **Use advantages of all levels of government for a vertical assignment.** The intermediate (or regional) tier is often given less emphasis for service delivery in decentralized systems. A regional level can have genuine advantages, particularly for the assignment of overarching functions. This could integrate more effectively externalities and address economies of scale.

**b) Defining responsibilities over the steps in the investment cycle.** It seems necessary to define responsibilities for individual steps, in order to tackle the origin of the “hollowing out” of responsibilities. As pointed out above, procurement seems, by and large, the most effective way in reducing corruption opportunities. A differentiated approach by which non-standard bidding procedures are centralized can avoid situations where corruption is facilitated by weak capacity often prevailing at local levels. Another area is operations and maintenance: it would be useful to explore different organizational models, including private, public, and community-based operations and maintenance.

**c) Defining responsibilities for regulation.** Given that traction for reform is likely to be higher in individual sectors, regulation may need to prioritize a sector-approach. Regulation aspects should be clearly spelled out so that the route for a project through the individual approval steps is straightforward. Some countries have advanced with simplification, creating thresholds by size of projects (monetary values), or for individual type of projects (repeater projects; module projects), which then may or not require special treatment. Such approaches should be further explored, without creating loopholes in transparency.

Provided there is no elite capture and there are credible regulatory agencies, unbundling infrastructure services for market competition should be considered. By isolating the natural monopoly segments of the sector, one can examine range of market alternatives for unbundling rest of infrastructure provision. This includes regulatory framework that encourages: (i) competition for substitutes; (ii) competition for infrastructure markets; (iii) competition for the right to supply the entire market through leases and concessions; (iv) privatization of some monopolies to reap efficiency gains. It is clear that such approaches can be more effective in urban areas, as compared to many rural areas where competition may simply be absent.

## **B. Set incentives outright for the whole public investment cycle**

Public investment needs to be treated systematically, as weaknesses in one step of the investment cycle may undermine capacity in another step. The following are useful guidelines:

- **Selecting strategic entry points based on the investment portfolio:** if there are particularly high number of new investment projects (particularly frequent in natural resource countries), it makes sense to focus on transparent management of these steps; in turn, it might be more effective to focus attention on implementation. In general, it seems efforts at ex-post evaluation are the weakest chain in the project cycle, and there is no straightforward way to address this challenge.
- **It will be useful to signal to actors in an ex-ante fashion that their behavior has consequences ex-post.** Allowing and encouraging project redefinitions by setting thresholds for cost- and time-overruns can signal to actors that effective planning and appraisal are necessary. This will help to weed out “poor” projects in the initial steps before they get funded and gain further support. South Korea has implemented such proceeding with great success.
- **Creating pressure from the private sector.** Initiatives like the Construction Transparency Initiative (CoST)<sup>14</sup> involve private sector companies to reveal information about contracts. In settings where the public sector is reluctant to cooperate, this can create the relevant incentives from one “receiving end”.
- **Strengthen demand from end-users.** Given overall limited possibilities to get traction for reform in processes which span several agencies and several layers of government, it seems key to strengthen the demand from end-users of public services or infrastructure works. Modern information technology (reporting through cell phones, websites) can help create immediate “transmission belts” to implementing agencies to report on delays or poor delivery of services.

### C. Enhance Institutional Capacities

Infrastructure provision is a cross-cutting process requiring specialized capacity. Such capacity can be limited either at individual levels of government, or across the different subnational units. Here again there are useful guidelines that can be followed:

- **Create specialized capacities for public investment—but of an intergovernmental nature.** Institutional capacities today—whether in financial management, human resources or procurement—increasingly require shared approaches which go beyond individual levels of government. Procurement systems, monitoring arrangements, and ex-post reviews, can be done as shared undertaking between levels of government. Further rolling out financial management systems, and building them as “main systems” capturing information on procurement and public investment across several levels of government, can contribute to reducing transaction costs while increasing transparency.
- **There is room for creating special-purpose districts or bodies** (e.g. for river basin management, mass transit, irrigation, conservation, sewerage, solid waste management, water supply, and other utilities). This could be tailored to serving local needs better than through a central provider—but gauged against the risk of creating coordination challenges.
- **Create support mechanisms for increased capacity.** Capacity creation can only be place-specific. Subnational governments should not perceive implementation monitoring

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14. Further information is available at [www.constructiontransparency.org](http://www.constructiontransparency.org).

as a sanction, particularly if low capacity is the underlying cause. Technical support should be dispatched if delays in implementation become apparent; systematic implementation monitoring precisely can flag problematic sectors or subnational governments. A mix between top-down learning, and horizontal, peer-to-peer learning within a community of practitioners can be useful approaches applicable in a wide range of contexts.

#### **D. Enhance equity**

Disparities in the stock of capital infrastructure have a direct impact on the equal opportunity in access to basic services and can be damaging to the efficient allocation of productive resources in the economy by generating unwarranted migration. However, the different objectives pursued by intergovernmental policies can significantly condition the appropriate interventions to address those disparities. For example capital transfers policies can be designed to address differences in access to public services, or longer term regional disparities in economic development, or the presence of significant externalities across jurisdictions. In this sense, an equitable distribution of infrastructure at the subnational level needs to be interpreted in the light of all other government policy objectives, and therefore not all disparities in the spatial distribution of the stock of infrastructure need to be addressed from a balanced view of the equity objective. But it is clear, that from an equity perspective infrastructure spending in general does not deserve any special attention or priority separate from the ultimate provision of public services-- which requires capital infrastructure as inputs.

From a policy viewpoint, the relevant question is on the most appropriate form of intervention. In particular, should disparities be addressed with conditional capital grants, be incorporated into the general-purpose equalization grant, or through credit facilitation policies? The right answer is likely to depend on the type of infrastructure and may also vary with specific circumstances, such as subnational capacity and credit availability.

- In the case of infrastructure for social services, such as health and education, the different needs may be incorporated into recurrent equalization grants because of the large presence of operation and maintenance costs.
- In the case of infrastructure that is largely fee recoverable, such as in the case of utilities, credit facilitating policies may be the most adequate.
- For network infrastructure that is largely non fee-recoverable, such as no-toll roads, a conditional grant may be most appropriate.

#### **E. Strengthening coordination: from signaling to contracting**

Coordination is key for making infrastructure provision efficient, equitable and sustainable. It is required vertically (across tiers of government) and horizontally (across jurisdictions and agents). Coordination can entail a range of possibilities. Countries and subnational governments should exploit the full range of options.

- (i) Signalling is the weakest form of coordination; this is done, for instance, through earmarking of funds. In practice it is difficult to track the use of funding; and to enforce signalling.

- (ii) Conditionalities can be attached to certain services or projects (for instance, coverage and quality targets; operational efficiency targets).
- (iii) Contracts among levels of government—as used in OECD countries—are typically used for multi-sector outcomes in a variety of services. In the case of partnerships it is needed to make both common objectives and each party's commitments clear.

Risks entailed in coordination need to be mitigated. It is important to ensure that they do not simply add to administrative burdens by creating structures that parallel existing administrative processes. For example, conditionality is frequently seen by subnational and central authorities alike as increasing the administrative burden without increasing impact of public investment projects.

## **V. Concluding Remarks**

Sub-national governments around the world play a fundamental and increasing role in the provision of infrastructure. This appears to be a trend which is unlikely to change in the foreseeable horizon. And yet, ensuring provision of infrastructure through subnational governments represents formidable challenges.

This book volume provides clear evidence that these multiple challenges are not easy to be reconciled. Making trade-offs between different approaches need to be recognized openly and up front. Nevertheless, there are many positive examples around the world where infrastructure managed in a decentralized fashion have been improving, and it is worthwhile investing future efforts and further research and data on their factors of success. Likewise, it is worth continuing with efforts to address the knowledge gaps which identified in this book and that are only now beginning to emerge.

The essays in this volume make innovative contributions to the different aspects of decentralized infrastructure provision while providing guidance for improved design with the objective to improve the efficiency and equity of public capital infrastructure around the world. For sure this will not be the last word on the challenges of infrastructure provision in decentralized settings but it is our hope that the volume will help advance the debate.

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