



Tulane Economics Working Paper Series

Municipal Finance of Urban Infrastructure: Knowns and Unknowns

James Alm
Department of Economics
Tulane University
New Orleans, LA
jalm@tulane.edu

Working Paper 1103
April 2011

Municipal Finance of Urban Infrastructure: Knowns and Unknowns

James Alm
Tulane University

1. Introduction: The Importance of Municipal Finance in Providing Infrastructure

Various trends, including an increasing emphasis on fiscal decentralization; political democratization in many areas; globalization and the financial liberalization that often accompanies it; growing demands for urban services as urbanization continues in major cities around the world; all argue compellingly for finding ways to help municipalities finance large-scale infrastructure. Improved urban infrastructure, for water supply, sanitation, urban transportation and solid waste management is widely believed essential in encouraging and facilitating economic growth. Evidence indicates that those countries most successful in sustaining high growth supported their cities with transformative investments to improve urban infrastructure that could accommodate rapid population growth in major economic centers. This evidence suggests that infrastructure has a strong “supply-side” orientation and in practice, it is the effects of infrastructure on “supply” that are most often emphasized. There is also a strong “demand-side” aspect: individuals and businesses value the services that flow from the stock of infrastructure facilities and these demands should be (but are often not) considered in determining the appropriate level of infrastructure investment. In addition to the potential supply-and-demand-side impacts on economic growth, the services of infrastructure also play a significant role in the distribution of income.

Although data are often limited, the extent of the infrastructure “gap” – or the amount of additional infrastructure spending that is needed to provide basic services – is enormous. See Box 1 for a discussion of the quality of infrastructure in Kenya. The experience there is not an isolated one.

Box 1: The Deteriorating Quality of Infrastructure in Kenya

The National Economic and Social Council (NESC) of Kenya recently concluded that the condition of infrastructure was the worst since independence in 1963. Specifically, the NESC estimated that:

- 47 percent of classified roads are unserviceable and need reconstruction
- The condition of railroads is poor, as indicated by the decline in Kenya Railways revenue per km-tonnage by one-third due to lack of equipment and poor maintenance
- Kenya has the highest costs of international phone in the region, saddling Kenya Telekom with inefficiency and outdated technology
- The rate of national access to clear water is only 57 percent, and to sanitation is 86 percent
- Over two-thirds of Kenyans rely on wood fuel for energy, and only 9 percent have access to electricity
- 60 percent of Nairobi’s residents live in slums, and all of the major urban areas in Kenya exhibit a similar pattern.

Source: Nabutola (2006).

Urban infrastructure finance has multiple dimensions. This paper focuses on a limited number of these dimensions:

- Finance for major infrastructure improvements in major economic centers;
- Finance for expansion of basic municipal services in secondary cities and towns; and
- Intergovernmental systems for financing investments with impacts beyond jurisdictional limits.

Also included is a review of current practices, an examination of international evidence and case studies, and a look at areas in which knowledge gaps remain.

The basic—but still quite tentative—conclusions reached in this review are:

- The “theory” of fiscal federalism has many useful and general guidelines. However, the practical and specific relevance of these guidelines remains quite unclear.
- In the specific context of municipal infrastructure finance, there is little in the theory that allows one to determine whether one infrastructure “scheme” is “better” than another. It remains unclear if one scheme could be selected in one scenario and not in another, or will “work” in one scenario and not in another.
- There are numerous examples where one infrastructure scheme works in one institutional setting and not in another, seemingly similar, institution. There are also many examples where countries with similar institutional settings follow very different paths in infrastructure finance. The full effects of different schemes on service delivery, income distribution and poverty reduction are seldom fully quantified or understood.
- The reasons for the differential outcomes outlined above are unclear.
- Despite inconclusive and conflicting observations, there are avenues by which our understanding of infrastructure schemes can be enhanced.
- Overall, the lack of clarity relates to limited available information, which is a serious, widespread challenge.

The concluding section of the review offers suggestions for a research agenda on municipal finance of infrastructure.

2. Dimensions of Urban Infrastructure

It is useful at the start to be precise on what exactly is meant by “infrastructure”. For purposes here, infrastructure will be taken to mean long-lived capital facilities used in providing certain types of services to households and also in providing services that enhance private sector production. “Infrastructure” therefore includes services from water systems, solid waste management, sewer systems, power generating plants, roads, mass transportation, electricity generation, and telecommunications.

Note that this definition focuses on the role of infrastructure in household consumption (e.g., water systems) and in business production (e.g., electricity generation). Infrastructure has an essential role in both dimensions. Note also that this definition emphasizes both the flow of services from the physical facility and the stock of capital that actually generates the service flow. As noted by Fox (1994), there are two major advantages to focusing on the service flow rather than (exclusively) on the capital stock. One is that policymakers are more likely to think flexibly about the best technology for producing the service. For example, policymakers may conclude that encouraging public group transportation, such as jeepneys in the Philippines and matatu buses in Kenya, is a better solution to transportation needs than building roads or constructing mass transit systems. Also, policymakers are more likely to focus on providing the specific services that people demand instead of looking at engineering designs for infrastructure facilities. Note finally that this definition does not distinguish between public versus private infrastructure. If one considers separately the various functions of planning, finance, construction, ownership, operation, and maintenance of infrastructure, then it is not necessary for the public sector to be the sole actor in all of these functions; that is, there can clearly be a combined role for the public, the private, and even the not-for-profit sectors in providing “infrastructure” and its associated services.

3. Infrastructure in “Theory” and in Practice: Decentralization and the Subsidiarity Principle

3.1. The Theory and Rationale of Infrastructure Finance

In a “perfect” world, the provision of urban infrastructure – indeed, the provision of most any local government service – would be a simple process, and would involve the following basic considerations:

- Determine whether the project is justified, by conducting a standard social benefit-cost analysis
- Given the long-lived nature of the capital facilities, borrow the funds necessary to finance the initial infrastructure cost
- Finance the ongoing operations and maintenance expenditures via user costs or other local sources of revenues.

Indeed, the outcome of this process would reflect the basic, underlying rationale for fiscal decentralization generally and for municipal provision of capital projects specifically: the so-called Subsidiarity Principle of Oates (1972, 1993, 1999) and others, also sometimes referred to as the “Decentralization Theorem”. This principle states that government services should be provided by the lowest level of government that can do so efficiently. When tastes, incomes, and needs differ across regions, local governments will be in the best position to determine the expenditure priorities of its citizens, and assigning responsibilities to the lowest level of government allows government services to be adapted more closely to the specific demands of local citizens. The existence of multiple local jurisdictions also gives individuals the opportunity to “vote with their feet” by moving to the jurisdiction that best meets their demands for the appropriate mix of public services and taxes (Tiebout, 1956), at least when mobility exists. Relatedly, when local governments are assigned expenditure responsibilities, they should bear the costs of financing those expenditures because only then will they balance the benefits of public goods with the costs. In this regard, McLure (2006) has more recently suggested a revenue-side corollary to the Subsidiarity Principle, which extends subsidiarity from expenditure to tax assignments: taxes should be assigned to the lowest level of government that can collect the tax efficiently.¹

International experience has shown repeatedly that these general guidelines, while useful in highlighting the main types of considerations, are often applied quite differently, if at all, in different countries; that is, there is no single “best” expenditure (and revenue) assignment. Even so, this experience has also shown that it is important to have a clear and stable assignment across governments, in which the responsibilities of each level of government are clear and unambiguous and in which a mechanism exists both to coordinate provision and to resolve potential conflicts. It is especially important to follow, where possible, the Subsidiarity Principle in the assignment of the allocative function of government. Failure to follow these general principles typically has led to underprovision of government services.² Details of revenue assignment and transfer design are discussed later.

Of course, the conditions under which decentralization actually “works” at the local government level are quite stringent, and include such conditions as:

- There must be a popularly elected local council
- There must be locally appointed chief officials
- There must be a locally approved budget
- There must be an absence of central government mandates on local government decisions on employment and salaries

¹ There are of course mitigating factors here, all of which argue against efficient local government provision. For example, if a public good provides benefits not only locally but across jurisdictions, then a local jurisdiction may discount some of those benefits and under provide the good. In this case, a higher level of government may be in a better position to provide it; alternatively, the central government may need to subsidize local government expenditures. Similarly, there may be cases where services can be provided more efficiently at larger scales than the local jurisdiction. An example may be municipal solid waste: even large cities may benefit from sharing a single landfill rather than procuring their own individually, and even small towns and villages may benefit from sharing a single trash collection service. On the tax side, if a local government tries to tax a mobile factor, the factor can easily avoid the tax by moving outside the relevant jurisdiction, thereby leading to a loss in revenues and causing distortions in the economy. Generally speaking, because it is easier for households, firms, and economic activities to move within a nation than across nations, factors are less mobile from the perspective of a central government than from that of a local government. This may be one reason for central governments to subsidize local governments' expenditures. Finally, local governments may interact strategically, competing to attract and/or hold a larger share of mobile tax bases. This phenomenon has been characterized as a “race to the bottom”, as it suggests poorer quality of public services as local governments collectively cut tax rates.

² For example, if the responsibility for some service like infrastructure provision is not specifically assigned to any government, or if the same responsibility is assigned to multiple levels of government, then it is commonly the case that each level will assume – or argue – that it is the responsibility of the other government (s) to provide the service. The service will then be underprovided, if provided at all.

- There must be a clear expenditure assignment
- Local governments must be able to exert at least some control on the level of at least some revenue sources
- Local governments must have some powers to borrow
- There must be a transparent grant system, in which local governments are able to understand their grant entitlements
- Local governments must have the capacity to collect taxes
- Local governments must have the capacity to deliver services efficiently
- Local governments must have the capacity to keep adequate books of account
- The central government must have the ability to monitor the behaviors of local governments.

These conditions help ensure that local government is responsive to the demands of local citizens. However, these conditions are seldom if ever met, especially in developing countries (Bahl, 1999).

In the context here, if local governments are to be given more independence in their expenditure (and tax) decisions, then such independence should extend to their responsibility for execution of the planning, financing, constructing, operating, and maintaining of all capital projects in the relevant areas that have been assigned to them; that is, the assignment of capital expenditure responsibilities should follow the same criteria as the assignment of recurrent expenditure responsibilities, and for largely the same reasons. Assigning capital expenditure responsibilities to the lowest level of government that can handle them efficiently will improve the efficiency of service delivery by making these governments more accountable to their citizens, subject of course to the same conditions identified earlier.

Indeed, such independence should extend even to local government use of borrowing. In principle, local government borrowing can provide significant benefits, benefits that follow directly and immediately from the application of the Subsidiarity Principle to capital projects. As noted earlier, this principle requires that the responsibility for government services should lie with the lowest level of government whose jurisdiction matches the benefit area of the service. There is no reason why this principle should not apply to the services that flow from capital projects, just as the principle applies to current expenditures. Further, local government borrowing allows the government to align more closely current expenditures with current receipts, an especially important consideration in the face of temporary and unexpected fluctuations in revenues. Finally, given the lumpy nature of investment projects, requiring that they be financed out of current revenues is likely to be inefficient and inequitable, since both current and future generations will benefit from capital projects that last multiple years. In sum, the Subsidiarity Principle suggests that local governments should be responsible for the full range of duties associated with capital projects: planning, financing, constructing, operating, and maintaining.

It is certainly the case that local government borrowing has sometimes created, or at least contributed to, significant problems.³ These difficulties are discussed in more detail later.

However, the failure to allow local governments to borrow can also lead to problems. When local governments have no responsibility for the facilities, then they may find it advantageous to scrimp on maintenance expenditures, believing that the central government will replace existing facilities. Put differently, if municipal governments do not feel “ownership” of their capital facilities, then there is a “moral hazard” problem because it is unlikely that they will choose to invest resources in maintaining them. It is well known in public budgeting and fiscal management that replacement costs are typically a large multiple of funds required for maintenance and even basic rehabilitation (Willoughby, 2000). See Box 2.

³ See Tanzi (1996) and Ahmad, Albino-War, and Singh (2005) for further discussion of the macroeconomic concerns stemming from decentralization. See also Nicolini, Posadas, Sanguinetti, and Tommas (2002) for analysis of these issues in the specific case of Argentina.

Box 2: Maintaining Subnational Roads in Bangladesh

As part of a USAID-financed project in the early 1980s to construct roads in mainly rural areas of Bangladesh by the Local Government Engineering Department (LGED) of the Ministry of Interior and Local Government, a team of economists was also asked to examine the revenue-generating abilities of local governments. The intention of this part of the overall “Zila Roads Maintenance Project” was to improve the capacity of local governments to generate the revenues necessary to maintain the roads. Otherwise, poorly maintained roads would quickly be eroded when the monsoons hit. However, the roads were being built with very little input from the local governments who would be given maintenance responsibilities. As a result, the local governments felt little ownership of the roads and so felt little incentive to maintain the roads that were being given them because they had little at stake in the road construction. Despite the identification by the project of various means of increasing local government revenue mobilization, the local governments devoted little effort to road maintenance, and many of the constructed roads quickly deteriorated. Sometime later, virtually the same scenario was repeated on a World Bank project to build municipal infrastructure, and for the same reasons.

Source: Alm and Martinez-Vazquez (1997).

3.2 What Can Go Wrong?

However, as noted, this “perfect” and “simple” scenario of infrastructure finance never exists. Even aside from the failure of the various conditions for decentralization to be satisfied, what can go wrong?

An obvious problem lies in difficulties in conducting benefit-cost analysis of the proposed infrastructure project. The presence of multiple objectives (e.g., income distribution, correction of externalities, provision of public goods, equal access to services, incorporation of civil society organizations) often clouds the estimates. It is difficult to estimate the social benefits of services that generate in part, say, positive externalities or that redistribute income. The demand for the public services financed by infrastructure may be difficult to estimate because of the lack of true local accountability; that is, there may not be an accurate demand-revealing process that operates via the political process. There may be uncertainty about demand for services, both now and in the future, which makes estimation of the willingness to pay for services difficult. There may also be uncertainty about costs of service provision (e.g., exchange risk), and uncertainty about the appropriate discount rate to apply in the analysis.

Of perhaps more consequence, another problem stems from difficulties in generating borrowed funds for initial infrastructure costs via municipal government access to capital markets. In most countries, municipal government access to credit markets is quite limited. In part this lack of access is due to the non-existence of local government credit markets. However, even where these markets exist, there is seldom useful and reliable information on the “creditworthiness” of local governments, via such common devices in developed countries of a bond-rating system. There is frequently a lack of transparency in municipal government operations that contributes to this.

A final problem arises due to difficulties in generating revenues for ongoing operations and maintenance expenditures. In very few developing countries is there a consistent pattern of efficient cost recovery via user fees. There is typically a higher ongoing cost of operations and maintenance due to municipal government inefficiency, including corruption and incompetence of local government officials. The record of municipal governments in collecting tax revenues from “regular” sources of revenues is also quite mixed. The ability to generate significant amounts of revenues from “innovative” sources of revenues, including municipal government “assets” (e.g., land) is also limited.

In the face of these types of difficulties with municipal government provision of infrastructure, other options are often suggested, including public-private partnerships, complete privatization, or privatization combined with government regulation, as preferred options for provision of infrastructure services. These options are discussed later.

The remainder of the paper discusses the various ways in which municipal governments may act to provide infrastructure.

4. Potential Sources of Municipal Finance for Capital Projects

Municipal governments have many potential sources of revenues to finance the initial construction of capital facilities and also to pay for the operation and maintenance of infrastructure projects. These include:

- Municipal government borrowing from private capital markets via bond issuance
- Municipal government borrowing from specialized financial institutions/intermediaries
- Taxes⁴
- User fees
- Land- and Asset-based sources:
 - Impact fees and development charges (e.g., developer extractions)
 - Betterment levies (e.g., land value capture taxes)
 - Use of municipal “assets” (e.g., land)
 - Tax increment financing
- Central government finance via intergovernmental transfers
- International donors

These sources can be broadly classified into three main categories: borrowing, municipal own-source revenues (e.g., taxes and user fees), and transfers. Of these, some are better suited for the initial finance of infrastructure and some for the operation and maintenance of existing facilities, as discussed in the next section.

5. Identifying “Efficient Financing” of Infrastructure

It is useful in the following discussion to distinguish between the one-time finance of initial capital investments and the on-going finance of operation and maintenance expenditures. Each dimension is discussed in turn.

One especially novel method that does not fit easily into any category is “informal taxation”. See Box 3 for a discussion of this little-examined method of finance.

⁴ A municipal “tax” can be defined as one that satisfies the following conditions:

- The local governments decides whether or not to levy the tax
- The government determines the tax base
- The government determines the tax rate
- The government administers the tax, including assessment, enforcement, and collection
- The government retains the revenues from the tax.

Also, the payment of a “tax” (as opposed to a “contribution” or a “fee”) does not entitle the taxpayer to any specific government service.

Box 3: Informal Taxation

“Informal taxation” refers to contributions made by local residents outside the formal tax system to the construction and maintenance of local public goods, payments that are coordinated by public officials but enforced largely through social customs and norms. In fact, individuals in many communities throughout the developing contribute substantially local public goods such as roads and water systems, both in money and labor, with often complex arrangements determining how much each household should pay and what penalties apply for those who free ride. These systems are called by many different names, such as *gotong royong* in Indonesia and *harambee* in Kenya. These informal payments can be quite large; they are often regressive in their pattern of incidence; and their form differs significantly across countries.

Source: Olken and Singhal (2009).

5.1. Initial Capital Investments

Municipal Government Borrowing.

Municipal governments in most all countries are unable to finance initial capital investments from current savings, and municipal borrowing is the obvious and preferred source of financing for these investments. Borrowing allows local governments to better match current expenditures with current tax revenues, allowing temporary and unexpected swings in revenues to be smoothed without undue disruption in service provision. Borrowing allows local governments to finance public capital projects that are lumpy in nature, and to shift some of the burden of finance to future generations that will benefit from durable and long-lived projects. Most importantly, borrowing allows local governments to construct facilities that more closely reflect the demands of its citizens, thereby moving government “closer to the people”.

In practice, there are two main types of borrowing finance. One source comes from direct municipal access to capital markets via the municipal government issue of bonds. Bond issue as the main source of long term capital investments by municipalities is unlikely to play a significant role given the absence of capital markets for which local governments have meaningful access. Bond issue is especially unlikely for smaller local governments.

A second source, and one that addresses to some extent municipal government access to capital markets, is borrowing from specialized financial institutions. It is common in many European countries to create a financial intermediary (or a financial intermediation program) that allows all local governments to borrow conditional upon designated banking criteria. One advantage of this approach is that these financial intermediaries can reduce the cost of borrowing for smaller local governments by spreading the risks across many governments, a practice that lowers the average costs of borrowing. Also, it may be possible to combine technical development assistance with lending assistance. A financial intermediary may also facilitate central government intervention through its supply of targeted investment funds. However, there are risks of a financial intermediation program. The program may be susceptible to political biases, abuses, and corruption. There has also often been a tendency for the central government to comingle a range of objectives with what should be strict lending criteria of a financial intermediary. See Box 4 for some international experiences with these types of funds.

Box 4: International Experience with Municipal Development Funds

In many western European countries, and now in many countries in Asia, Africa, and Latin America, there are specific institutions that have been established to allow subnational government borrowing for investment purposes. These institutions are sometimes called a municipal development fund (MDF); the management of a MDF is typically assigned to banks or government regulatory agencies, which are referred to as a municipal development intermediary (MDI). A municipal development fund is a pool of money operated at a level above individual subnational governments that is available to the subnational government for investment purposes. The main objective of these pools of funds is to mobilize resources from private lenders, the central government, and donor agencies, and to make these resources available for investment in urban infrastructure. Another objective is to provide assistance to subnational governments in the design, appraisal, and execution of investment programs. There are different approaches around the world in the management of these funds. There are also different sources of initial funding, including initial subscriptions from the central government, private lenders (including other financial institutions, insurance companies, and pension funds), and international donors. MDFs typically lend to local governments at preferential rates for long-term investments; in some cases, there are elements of grants to local governments (e.g., conditional matching grants or conditional block grants). Eligibility is often unrestricted, although limits on loan amounts are common, especially for larger subnational governments. Loans require subnational governments to meet various criteria, especially on debt service ratios. Indeed, assessing debt service capacity remains a difficult consideration in the management of MDFs.

Source: Davey (1988).

In either case, there needs to be appropriate central government oversight and regulation of municipal borrowing activities, in order to ensure that standard loan practices are met. The framework should, among other things: allow subnational governments to borrow and issue bonds only for capital investment purposes; specify the sources of borrowing (e.g., domestic financial institutions, special investment banks, and the like); require that the maturity of the loan match the project life; specify that subnational debt remains the responsibility of the subnational government (and not the central government); allow subnational governments to offer as guarantee for repayment the revenues generated from the project (a common practice in many developed countries); impose some limit on total indebtedness; require central government prior approval; and specify penalties for failure to meet debt obligations. It is especially important that the central government oversight should not extend to central government guarantor of municipal bond issues. Details of various regulatory schemes are discussed later.

However, municipal government borrowing has also often created problems of various types.⁵ First, the granting of preferential borrowing terms to local governments may create “moral hazard” problems in which local governments borrow more than is economically justified. Second and relatedly, local governments – and lenders – may believe that the central government will assume responsibility for any loans that the local governments are unable to repay, again creating a moral hazard problem that encourages lenders to make excessive loans to local governments and that also encourages local governments to borrow excessively. These actions impose largely unplanned and uncontrollable financial burdens on the central government that complicate overall macroeconomic stabilization policies. Indeed, there is much evidence that decentralization of local government borrowing has contributed to stabilization problems in countries like Brazil, China, and Colombia. See Box 5 for a discussion of the recent Argentina experience.

⁵ See Tanzi (1996) and Ahmad, Albino-War, and Singh (2005) for further discussion of the macroeconomic concerns stemming from decentralization.

Box 5: Subnational Borrowing in Argentina

Argentina is divided into 24 autonomous political jurisdictions consisting of 23 provinces and the City of Buenos Aires. With approximately 50 percent of total public spending occurring at the sub-national level, it is the most decentralized country in Latin America. At the same time, the most important taxes are collected at the national level, which implies a significant degree of vertical imbalance. However, within Argentina's federal structure all levels of government are generally permitted to borrow both domestically and abroad, and during the 1980s and 1990s both levels of government borrowed extensively, reflecting the weak fiscal management of the period. Given especially the lack of formal limitations on domestic currency borrowing operations, provincial governments have frequently pledged future coparticipation receipts as collateral for borrowing from commercial banks; in addition, they sometimes developed alternative sources of financing. These practices led eventually to the jurisdictions running unsustainable fiscal policies that often brought the provinces to the brink of bankruptcy. The exact time when the province entered into a serious fiscal crisis was in some episodes prompted by the occurrence of exogenous shocks in the economy, as was the case with the Tequila crisis in 1995. In this instance, the intervention of the federal government nationalizing the provincial pension systems and also in the case of Cordoba was mainly accelerated by the effect of the Tequila shock on those provinces' finances of those provinces. On other occasions, the provinces' fiscal distress was associated with an acute political crisis, which in turn motivated financial and political intervention by the federal government. In general, however, the federal government did not set up extensive and generous rescue operations. They were more a case-by-case-type solution. Using these mechanisms and negotiations, the federal government tried to obtain some benefits (such as provincial adjustment, reforms) in exchange for the financial help it extended. Even though the central authorities showed generosity toward some small and poor jurisdictions, federal support for other provinces, most notably large provinces such as Cordoba, was much less, and in the latter instances the province itself bore most of the cost of adjustment.

Source: Nicolini, Posadas, Sanguinetti, Sanguinetti, and Tommas (2002).

These types of difficulties have led analysts to suggest ways in which municipal government borrowing can be more efficiently organized and regulated. International experience with municipal government borrowing provides some specific suggestions on controls. See Ter-Minassian (1996) and Ter-Minassian and Craig (1997) for detailed discussions. The most important elements of any regulatory framework include: transparency via information and accounting systems, penalties for excessive borrowing, local government access to own-source revenues, and, especially, local government accountability via the political process.

Intergovernmental Transfers for Infrastructure Finance: Capital Grants.

Another potential source of initial investment finance (as well as ongoing operation and maintenance finance) is intergovernmental transfers. Transfers are typically justified on several grounds:

- To correct for vertical imbalances (e.g., between the national and the subnational governments)
- To correct for horizontal imbalances (e.g., between the subnational governments)
- To accommodate political differences and considerations
- To correct for externalities
- To achieve national objectives pursued at subnational levels.

All of these rationales can, in principle, be used to justify transfers that finance municipal infrastructure. Specifically, capital transfers can be used to assist in financing "lumpy" capital investments (e.g., vertical and horizontal imbalances), to offset significantly different infrastructure endowments (at least when these are not the result of voluntary local decisions (e.g., imbalances again), to address externalities across subnational governments, and to pursue national sectoral objectives at subnational levels.

Capital transfers are typically designed as project-based grants, which are closely administered and monitored by central government line ministries. These transfers are also typically allocated in the form of categorical or block grants, often on the basis of ad hoc decisions and negotiations between the central and the subnational governments. Sometimes there is a pre-established formula used to determine the amount of the transfer, such as the number of “clients” for a governmental service (e.g., students in construction of schools, patients in the construction of hospitals, cars in the construction of roads). There is also sometimes some type of competition process with defined application procedures, although this process may be subject to manipulation.

An important concern in capital transfers is how to achieve “additionality”, or maintenance of effort on the part of recipient governments. Transfers are almost always given as conditional grants, but funds are obviously fungible. Another concern is whether local governments will actually take “ownership” of the facility once it is constructed and maintain the infrastructure, given that the bulk of the funds used in construction usually come from the central government. See again Box 2.

Capital transfers – indeed, any intergovernmental transfer – carry with them significant institutional burdens and requirements. An overriding issue is the constraint on design and evaluation imposed by data availability. The allocation of most transfers is based on detailed formulae, all of which require detailed information that is often not available. Alm and Martinez-Vazquez (2009) discuss how transfers can be designed in a world with imperfect data. Even so, it is important to improve data collection. Relatedly, intergovernmental transfers require a strong central government ability to monitor the actual use of grants, as well as to monitor the performance of the grants; this also requires data upon which these evaluations are based. Many countries have chosen to use a special, independent “grants commission” to administer its transfer, in order to remove as much as possible the role of politics in grant design and allocation.

Overall, international experience suggests that there is no single best approach to design capital transfers. However, non-transparent, highly detailed and discretionary procedures should be avoided, and matching requirements in capital transfers can generate many benefits.

Further considerations in transfer design are discussed later.

Public-private Partnerships.

Public-private partnerships, also sometimes referred to as private participation in infrastructure (PPI), have been seen as a way to provide infrastructure without imposing an excessive fiscal burden on municipal governments. However, this potential has not frequently been realized. See Box 6.

Box 6: Public-Private Partnerships

The intense fiscal pressures in many developing countries have made the prospect of shifting investment responsibility to private infrastructure providers an attractive alternative to public sector provision, by offering the possibility of expanded and improved services without further burdening the government sector with additional fiscal demands. However, the general experience of these public-private partnerships has been disappointing, and they have played a far less significant role in financing infrastructure in cities than was hoped for. In particular, these partnerships have mobilized little private finance, for various practical, political, economic and institutional reasons. Indeed, these partnerships seem unlikely to eliminate, or even to reduce, the various constraints that these factors impose, in part because there are a number of features that raise the risk profile for of urban infrastructure for private investors, factors that are outside the control of many cities, factors that are unlikely to change.

Source: Annez (2006).

Privatization.

Indeed, one method of achieving greater private sector involvement is to privatize completely the service to the private sector. This option is often viewed as a means for lowering costs by encouraging competition. It is also viewed as a way to minimize the financial burden that service provision would impose on municipal governments, and as a way of improving service quality. However, the record of privatization is mixed. See Box 7.

Box 7: Privatization of Infrastructure: Some Lessons from Experience

Privatization is often viewed as a means for lowering costs by encouraging competition. The presumption is that public sector producers have poor incentives for efficient operation because they lack pressure to operate at the lowest cost. The private sector, on the other hand, is presumed to be subject to competitive forces. However, the public sector does not always have poor incentives and the private sector does not always face competitive pressures, so benefits do not always result from privatization.

Urban transit is an area in which private production can lower cost. Public bus systems often require large subsidies because of high operating costs. In the 1990s, the system in Karachi received a \$5 million annual subsidy, the system in Calcutta a \$10 million subsidy, and the system in Bangkok a \$30 million subsidy. On the other hand, the private sector Seoul system, which had 90 operating bus companies, received no subsidy. Private minibus systems have proven very effective in many cities. Some public bus systems, such as the one in Bombay, also operate without a subsidy. Some urban water supply activities in Chile, solid waste disposal and collection in Brazil, and intracity transportation in Nairobi are examples of effective private production of services.

Even if privatization appears beneficial, the public sector will typically be required to maintain a role in providing most infrastructure. One reason is that the private sector does not adequately provide for externalities, such as sewerage, dams, and roads, unless government financing is involved because of inability to charge user fees sufficient to finance the services. Also, some infrastructure services may be characterized by large economies of scale in production or distribution. The government may need to be involved in establishing a pricing scheme or subsidizing the service to move toward universal service. The government may also need to participate, at least in financing, if provision of infrastructure services is to be used as a way of redistributing income. Finally, the government may be required to regulate privatized firms, through regulation of service quality and of prices.

A key to obtaining the benefits of privatization is to encourage competitive market pressures. Neither government production nor close regulation may be necessary if the market is contestable. In many cases the private market may not exist in developing countries, and needs to be encouraged to evolve. Also, competition can be generated by allowing foreign firms to compete. Belize and Guatemala permitted foreign firms to compete for road maintenance because no significant domestic market existed. Government should seek to gain the benefits of competitive market for service delivery by identifying aspects of infrastructure delivery that are contestable and allowing the private sector to compete for these portions of service delivery, by allowing all private firms equal access to shared infrastructure facilities (e.g., telephone and railroad lines), and by permitting private sector alternatives that compete with infrastructure services.

Sources: Fox (1994) and Guthrie (2006).

Land- and Asset-based Sources of Finance.

Municipal governments often have access to various “assets”, especially urban land, which the governments believe can be used to help finance infrastructure. As classified by Peterson (2008), land-based financing may be classified in three main categories: developer exactions (including impact fees), value capture, and land asset management. Such methods have been used with some success in Cairo, Mumbai, Bangalore, Istanbul, Cape Town, and Bogota.

With developer exactions, developers are required to finance some or all of the infrastructure that new developments impose on local governments, such as roads, water and power delivery, and sewage treatment. In the United States, such developer exactions are often called impact fees, and are a commonly used method of infrastructure finance, especially in Florida, Colorado, and California. This method is consistent with the notion that *existing* residents of a municipality should not be required to pay for the costs of infrastructure required by *new* residents; that is, “development should pay its own way”, and the new residents are (in the absence of such charges) not paying the full social costs of their activities. The obvious remedy is to impose an additional charge on new residential and commercial/industrial construction that reflects these added social costs. If, when faced with the true social costs of their actions, individuals and businesses believe that their own benefits are greater than the costs of their actions, then such growth is economically desirable and should not be further limited or controlled; if individuals and businesses believe that the costs are greater than the benefits, then it is appropriate that such growth be discouraged. It is mainly this argument that underlies the increasingly popular use of impact (or development) fees in localities across the United States. Of course, an additional argument for impact fees is that they may generate the revenues necessary to provide the infrastructure. The main difficulty in the practical application of developer exactions is the actual calculation of the fee. In principle, the fee should measure the incremental costs of new construction, including infrastructure costs and also congestion costs. The calculation of the latter costs is particularly difficult. Although developers often oppose impact fees, experience indicates that developers in fact typically prefer impact fees to other methods of growth controls (e.g., zoning, regulations, outright growth limitations), primarily because they are far less complicated and much more certain.

Another method is land value capture. The provision of infrastructure is typically capitalized in land and housing values, and the notion here is that the local government should be able to appropriate some of this increase in value. Various methods have been used to capture the increases in value, especially betterment levies (which tax some percentage of the increase value via a one-time charge) and sale of land whose value has increased from the infrastructure. Betterment levies were used with some success in Colombia in the past, but difficulties in accurately assessing increases in values have proven difficult. China has more recently used land sales.

A final method is land asset management, where municipal governments exchange land assets for infrastructure assets. Cairo has used several variants of this approach to generate close to \$5 billion in revenues.

Peterson (2008) argues that all three methods should be part of an infrastructure strategy of municipal governments: municipalities should first conduct a thorough inventory of land and other assets, they should then use developer exactions for partial finance of infrastructure, and they should finally use value capture to generate additional revenues to fill in specific gaps.

5.2. Ongoing Operation and Maintenance Expenses

User Fees as the “Ideal” Source.

User fees are widely seen as the most appropriate source of revenues for operation and maintenance expenses. If set at marginal cost of service provision, user fees can generate the revenues necessary to pay for ongoing variable costs of service provision. In addition, if set at appropriate levels, user fees can serve the same basic function as market prices for market commodities, as an indicator of consumer willingness to pay for services. More generally, it is typically recommended that local governments should

rely predominately upon user charges to finance goods that provide measurable benefits to identifiable individuals within a single jurisdiction.

However, the actual extent of cost recovery via user fees is almost everywhere quite poor. Various reasons have been suggested for this failure. See Box 8 for examples from Africa.

Box 8: Cost Recovery from User Fees: The African Experience

Although data are often poor or even non-existent, the limited evidence that is available indicates that African countries typically do not charge for public services – for water supply, sewerage, electricity, telecommunications, markets, housing, public transport, and land development – to the extent that is consistent with enhancing economic efficiency and providing adequate revenues for service delivery. Prices are often charged for services, in areas and sectors as diverse as: public toilets in Accra, Ghana; water delivery in Lagos, Nigeria, Mombasa and Nairobi, Kenya; public utilities in Francistown, Botswana; and sanitation in Kitwe and Lusaka, Zambia. However, with some exceptions, these prices are invariably subsidized at levels well below marginal cost. Problems include inadequate billing and collection procedures, insufficient attention to operations and maintenance, and political constraints.

Source: Fox and Edmiston (2000).

Municipal Tax Revenues.

Municipal governments can also finance infrastructure-related expenses from tax revenues. Although there is much diversity in the fiscal structures of national and subnational governments, several general “best practices” have emerged that provide a useful point of departure (Musgrave, 1983; McLure, 1994, 2006; Bird, 1999; Bahl and Bird, 2008):

- The Subsidiarity Principle should be applied to taxes as well as to expenditures: taxes should be assigned to the lowest level of government that can administer the tax efficiently, and for similar reasons.
- Local governments should rely predominately taxes, and taxes on immobile tax bases, to finance local services for which it is difficult to identify individual beneficiaries and to measure individual costs and benefits.
- Local governments should rely predominately upon user charges to finance goods that provide measurable benefits to identifiable individuals within the jurisdiction.
- Local governments should avoid taxes on mobile tax bases, especially capital, and should also avoid imposing progressive income taxes. Local government attempts to redistribute income by progressive income taxes will lead to the out-migration of more mobile, higher income individuals, thereby leaving more immobile, lower income individuals to bear the burden of the taxes. As with progressive income taxes, the potential mobility of capital or other mobile factors of production will lead to out-migration if these factors are taxed at higher-than-average tax rates. By the same token, attempts to induce in-migration of mobile factors can lead to the so-called “race to the bottom”, as local governments compete with each to attract and to hold these factors by extending tax breaks and other fiscal incentives.
- Local governments should be assigned adequate sources of revenues consistent with their expenditure responsibilities. Local governments should have discretion over the rate of some taxes to promote accountability of local officials and to establish a link between services demanded and the cost of service provision. Locally assigned taxes should exhibit adequate revenue elasticity so that collections can grow with the demand of services over time. The assignment of taxes should also meet the test of administrative feasibility.
- Intergovernmental transfers should be used to finance those services that generate spillovers to nearby jurisdictions, since strictly local finance will lead to inefficient provision. The central government should impose taxes on those tax bases that are distributed unequally across

jurisdictions, and use the revenues from these taxes to equalize fiscal capacities across these areas.

(Recall that borrowing should be used to finance long-lived capital investments on infrastructure.) In short, a “good” municipal tax system should not unduly distort individual and firm decisions, should generate sufficient revenues to allow the government to finance at the margin their expenditures, and should burden only local residents.⁶

The broad pattern of municipal finance in cities around the world is consistent with some, but seldom all, of these principles. Indeed, there is much diversity in the fiscal structures of municipal governments. Despite enormous efforts made over the years on tax assignment issues, Bahl and Bird (2008) argue that there is still no general consensus about what works and what does not.

Around the world there are essentially two basic models of revenue assignment that attempt to satisfy these principles. In what might be called the Western or Anglo-Saxon model of “fiscally strong local governments” (e.g., the United States, Canada, Australia), local governments independently legislate and administer their own taxes, an approach that obviously gives local governments significant fiscal autonomy and adequacy. However, this model is probably not appropriate for many countries. Instead, in many other countries the model is one of “fiscally weak local governments” that do not generate much revenue from their own sources, that do not independently legislate and administer their own taxes, but that are often allowed to add a local tax onto the back of some existing central government tax. This approach is often and increasingly used as part of decentralization reforms around the world (Bahl and Linn, 1992).

It is useful to discuss in more detail the major types of taxes that are used by many local governments, since this discussion relates directly to the often limited ability of municipal governments to generate funds for infrastructure.

Although there is much diversity in country experiences, the property tax is a common and important tax for municipal governments, especially those in the Western or Anglo-Saxon tradition. The property tax is in many ways an attractive revenue source. If measured properly, its base should increase with urban growth. Because property can be assessed by physical inspection, the tax is difficult to evade. There is much evidence that the tax has at least a proportional and often a progressive effect upon the distribution of income. The tax is unlikely to create serious distortions in land markets, and may in some circumstances actually improve the efficiency of resource use. Finally, it is sometimes argued that the property tax is most appropriately administered at the local government level because officials there have a better motivation to collect the tax and because the tax can be viewed in part as payment for local services (especially if property values are tied to the levels of some of those services).

However, there are also major difficulties with the property tax. The revenue potential of the property tax is seldom realized, due largely to significant administrative problems in identifying properties, valuing them, adjusting valuation over time, collecting revenues, and enforcing penalties. Also, the tax base is typically distributed across local governments in very uneven ways, thereby contributing to extreme horizontal fiscal disparities across jurisdictions. Perhaps as a result, despite compelling evidence to the contrary, the property tax is actually seen by individuals as a regressive tax, one in which greater burdens are imposed on lower- than on higher-income households. All of these issues are well-known, but this recognition has done little to improve the administration of the tax, even in wealthy countries. Indeed, the property tax is often rated by individuals in polls as among the least popular of all taxes.

Many local governments impose taxes on automobile ownership and use, such as an annual license tax, a registration fee, a transfer tax, a parking fee, tolls, and, at times, a fuel tax (although most countries reserve fuel taxes for central government use). Because car ownership is concentrated in upper income

⁶ A “good” local tax should therefore have several main characteristics: the tax base should be immobile; the tax should generate adequate, predictable, and growing revenues; the tax should be visible to and borne by local residents; the tax should be perceived to be “fair”; and the tax should be easy to administer by the local government.

classes, automotive taxes are likely to increase the progressivity of local government finances. Revenues are likely to grow steadily with urban growth. The taxes can be administered at relatively low cost. They can be used for general financing, but they can also be earmarked to finance road construction and maintenance and to decrease congestion and pollution in urban areas. However, with a few exceptions, these taxes are a significantly underused source of revenue.

There are several indirect taxes that are potential revenue sources for local governments. Local governments often impose a range of specific excise taxes, sometimes called sumptuary taxes, on commodities like beer, liquor, and tobacco. These taxes generate substantial revenues, they are easy to collect, and they may well discourage consumption of harmful or “immoral” commodities (or “sin taxes”). However, such taxes are also unlikely to grow much over time, they may be regressive, and their use is clouded by the possibility of individuals buying commodities (or smuggling them) from outside the boundaries of the taxing jurisdiction. Furthermore, collection of excise taxes tends to be concentrated at borders or factory locations, so that they are often unevenly distributed across local governments. It is possible that local governments could obtain some revenues from, say, a central government sales tax, by adding a surtax onto the central government rate, by sharing a specified percentage of the national government collections, or by having a separate retail sales taxes.

Finally, it is not uncommon for local governments to impose a surtax, or an additional local government tax, on a national government income tax, along the same lines as a local surtax on a national government sales tax. The use of such a “piggyback income tax” is a common practice in Scandinavian and central European countries. There are a number of reasons for caution in the use of a local government piggyback income tax, most of which are the same disadvantages as for direct local income taxes. For example, a local government income surtax could generate distortions in resource use, as individuals move to avoid paying the tax and as cities “compete” with one another by changing the tax rate. Still, there are some clear advantages to local surtaxes. The central government administers the tax, thereby avoiding unnecessary duplication of administrative efforts. The central government also retains the authority to define the tax base, which reduces locational distortions from mobile factors and which also reduces interferences of local governments in national stabilization policies, even if these coordination problems are not eliminated. Importantly, local governments are given some discretion in choosing tax rates, within some lower and upper bounds, and this choice enhances their ability to make effective fiscal decisions. Indeed, surcharges of various types have been increasingly recommended as part of decentralization efforts around the world, especially in transition countries where it is necessary to find some fast and sustainable way to give cities a significant fiscal capacity.

Of course, tax systems are designed to achieve multiple objectives. An obvious purpose is to raise the revenues necessary to finance government expenditures (sometimes termed “adequacy”), and also to ensure that the growth in revenues is adequate to meet expenditure requirements (“elasticity”). Another is to distribute the burden of taxation in a way that meets with a society’s notions of fairness and equity. Equity is typically defined in terms of “ability to pay,” such that those with equal ability should pay equal taxes (“horizontal equity”) and those with greater ability should pay greater taxes (“vertical equity”). Taxes can also be used to influence behavior of those who pay them; in choosing taxes, a common goal is to minimize the interference of taxes in the economic decisions of individuals and firms. Taxes should be simple, both to administer and to comply with, because a complicated tax system wastes the resources of tax administrators and taxpayers. The appropriate design of taxes requires balancing tradeoffs among these various goals. Also, some of these various goals of taxation can also be achieved by tax sharing among governments, although tax sharing does not typically give local governments any real authority in the selection of local tax rates and therefore does not promote accountability and efficiency in local expenditures.

Even so, tax assignment does not always follow these principles. Common problems include:

- Vertical imbalance (e.g., an inadequate correspondence between expenditure responsibilities of municipal governments and their assigned sources of revenues)
- Lack of meaningful tax autonomy, as reflected in excessive reliance on shared taxes and intergovernmental transfers
- Unstable and/or confused tax assignments

- Assignments with inefficient incentives
- Horizontal imbalance (e.g., an inequitable or uneven apportionment of tax revenues among subnational jurisdictions).

It is also the case that subnational revenue mobilization remains extremely variable around the world, and is often quite low. See Table 1.

Table 1. Measures of Fiscal Decentralization

	1970s		1980s		1990s-2000s		
	Developing Countries	OECD Countries	Developing Countries	OECD Countries	Developing Countries	OECD Countries	Transition Countries
Subnational Taxes as Share of Total Government Taxes	10.7 (43)	17.9 (24)	8.9 (33)	18.2 (23)	10.6 (28)	18.4 (21)	22.4 (23)
Subnational Expenditures as Share of Total Government Expenditures	13.4 (45)	33.7 (23)	12.1 (41)	32.0 (24)	13.0 (54)	32.7 (24)	30.3 (24)

Numbers in parentheses are sample sizes.

Source: *Government Finance Statistics*, various issues.

Intergovernmental Transfers Once Again.

There are various ways by which transfers can be classified. One method focuses on the specific *type* of grant: unconditional versus conditional transfers (e.g., a transfer that can be spent on any service versus a transfer that must be spent on a specific and designated category); non-matching versus matching transfers, where “matching” refers to a specific percentage of recipient expenditures that is subsidized by the donor government; and close-ended versus open-ended transfers (e.g. a grant whose amount is limited versus a grant that is not limited). Another method focuses more on the details of grant system *design*, and considers several dimensions of this design, typically the methods by which total divisible pool of funds is determined and also the methods by which the pool is allocated among eligible units.

As noted earlier, international experience suggests that there is no single best approach to design capital transfers. However, transfers that are simple, transparent, and stable seem better able to achieve transfer objectives than transfers that are non-transparent, highly detailed, and discretionary. It is also important to recognize that one grant/transfer instrument cannot accomplish multiple objectives. See Box 9 for an example of the problems generated when a single transfer attempts to achieve too many objectives, the Provincial Equitable Share in South Africa.

Box 9: Intergovernmental Transfers in South Africa – the Provincial Equitable Share

The Provincial Equitable Share (PES) transfer is a formula-driven grant program that distributes unconditional transfers to provinces in South Africa. The formula consists of six components that capture the relative demand for services between provinces and that take into account specific provincial circumstances:

- An education share (51 per cent) based on the size of the school-age population (ages 5-17) and the number of learners (Grade R to 12) enrolled in public schools
- A health share (26 per cent) based on the proportion of the population with and without access to medical aid
- A basic share (14 per cent) derived from each province's share of the national population
- An institutional component (5 per cent) divided equally between the provinces
- A poverty component (3 per cent) that reinforces the redistributive element
- An economic output component (1 per cent) based on GDP by region.

A standard principle of policy design is to use one separate instrument for each different objective, and a common problem in many countries with the design of transfers like equalization grants is that they get overloaded with many policy objectives; at the end it is not clear what is pursued or achieved with the transfer system. The PES illustrates this problem: it attempts to achieve too many objectives, and it does not achieve any one clearly. An important question therefore is: What is the primary goal of the PES in South Africa? The PES can be defined as a constitutional entitlement on central government revenues for each sphere of government. In this view the PES formula should be concerned with how the shares can be allocated equitably. However, an equitable distribution formula is not necessarily equivalent to an equalization formula in the traditional sense of addressing fiscal gaps or horizontal disparities between sub-national government units. For example, the notion of equity may require the distribution of funds for reasons other than achieving greater equality, such as providing more funds to those provincial governments that are more entitled for some reason (e.g., the presence of natural resources in their territories). It is clear that currently there are too many objectives other than equity/equalization being pursued with the PES transfer. For example, the "economic activity" component of the formula is nothing more than some form of revenue sharing on a derivation basis. Revenue sharing is a form of transfer used in many countries as a solution to closing vertical imbalances (since central governments collect much more than the expenditure responsibilities demand), and it may also be a way to let richer sub-national governments get their share in the wealth/revenues collected in their territories. As such, South Africa can also make use of revenue sharing, but this "economic activity" component does not really belong in a traditional equalization transfer. Indeed, in most countries revenue sharing is arranged separately from other transfers, including equalization transfers. Thus, the most fundamental question that needs to be answered is what exactly is the purpose of the PES. Is it to equalize, distribute, or redistribute public funds to the provinces? Is it instead a general funding mechanism to enable the provinces to deliver constitutionally mandated services? Or is it other things? These questions remain unanswered.

Source: Alm and Martinez-Vazquez (2009).

6. The Role of Institutions

As noted earlier, the conditions under which decentralization “works” include a range of factors, many of which relate to the institutional structures of the relevant country, including the governance structures of urban areas and the administrative capacities of municipal governments. This section examines the potential impacts of governance institutions.

6.1. What Do Urban Governments Do?

The Subsidiarity Principle suggests a list of fairly specific functions for urban governments. These include responsibilities for:

- Roads and bridges
- Public transit
- Street lighting
- Sidewalks
- Water system
- Sewer system
- Garbage collection and disposal
- Police protection
- Fire suppression and prevention
- Land use planning
- Economic development
- Parks and recreation
- Libraries

Some other functions often performed (at least in part) by municipal governments include welfare assistance, child care services, housing, and public health, although these types of functions have strong elements of income distribution, a function usually assigned to the central government.

6.2. Some Types of Municipal Governance Structures Around the World

As argued by Bird and Slack (2007), local governance is critical in the physical and social character of city-regions. The quality and nature of these institutions affect both the quantity and the quality of local public services and the efficiency with which they are delivered.

Recall that the Subsidiarity Principle argues that the efficient provision of services requires decision making to be carried out by the lowest level of government that can do so efficiently because a government “closer to the people” will be better able to adjust services to the demands of its citizens. There is also the implication that smaller governments will stimulate competition between local jurisdictions, which will in turn induce them to offer the best possible mix of taxes and services to individuals who will “vote with their feet” by moving between jurisdictions (Tiebout, 1956). Factors that argue for a larger consolidated government structure are economies of scale in service provision and the existence of interjurisdictional externalities, both of which suggest that a larger government jurisdiction may be needed to consider appropriately the full extent of benefits and costs of public services. A larger government jurisdiction may also be necessary to collect more efficiently tax revenues. The relevant choice of an appropriate governance structure is therefore unclear, and depends largely upon how one weighs these conflicting considerations. Indeed, it is striking that no “one size fits all” strategy emerges when these tradeoffs are fully considered. As is often the case with institutional design, the broad questions that are relevant seem universal, but the answers are invariably dependent on specific context.

Bird and Slack (2007) identify several main types of municipal governance; see also Slack (2007) and Slack and Chattopadhyay (2009). These include what they term a one-tier model of municipal

governance, a two-tier model, a voluntary cooperation model, and special-purpose districts. Consider each type.

Under the one-tier model a single local government is responsible for providing the full range of local services. The one-tier model can take two distinct forms: a series of small *fragmented municipalities* in a metropolitan area, or *one large consolidated municipality* for the whole area. Fragmented one-tier governments are common in the United States. The two-tier model consists of an upper tier governing body (usually a region, district, or metropolitan area) that encompasses a large geographic area and that is responsible for services that have wide-scale benefits, that generate externalities, or that demonstrate economies of scale; lower tier units cover smaller areas and are responsible for services that provide local benefits. The voluntary cooperation model is closer to a de minimis government structure, in which there is an area-wide body based on voluntary cooperation between existing units of local government with no permanent, independent institutional status. These structures are politically easy to create – and to disband – but their effectiveness is limited due to the purely voluntary nature of the arrangements. A last form of organization is special-purpose districts, which are typically used to deliver services that extend beyond municipal boundaries.

In sum, neither theory nor practice tells us clearly which model of governance is “best” for large metropolitan areas. Nonetheless, one main conclusion is that a strong regional structure encompassing the entire city-region is important. Metropolitan areas have strong interdependencies (institutional and economic), and some form of regional governance is needed to address such problems of a regional nature. Few problems stop at municipal boundaries, and most solutions require coordinating the decisions of larger geographical units than characterize a “typical” local government.

However, what kind of regional structure is called for here? Bird and Slack (2007) conclude that different models have worked successfully in different places. Indeed, it follows that a second main conclusion is that what is more important than the precise form of governance is simply that some form of governance – and some form of effective governance – be in place. Bird and Slack (2007) also suggest that the real choice usually comes down to one-tier versus two-tier structures. Because a one-tier structure is simpler to understand and more transparent than a two-tier structure, a one-tier structure may improve accountability; a one-tier structure may also encourage greater local government experimentation, and it may give individuals more choices in where they choose to live. Two-tier structures may be better able to achieve efficiencies (e.g., economies of scale, externalities), but their greater complexity may result in confusion among citizens about responsibilities and burdens and so in less accountability.

7. Some Evidence: Selected Information on Municipal Capital Investments

Data on the extent of subnational borrowing is notoriously variable, non-standardized, and unreliable. In many cases, the data that are available are collected by local experts, so that there is a strong idiosyncratic element that is present. Even so, Table 2 gives some selected information on the relative reliance of local governments on borrowing as a source of own-source revenues, mainly for selected years in the 1990s, as compiled by Alm and Indrawati (2004). The extent of local government borrowing seems quite variable but generally seems quite low.

Table 2. Local Government Reliance upon Borrowing in Selected Countries

	Share of Borrowing in Local Government Revenues (percent)
Industrial Countries	
Austria	8
Belgium	0
Cyprus	12
Denmark	0
Finland	6

France	9
Germany	9
Greece	4
Iceland	0
Ireland	5
Italy	7
Luxembourg	9
Netherlands	0
Norway	0
Portugal	7
Spain	13
Sweden	0
Switzerland	4
Turkey	0
United Kingdom	8
Developing Countries	
Ghana	0
Malta	0
San Marino	69
Senegal	2
Swaziland	4
Uganda	0
Zambia	0
Zimbabwe	3
Transition Economies	
Albania	0
Bulgaria	3
Czech Republic	10
Estonia	3
Hungary	7
Latvia	0
Lithuania	0
Macedonia	0
Poland	0
Romania	0
Russian Federation	0
Slovakia	4
Slovenia	0

Source: Alm and Indrawati (2004).

8. Case Studies: Examples of Successful/Unsuccessful Municipal Finance

In this section I examine several specific case studies of urban infrastructure finance, using examples from Indonesia, the United States, Korea, Bangladesh, Bolivia, and China, all found in the existing literature. The case studies examine different aspects of municipal borrowing, municipal taxing, intergovernmental transfers, user charges (congestion fees), land-assets, privatization, and governance. These case studies illustrate different results, but there are several common themes throughout, regardless of whether the specific examples can be classified as a “success” or as a “failure”. The specific conclusions from these studies are the following:

- Establishing the conditions under which subnational borrowing can take place is a difficult undertaking.
- The ability of municipal governments to generate significant amounts of own-source tax revenues, especially from the property tax, is often quite limited.

- User charges (including congestion fees) can be a useful source of revenues and can also have positive impacts on resource allocation, but their record is mixed.
- Block transfers do not always achieve their intended results.
- Privatization must pay attention to its distributional effects.
- Land-acquisition by local governments can be abused by the governments, which can generate enormous hostility among land owners who feel exploited by the process of acquisition.
- Urban governance has significant impacts on the expenditures of the relevant governments.

The more general and suggestive themes include:

- There are multiple dimensions by which a project can be evaluated, and success/failure is often different across these dimensions.
- The data necessary to conduct a thorough ex post evaluation of a project are often poor, even non-existent.
- Indeed, it is often the case that a thorough ex ante benefit-cost analysis of a project is not done adequately; data problems are often the overriding issue.
- The reasons for success/failure are often unclear.
- In particular, the role of institutions in determining success/failure is not well understood and often neglected.

8.1. Subnational Borrowing in Indonesia

Following independence from the Dutch after World War II, Indonesia had been established as a multi-tier state, with provinces below the central government in Jakarta and local governments as the third tier. Even so, most authority was concentrated in the central government, justified largely as a way of maintaining national unity and cohesion in a nation with over 200 million people spread across 14,000 islands. However, in May 1999, the Government of Indonesia (GOI) passed two laws that transformed intergovernmental relations: Law No. 22/1999 on Regional Government (UU PD) and Law No. 25/1999 on the Fiscal Balance between the Central Government and the Regions (UU PKPD). Part of these reforms related to borrowing by subnational governments.

Before the passage of these laws, local government borrowing had been controlled very tightly by the central government under Law No. 4/1974. Under this law, regional governments were permitted to borrow, but only with the approval of central government and only under some limited circumstances. The extent of borrowing was quite limited, or well less than 0.5 percent of GDP; of this, most borrowing had been undertaken by the regional water authorities (or PDAMs). Despite the favorable terms, the repayment of loans had been poor, and the arrears rate was high (Lewis, 2003).

With the passage of Law No. 25/1999, the GOI changed to a new approach toward borrowing. In principle, the law gave local governments substantial freedom to borrow from domestic sources and also from foreign sources (via the central government). More specifically, long-term borrowing (e.g., more than one year) is only allowed for investment spending to build infrastructure that can generate revenue for repayment. Even some short-term borrowing is permitted but only for the management of local government cash flow.

However, these new borrowing powers raised many concerns about how local governments would actually respond, given especially ongoing worries about the largely unchanged capacity of local governments to manage their budgets (including their borrowing). Accordingly, the central government faced pressure to restrain local government borrowing.

Consequently, in practice, the central government has over the last decade maintained very strict limitations on local government borrowing, of various types. For example, a government regulation on local borrowing (No. 107/2000) requires that: maximum accumulated debts must be less than 75 percent of general revenues from the previous budget; the debt service coverage ratio must be at least 2.5; maximum short-term borrowing cannot exceed 1/6 of current spending; borrowing must be approved by either the central government via the Ministry of Finance or by the local parliament (depending on the

source of borrowing); and commercial/private foreign borrowings are not allowed. Even after imposing these regulations, the central government still felt the necessity – supported strongly and explicitly by multilateral institutions such as the International Monetary Fund and the World Bank – twice to delay the implementation of the local government borrowing regulations.

A relevant issue here is the actual borrowing capacity of local governments in Indonesia. Alm and Indrawati (2004) used estimates from the University of Indonesia on revenue and expenditures of local governments to measure potential local government borrowing capacity for the year 2001.^{7 8} According to their estimates, as presented in Table 3, most local governments in Indonesia have wide room to initiate new borrowing. More than 80 percent of provincial governments, almost 95 percent of district/kabupaten governments, and roughly 50 percent of city governments have the ability to borrow above Rp 10 billion.

Table 3. Local Government Borrowing Capacity in Indonesia

Ability to Repay (in Rp)	Provincial Government		Kabupaten Government		City Government	
	Number	Percent	Number	Percent	Number	Percent
More than 100 billion	5	19.2	22	9.5	2	3.3
10 – 100 billion	14	53.9	171	73.7	17	28.3
Less than 10 billion	2	7.7	27	11.6	11	18.3
Not allowed to borrow	5	19.2	12	5.1	30	50.0
Total	26	100	232	100	60	100

Source: Alm and Indrawati (2004).

Despite the apparent capacity of many local governments to borrow, central government controls have remained quite severe, due to the presence of enormous public debt, recurrent macroeconomic shocks (e.g., the tsunami of 2004, earthquakes), and ongoing concerns about the capacity of local governments to manage their budgets. On balance, Alm and Indrawati (2004) concluded that the GOI policies seem designed mainly to deal with macroeconomic considerations of the central government, and not to create a system to allow local governments to gain access to credit markets. These central government restrictions remain largely in place, even today.

In order to reduce the negative impacts of these government controls, Alm and Indrawati (2004) argued that the central government must design a transition strategy to adjust from the current reliance on direct administrative control of local borrowing to a greater reliance on market discipline policy, including such actions as: improving and implementing a government accounting system for fiscal management; imposing requirements of local borrowing that replicate market discipline; diversifying the sources of any local borrowing fund; using less reliance upon the central government budget and foreign government borrowing and greater reliance on private market sources; and creating regulatory bodies to support,

⁷ Note that local government revenues mainly come three sources: fiscal transfers from the central government (e.g., general block grants, specific grants); revenue sharing from natural resources (oil, gas, forestry, mining, fishery), the property tax, and user fees; and local own-source revenues.

⁸ Projections of the revenue side were based upon the following assumptions and procedures:

- Local-own revenues were estimated using their annual performance in 1999/2000.
- Revenue sharing from natural resources was based on Ministry of Finance calculations, which project distributions to local governments in 2001.
- Revenue sharing of property taxes and acquisition fee was estimated using LPEM-FEUI simulations.
- The general grant allocation was estimated using the LPEM-FEUI model, which will be used as a grant allocation formula in the government regulation.
- Provincial governments were assumed to receive revenue sharing from the income tax (20 percent), which is not shared with district and city governments.

Projections on the expenditure side used the following assumptions:

- Routine expenditure was estimated using the figure for 1999/2000.
- Investment spending was calculated using the DIK/List of investment activities that was submitted by local governments to the central government for the fiscal year 1999/2000.

facilitate, supervise, and safeguard the work of a local borrowing market. They argued also that the long run goal must remain the creation of a viable market-oriented framework in which local governments face hard budget constraints but still have access to credit markets.⁹

8.2. User Charges for Tunnels in Seoul

Traffic congestion in Seoul increased dramatically in the 1980s despite new construction of urban freeways and subway lines. In 1996 the Seoul metropolitan government began charging 2000 won (or slightly more than \$2) for access through two tunnels (Namsan #1 and Namsan #3) that provided private vehicle links from downtown Seoul to the southern part of the city. Charges were set for one- and two-occupant private vehicles, and were collected in both directions on the basis of each entry with the times of 7am to 9pm during weekdays and from 7am to 3pm on Saturdays. Private cars with three or more passengers, along with taxis, buses, vans, and trucks were exempt from the charges. All traffic on Sundays and on national holidays was also exempt.

As reported by Hwang, Son, and Eom (1999), in the two years following the enactment of the charges, there was a 34 percent reduction in peak-period passenger vehicle volumes. Also, the average travel speed increased by 50 percent, and the number of toll-exempt vehicles increased substantially in both corridors. Traffic on alternative routes increased by up to 15 percent, but the average speeds also increased due to improved traffic flows, especially at intersections with signals that were linked to the Namsan corridors. Annual revenue from the two tunnels was \$15 million, and was earmarked for transportation projects, including transport systems management and transport demand-management measures in the rest of Seoul.

Singapore has also had some success with such congestion pricing, especially with its use of an electronic pricing system. However, other countries have had more limited success, including Kuala Lumpur and Bangkok (Gwilliam, 2002)

8.3. Property Tax Mobilization in Bangladesh Municipalities

Since at least the 1980s, the Government of Bangladesh (GOB) has consistently stated that it wishes to pursue fiscal decentralization. True decentralization requires (among other things) that a local government have some control of its own (fiscal) fate, and this can be achieved only if the local government can itself change on the margin the revenues it collects and so the services it provides.

Alm (1997) examined the revenue capabilities and performance of municipal governments (“pourashavas”) in Bangladesh. He found that generally accepted principles of tax assignment for municipalities were largely followed in Bangladesh. The principle own-revenue source for pourashavas was the holdings tax, a simplified form of a property tax, they also generated revenues from other property-related bases, such as leasing activities and a tax on the transfer of “immovable property. However, pourashava autonomy or discretion in the use of these revenue sources, especially in the establishment of rates, was extremely limited. Also, the ability of many of these existing tax sources to generate adequate and significant amounts of additional revenues in the near-term was extremely limited; in particular, it was difficult to increase -- in a fast, significant, and sustainable way -- the yield of the holdings tax.

Second, the available evidence, collected by a specially commissioned survey of pourashavas, indicated clearly that pourashavas generated extraordinarily small amounts of revenues from these sources. The level of collections from these own-revenue sources was extremely and dismally low, varied enormously across pourashavas, and had grown erratically across pourashavas and over time. Collections of total own revenues rarely exceeded Tk 100 per capita (relative to per capita gross domestic product at the

⁹ For a detailed discussion of how to create local credit systems, see especially Peterson (2000) and Noel (2000).

time of about Tk 9000), except in larger cities and in city corporations, and in some smaller pourashavas collections were even lower. The variations in collections of total own revenues per capita across pourashavas were extremely great, and there were also extremely large differences by pourashavas in their growth rates of collections over time. Many revenue sources were barely used at all. In large part because of low collections from own sources, pourashavas were heavily dependent on central government transfers for much of their revenues.

Third, various explanations were given for the poor pourashava revenue performance, including the political fears of raising taxes and the poverty of city residents. More convincing reasons were the limited administrative capabilities of the pourashava personnel (especially for the holdings tax), the extreme undervaluation of the property tax base, the failure to impose penalties (especially on arrears), and the presence of corruption in pourashava administration. Indeed, Alm (1997) concluded that many of the taxes assigned to pourashavas did not have any real revenue potential (a "vertical" imbalance"), and were more in the form of nuisance taxes.

In short, Alm (1997) concluded that the ability of municipal governments to generate adequate revenues from the property tax – indeed from any tax currently assigned to pourashavas – was quite limited, even with improved tax administration. He suggested that any increase in revenue capabilities required that pourashavas make greater use of the income potential from their own properties, including income from leasing and rentals. More importantly, he argued that the limited ability of existing pourashava revenue sources required that pourashava use of new tax sources should be considered, especially a surcharge to the GOB individual income tax (e.g., a pourashava "piggyback" tax to the existing GOB income tax). He estimated that a 10 percent or a 25 percent local surcharge (on the income tax liability), for those pourashavas for which information on income tax collections was available from the National Board of Revenue, could give an immense increase in revenues. For several pourashavas, a 25 percent surcharge would generate collections in excess of total own revenues from all current sources. However, to date such piggyback taxes have not been enacted in Bangladesh.

8.4. Grant Finance of Infrastructure: Lessons from the United States

A significant amount of infrastructure finance in many municipalities comes from conditional block grants from the central government. It is useful to examine the experiences of other countries with such grants, in particular that of the United States.

In 1966, the Partnership for Health Act combined nine categorical health grants into one block grant for health. Robbins (1976) and Stenberg and Walker (1977) analyzed the results of this consolidation, and concluded that the block grant increased the administrative flexibility of state health officials, even though state health planning agencies generally did not have a major influence on the block grant and state health planning agencies located in governors' offices had less influence over the block grant than those located in state health departments. Most significantly, the new block grant did not generally result in a reordering of spending priorities, including any changes of infrastructure spending (e.g., hospital and other health facility construction). Robbins (1976) and Stenberg and Walker (1977) argued that the best explanation for the unspectacular effect of combining several categorical grants into one block grant was that, without an increase in the amount of the overall amount of the transfer, the new administrative flexibility given state officials was insufficient to produce a substantive reordering of program priorities.

More recently, Finegold, Wherry, and Schardin (2004) examined the entire United States history of block grants, beginning with the Partnership for Health Act in 1966 and extending to: the Safe Streets program, created under the Omnibus Crime Control and Safe Streets Act of 1968; the Community Development Block Grant, the Social Services Block Grant, and the Comprehensive Employment and Training Act Block Grant of the 1970s; the consolidation of 77 categorical grants into 9 block grants as part of the Omnibus Budget Reconciliation Act of 1981; and the Personal Responsibility and Work Opportunity Reconciliation Act, the welfare reform legislation that replaced the Aid to Families with Dependent Children and related programs with the Temporary Aid to Needy Families (TANF) block grant. They

concluded that funding gradually declined over time for nearly all of the block grants. They also found that Congress typically eroded over time the flexibility of the block grants by adding restrictions, requiring that a share of funds be set aside for particular purposes or creating new categorical programs with the same or related objectives. These restrictions were justified by Congress as an attempt to deal with misuse or maladministration of the block grants by state and local governments, but were more likely enacted because of political benefits from more narrowly targeting the grants to specific constituents. Not surprisingly, Finegold, Wherry, and Schardin (2004) concluded that block grants work best when state and local government administrative capacities are strong and already exist. For example, following implementation of the Reagan block grants, state officials reported management improvements, including better planning and budgeting methods, changes in administrative procedures and standardization across programs, and increased efficiency in the use of state personnel (Peterson et al. 1986; GAO 1985). Even so, the GAO (1982) found only a small reduction in overall administrative costs under the pre-1981 block grant programs, with administrative costs increasing in some cases, and few state administrators claimed savings of more than 5 percent under the Reagan block grants (Peterson and Nightingale 1995). Indeed, implementation of new block grants has tended to be smoothest when states were already responsible for administering the categorical programs they replaced. Finally, Finegold, Wherry, and Schardin (2004) reported mixed evidence from other studies that state governments used the increased flexibility of block grants to redirect spending away from individuals or communities with the greatest need. The GAO (1982) study of pre-1981 block grants found the receipt of resources by target populations about the same under categorical and block grant programs, and Peterson et al. (1986) also found no indications that states had used their flexibility under the Reagan block grants to directly shift resources from poor or low-income families. However, Bennett and Perez (1986) found that state allocations to local districts under the education block grant were based more on enrollment, and less on need, than under the categorical programs it replaced. In this regard, there was little evidence from any study that the block grants achieved (where relevant and intended) any change in infrastructure spending, a result similar to that of Robbins (1976) and Stenberg and Walker (1977).

8.5. Water Privatization – and Renationalization – in Bolivia

The water sector in the Bolivian cities of La Paz and El Alto was privatized between 1997 and 2005. When the original concession contracts were formulated, the municipal governments and the private company agreed upon explicit coverage targets. The agreement required that the company install 71,752 new water connections by 2001, a coverage rate that provided essentially universal coverage in La Paz and 82 percent coverage in El Alto. These coverage rates were largely achieved. However, the private contracts were terminated in 2005, and the sector was renationalized.

Hailu, Osorio, and Tsukada (2009) examined the performance of the private company during the 1997-2005 period, and also explored the reasons for the renationalization. Using data from national household surveys conducted by Bolivia's Instituto Nacional de Estadística, they found that access to water – measured by access to in-house piped water – expanded at higher rates in La Paz and El Alto than in cities with public provision. They also found that access for poorer households increased substantially in the privatized cities; by 2005, the difference in coverage rates for the poorest 20 percent and the richest 20 percent fell from 30 to 4 percentage points in El Alto and from 15 to 4 percentage points in La Paz.

Even so, the private contracts were terminated. One factor was the failure of the private company to meet all expansion-of-service contract stipulations. More importantly, tariff increases allowed by the concession contracts and enacted by the private company provoked major public outrage. Eventually, the unpopularity of private company attempts to achieve better cost recovery, together with the failure to meet legally binding targets led the governments to end the contracts.

Hailu, Osorio, and Tsukda (2009) concluded that attempts to expand access to the poor cannot be met solely through privatization and require public efforts. Estupinan et al. (2007) also come to similar conclusions on the importance of maintaining affordability for the poor, in public subsidies for transportation.

8.6. Land-based Finance in China

China is currently undergoing a rapid process of urbanization, arguably on the largest scale in human history. Rapid urban expansion has resulted in much arable land being used for non-agricultural purposes. Indeed, a major source of financing for this urban expansion is “land finance”, or the use of land requisition and public leasing, typically at “prices” that are significantly below true market value. The Land Administration Law (LAL) was enacted in 1998, and allows the government to acquire land owned by collectives, if it is acting in the “public interest”. However, there is no clear definition of the public interest, and this lack of clarity has often led the local governments to expand the legal scope of land acquisition. In practice, governments have used the legal right to attain land from farmers or from farmers’ collectives for urban infrastructure development. Of some note, land used for non-public usage such as for industrial, commercial, and residential projects also has to go through the public land requisition procedure, so that in practice nearly all the land used for urban development – whether by public or private enterprises – must be acquired by the local government, converted to state-owned land, and then used for public or private development purposes. This means that under the current LAL neither farmers nor collectives have much power to negotiate directly on the price at which their land will be acquired, and it also means that they cannot make a private transfer of land rights on their own. The compensation terms for land acquisitions are, for the most part, decided unilaterally by the local government that acquires the land.

Under the LAL, the compensation consists of three cash components: compensation for the land (at 6-10 times the estimated land productivity), compensation for resettlement (at 4-6 times the estimated land productivity), and compensation for “accessory assets” in land. Recently, some municipalities have promised farmers a monthly pension upon reaching retirement age, rather than providing cash compensation.

However, municipal governments have typically abused their acquisition powers by offering compensation far below true market value. Such low-cost land acquisition has allowed municipal governments to avoid heavy fiscal burdens of land acquisition, but has also generated significant distortions in land use and major burdens on dispossessed land owners. Cao, Feng, and Tao (2008) report the results of a 17 province, 1962 farmer survey conducted in 2005, which documents the 15-fold increase in local government land acquisition in the previous 10 years and the corresponding increase in farmers’ grievances. Dissatisfaction has apparently contributed to social unrest and political instability; in the first 9 months of 2006, China reported nearly 18,000 cases of “massive rural incidents” largely related to illegal acquisitions, in which 385,000 farmers protested against the government. They also report that there are roughly 40 million dispossessed farmers due to urban expansion. In response, the central government has issued several policy directives in the last several years, but problems apparently remain.

8.7. Government Structure and Government Spending in the United States

Recall that the structure of urban governance is expected to affect the quantity and quality of government services. One aspect of this effect is the impact on government spending. Zax (1989) examines this issue by estimating the effects of the number of governments in a geographical area on the magnitude of government spending, using a sample of 3022 counties for the United States. The sector should shrink if decentralization encourages competition among governments; it should increase if decentralization reduces the scope of scale economies. He finds that larger county governments actually increase the size of government spending relative to county income. He also finds that cities and towns increase competition and reduce government size, while more special districts sacrifice scale economies and increase government spending. In short, decentralization that encourages competition reduces the size of the local public sector; decentralization that discourages scale economies increases government. For some similar evidence for India, see Lalvani (2002).

9. Some “Gaps” in Our Understanding

This review of the literature on urban infrastructure suggests a number of areas in which our understanding is incomplete.

First, what is the extent of municipal infrastructure spending? Data are virtually non-existent. Often the data that exist are compiled by local “experts”. While these data can be useful, they are seldom uniform, representative, comprehensive, comparable across countries, or available for multiple years.

Second, what is the extent of municipal government borrowing for infrastructure? Again, significant data gaps exist.

Third, how can the long-run borrowing capacity of municipal governments be built? The example of Indonesia illustrates that the passage of legislation does not automatically lead to the establishment of the conditions under which local governments actually are able to borrow funds for infrastructure.

Fourth, how can local credit markets be built in developing countries, including establishment of credit agencies?

Fifth, what is the extent of municipal government assets? There is rarely a systematic effort made to compile an “inventory” of local government assets? Given the growth of land-based methods of infrastructure, it is essential for municipal governments to have a comprehensive and accurate inventory of the assets at their disposal. Such inventories simply do not exist.

Sixth, what is the extent of cost recovery from user costs? Data here are typically more widely available, at least on the aggregate level of revenues that are generated.

Seventh, what are the distributional effects of different financing schemes? The case studies indicate the dominant role of distributional issues in public acceptance of many pricing schemes, but full distributional analyses are often unavailable. As only one example, there is a large literature on the “incidence” of impact fees in the United States; there is little comparable work on developing countries, despite the growing use of land-based methods of finance.

Eighth, what is the impact of intergovernmental transfers on infrastructure spending? There is a large empirical literature on how governments respond in their spending decisions to the receipt of transfers, most focusing on the experience of developed countries, especially the United States. Even so, many basic questions here remain unanswered, especially in the context of developing countries. Does money “stick where it hits” (e.g., the so-called “flypaper effect”)? Which types of grants are most stimulative? Are the impacts of capital transfers different than those of transfers that fund personnel and other current expenses?

Ninth, what is the impact of governance on infrastructure spending, including the impact of different governance structures on cost efficiency of service delivery, on the level of government expenditures, and on the accountability of local governments? There is no convincing evidence here. Indeed, the role of institutions is often overlooked, and even when institutions are considered, their roles are not fully understood. Indeed, what are the metrics by which performance can be measured? Is a “successful” infrastructure project one that is financially viability, that delivers services efficiently, that targets delivery to specific income groups, or that achieves some other goals?

Tenth, how can administrative capacity be built? The limitations of administrative capacity (including the existence of corruption) are routinely identified as a major bottleneck for municipal governments, in virtually all dimensions of local government performance. However, the specific steps that should be taken to improve capacity are difficult to identify and complicated to implement. There is also no attempt made to measure systematically the capacity of local government officials or administrators, beyond indicators present in such publications as the World Bank’s *Doing Business* or the World Economic Forum’s *The Global Competitiveness Report*, both of which focus mainly on national considerations of

which only a few relate to tax administration and capacity. Of perhaps more relevance is the recent OECD publication *Tax Administration in OECD and Selected Non-OECD Countries: Comparative Information Series (2008)*, which continues earlier year OECD publications on tax administration. Again, however, these indicators are only available at the national level, and only for a small number of mainly developed countries. There is certainly no understanding of how a lack of capacity affects project implementation, beyond the obvious – and true – observation that poor administration makes successful project implementation unlikely.

Finally, what are the lessons of “ancient” history on infrastructure finance? There is an almost irresistible tendency to focus on “recent” history in devising infrastructure strategies. However, governments have been building infrastructure for thousands of years. There is no doubt that circumstances have dramatically changed over these years. Even so, there is no need to ignore the lessons of this history in current policy discussions. Boxes 10 and 11 indicate the richness – and the relevance – of such “ancient” strategies for today.

Box 10: Some Lessons from “Ancient” History: 19th Century Financing of Railroads

Nineteenth-century infrastructure investments included canals, docks, electric power grids, sanitation systems, telegraph systems, tramways, and turnpikes, but railways were the most prominent and capital-intensive of these investments. Private participation in financing railroad construction was seen then – just as it is seen today – as a way to minimize the inefficiencies of public administration, to reduce the financial burden on governments, and to avoid the need for external borrowing. In fact, for much of the nineteenth century infrastructure projects were privately financed and built.

According to Eichengreen (1995), however, government intervention continued to be important, even with private financing. The ability of domestic financial markets to underwrite the construction of ports, canals, and railways was constrained, in part because of informational asymmetries characteristic of markets in the early stages of development. To help with these problems and to attract private investment, lenders turned to financial institutions that specialized in assessing projects and monitoring management, typically foreign institutions with foreign clienteles whose experience with privately financed projects had given them a head start in raising capital and judging risk. This approach relieved – but did not eliminate – concerns about inadequate information. Further, private investment did not reduce the government's involvement or the need for foreign borrowing. Often, however, government intervention simply replaced one set of problems with another. Because of the difficulties of assessing projects, investors were reluctant to commit their funds, and governments were often forced to use subsidies and loan guarantees to encourage investment. However, investors with government-guaranteed loans had no incentive to monitor the firm's performance, a limitation that led to the diversion of funds and that frustrated the public interest. At the same time, government policies to overcome asymmetric information encouraged management to engage in bankruptcy for profit (a problem termed “looting”).

These nineteenth-century failings have implications for current attempts to exploit nontraditional approaches to financing infrastructure. Two further policy initiatives seem necessary, both of which necessitate government involvement. First, efforts should be made to enhance the effectiveness of public administration, so that government agencies are responsible for monitoring the efficiency and performance of the enterprise, backed by a credible threat of sanctions against managers who are tempted to enrich themselves. Second, policymakers need to encourage the development of financial institutions and instruments that can surmount information problems and relieve the government of the need to provide subsidies and interest guarantees.

Source: Eichengreen (1995).

Box 11: Some Lessons from “Ancient” History: Resource Endowments and the Cost of Capital to Brazilian State Governments

What determines the ability of governments to borrow, and to borrow at low cost? There is a large literature that aims to explain what determines “country risk”, defined as the difference between the yield of a sovereign’s bonds and the risk free rate; there is a much smaller literature that examines the determinants of risk at the subnational level. Fritscher and Musacchio (2009) argue that an important explanatory factor for the cost of capital in Brazilian state governments is the impact that resource endowments have on the capacity of the government to pay. They use a newly created data base with state-level fiscal and risk premium data for Brazil states between 1891 and 1930 to show that Brazilian states with natural endowments that allowed them to export commodities that were in high demand (e.g., rubber and coffee) ended up having higher revenues per capita and, thus lower costs of capital. The variation in revenues per capita was both a product of the variation in natural endowments that had differential impacts on the exports of the states and a commodity boom that also had asymmetric effects among states. These two effects generated variation in revenues per capita at the state level, in part because of the extreme form of fiscal decentralization that the Brazilian government adopted in the Constitution of 1891, which gave states the sole right to tax exports. Their estimation results show that the cost of capital for Brazilian states and the probability of issuing state debt in international capital markets were highly correlated with state revenues per capita. They also find that these variations in the cost of capital had impacts on the states’ capacity to issue debt, their access to capital, and their ability to spend on infrastructure. Indeed, Fritscher and Musacchio (2009) conclude that the setup of the 1891 Constitution promoted some of the regional inequality that is still present today in Brazil.

After 1928 Brazilian states defaulted en masse, and the federal government had to assume all state debts, which led to the end of state debt issues in international markets. By 1934 a new constitution was drafted, and in 1937 Getulio Vargas rewrote the constitution to give the central government more powers, including a new fiscal setup that destroyed the federalist pact of 1891-1930.

Source: Fritscher and Musacchio (2009).

10. Conclusions: “Best Practices” and an Agenda for Research

The key issues in infrastructure finance are simple to state:

- How can municipal governments choose the appropriate infrastructure project, including coordination across government boundaries?
- How can they finance it?
- How can an overall federal structure be created in which incentives – to get the means of financing (e.g., pursue intergovernmental transfers simply because the grant money is available, pursue borrowing simply because it is believed that the central government will bail out municipal governments who cannot repay loans), to maintain the facility (e.g., ignore maintenance simply because it is believed that a new facility will be provided by “others”), to use the facility efficiently and equitably – are not unduly distorted?

Answering these questions is more difficult. The process (s) by which finance schemes are actually chosen is not well understood. The process (s) by which facilities can be financed is plagued with difficulties and uncertainties. It seems very unlikely that municipal governments, especially in the poorer countries, will be able soon to generate the funds needed to build facilities: they do not have access to

capital markets, and they seldom generate significant revenues on their own (e.g., the property tax is unproductive, cost recovery is poor, access to productive revenue sources is limited). The money must therefore come from elsewhere: transfers, private partnerships, privatization, or use of local government assets. Even so, the immediate prospects for significant funding of infrastructure seem, at best, quite cloudy. The process (s) by which incentives can be improved is also difficult to specify. Moral hazard problems abound, especially on municipal borrowing and on their maintenance of facilities.

Given these considerations, my basic conclusions are somewhat pessimistic. As summarized earlier, these conclusions are:

- The “theory” of fiscal federalism has many useful and general guidelines, but the practical and specific relevance of these guidelines remains quite limited.
- In the specific context of municipal infrastructure finance, there is little in the theory that allows one to determine whether one infrastructure “scheme” is “better” than another, whether one scheme will be selected in one scenario and not in another, whether one scheme will “work” in one scenario and not in another, and the like.
- There are in fact numerous examples where one infrastructure scheme “works” in one institutional setting and not in another, seemingly similar setting. There are also numerous examples where countries with seemingly similar institutional settings follow very different paths in infrastructure finance.
- The reasons for these differential outcomes are unclear. Clearly, the often-poor administrative capabilities (including corruption) of municipal government employees are a factor, but other factors seem relevant as well.
- The full effects of different schemes – on service delivery, on income distribution, on poverty reduction, and so on – are seldom fully quantified or understood.
- The extent of municipal infrastructure finance seems quite limited – a result that parallels the limited extent of municipal revenue mobilization more generally, especially from “conventional” sources (e.g., taxes, user charges) – and it seems unlikely that this can and will be changed quickly, if at all.
- In large part, the reasons for the lack of clarity of many of these issues relate to limitations on the availability of basic information: data problems are serious and endemic.

Despite this pessimism, however, I believe that are potentially productive avenues by which our understanding of infrastructure schemes can be enhanced. These avenues include the following types of research activities, which build upon but which also go beyond the discussion of “Some ‘Gaps’ in Our Understanding” in the previous section:

1. Generating more reliable data on various dimensions of infrastructure finance. It is especially important to have basic information on such items as the extent of municipal infrastructure spending and the extent of local government assets, generated via a uniform methodology that allows cross-sectoral, cross-country, and multi-year comparisons of municipality behavior to be made. Such basic information is currently unavailable.
2. Developing data on administrative capacities of local governments. As noted earlier, the OECD has recently begun compiling information for mainly OECD countries on various aspects of the quality of central government tax administration. A similar effort for major municipalities around the world would allow more accurate assessments of administrative capacities of these governments.
3. Incorporating recent approaches to valuing risky investments in project appraisal. Modern finance theory has made important innovations in evaluating private investment projects. These innovations may provide useful insights in evaluating public projects, or social benefit-cost analysis.
4. Incorporating institutional factors, including political elements, in analyses. There is little question that the institutional context, especially local governance, affects the success or failure of infrastructure schemes. However, the specific channels by which these institutions operate are not fully understood.

5. Recognizing the role of non-for-profit organizations in service delivery. The importance of civic society organizations in services is increasingly recognized but insufficiently understood. Do these organizations crowd out municipally provided services, as financially strapped local governments opt out of services in sectors in which they believe not-for-profit organizations operate? Or do not-for-profit organizations act as a complement to municipal government services?

In sum, let me return to and emphasize a common theme throughout: our “theories” provide some general guidance on how to provide infrastructure but little specific advice on the mechanics of infrastructure provision. In fact, Slack (2007) believes that, in a fundamental sense, economics plays little role in many of these actual decisions:

“... rarely are these economic principles used to determine the optimal government structure. More often, the structures that are imposed are dictated by politics, and not economics.

This does not mean, I believe, that our theories – in this domain and elsewhere – are not useful: they provide a necessary framework in which we can think about these issues, and they also often allow us to identify specific policies that are clearly inconsistent with our theories and whose implementation would clearly lead to inefficiencies and inequities. However, practical implementation requires that we also incorporate the specifics of any country’s institutional structure in devising and implementing specific policies.

References

- Ahmad, Ehtisham, Maria Ablino-War, and Raju Singh (2005). "Subnational Public Financial Management: Institutions and Macroeconomic Considerations", *IMF Staff Working Paper*, WP/05/108 (Washington, D.C.: International Monetary Fund).
- Alm, James (1997). "Revenue Assignment and Mobilization in Bangladesh", The World Bank (Washington, D.C.).
- Alm, James and Sri Mulyani Indrawati (2004). "Decentralization and Local Government Borrowing in Indonesia", in *Reforming Intergovernmental Fiscal Relations and the Rebuilding of Indonesia – The 'Big Bang' Program and its Economic Consequences*, James Alm, Jorge Martinez-Vazquez, and Sri Mulyani Indrawati, eds. (Cheltenham, UK – Northampton, MA: Edward Elgar Publishing).
- Alm, James and Jorge Martinez-Vazquez (1997). *Bangladesh Municipal Finance Management Sector Study*, Infrastructure Operations Division, Country Department 1, South Asia Region, The World Bank (Washington, D.C.).
- Alm, James and Jorge Martinez-Vazquez (2009). "Assessing South Africa's Provincial Equitable Share", *ISP Working Paper* (Atlanta, GA: Andrew Young School of Policy Studies).
- Annez, Patricia Clark (2006). "Urban Infrastructure Finance from Private Operators: What Have We Learned from Recent Experience?" *World Bank Policy Research*, Working Paper 4045 (Washington, D.C.: The World Bank).
- Bahl, Roy (1999). "Implementation Rules for Fiscal Decentralization", *Proceedings of the International Seminar on Land Policy and Economic Development* (Taiwan: International Center for Land Policy Studies and Training).
- Bahl, Roy and Richard Bird (2008). "Subnational Taxes in Developing Countries: The Way Forward", *Public Budgeting & Finance*, 29 (1), 1-25.
- Bahl, Roy and Johannes Linn (1992). *Urban Public Finance in Developing Countries* (Oxford: Oxford University Press).
- Bennett, Maybelle Taylor and Leticia Perez (1986). *Block Grants: Beyond the Rhetoric – An Assessment of the Last Four Years* (Washington, D.C.: Coalition on Human Needs).
- Bird, Richard M. (1999). "Rethinking Subnational Taxes: A New Look at Tax Assignment", *IMF Staff Working Paper*, WP/99/165 (Washington, D. C.: International Monetary Fund).
- Bird, Richard M. and Enid Slack (2007). "An Approach to Metropolitan Governance and Finance", *Environment and Planning C: Government and Policy*, 25, 729-755.
- Bird, Richard M. and Francois Vaillancourt, eds. (1998). *Fiscal Decentralization in Developing Countries* (Cambridge: Cambridge University Press).
- Davey, Ken (1988). "Municipal Development Funds and Intermediaries", Background Paper for 1988 *World Development Report* (Washington, D. C.: The World Bank).
- Dillinger, William, Guillermo Perry, and Steven B. Webb (1999). "Macroeconomic Management in Decentralized Democracies: The Quest for Hard Budget Constraints in Latin America", *Framework for Fiscal Federalism*, 85-105.
- Eichengreen, Barry (1995). "Financing Infrastructure in Developing Countries: Lessons from the Railway Age", *The World Bank Research Observer*, 10 (1), 75-91.

- Finegold, Kenneth, Laura Wherry, and Stephanie Schardin (2004). "Block Grants: Historical Overview and Lessons Learned", The Urban Institute, *New Federalism – Issues and Options for the States*, Series A, No. A-63 (Washington, D.C.).
- Fox, William F. (1994). *Strategic Options for Urban Infrastructure Management* (Washington, D. C.: The World Bank).
- Fox, William and Kelly Edmiston (2000). "User Charge Financing of Urban Public Services in Africa", *ISP Working Paper*, Number 00-04 (Atlanta, GA: International Studies Program, Andrew Young School of Policy Studies, Georgia State University).
- Freire, Maria E., Marcela Huertas, and Benjamin Darche (1999). "Subnational Credit Markets: Selected Cases", *Local Financing and Management Capacity*, 375-393.
- Frischer, Andre C. Martinez and Also Musacchio (2009). "Endowments, Fiscal Federalism, and the Cost of Capital for States: Evidence from Brazil, 1891-1930", Harvard Business School Working Paper Working Paper 10-027.
- Guthrie, Graeme (2006). "Regulating Infrastructure: The Impact of Risk and Investment", *The Journal of Economic Literature*, 44 (4), 925-972.
- Gwilliam, Kenneth M. (2002). *Cities on the Move: A World Bank Urban Transport Strategy Review* (Washington, D.C.: The World Bank).
- Hailu, Degol, Rafael Guerreiro Osorio, and Raquel Tsukada (2009). "Privatization and Renationalization: What Went Wrong in Bolivia's Water Sector?" *International Policy Center for Inclusive Growth*, Working Paper No. 58 (Brasilia, Brazil).
- Hwang, Son, and Eom (1999). "Road Pricing and Traffic Congestion in Korea".
- Lane, Timothy D. (1993). "Market Discipline", *IMF Staff Papers*, 40 (1), 53-88.
- Lewis, Blane D. (2003). "Local Government Borrowing and Repayment in Indonesia: Does Fiscal Capacity Matter?" *World Development*, 31 (6), 1047-1063.
- Lalvani, Mala (2002). "Can Decentralization Limit Government Growth? A Test of the Leviathan Hypothesis for the Indian Federation", *Publius*, 32 (3), 25-46.
- McLure, Charles E. Jr. (1994). "The Tax Assignment Problem: Ends, Means, and Constraints", *Australian Tax Forum* 11 (2), 153-183.
- Musgrave, Richard A. (1959). *The Theory of Public Finance* (New York, NY: McGraw-Hill Book Company).
- Musgrave, Richard A. (1983). "Who Should Tax, Where, What?" In Charles E. McLure, Jr. (ed.), *Tax Assignment in Federal Countries* (Center for Research on Federal Financial Relations, 2-19).
- Nabutola, Wafula (2006). "Financing Urban Infrastructure Development and Maintenance with Particular Reference to Nairobi", *Promoting Land Administration and Good Governance 5th FIG Regional Conference*, Accra, Ghana.
- Nallathiga, Ramakrishna (2009). "Private Sector Participation in the Provision of Urban Water Supply: Examining the Options and Scope in Mumbai", *The Icfai University Journal of Infrastructure*, 7 (2) 27-39.

- Nallathiga, Ramakrishna (2009). "Envisioning a Comprehensive Transport Strategy for Mumbai", *Quarterly Indian Journal of Transport Management*, 9, 71-86.
- Nicolini, Juan Pablo, Josephina Posadas, Juan Sanguinetti, Pablo Sanguinetti, and Mariano Tommasi (2002). "Decentralization, Fiscal Discipline in Subnational Governments, and the Bailout Problem: The Case of Argentina", *IDB Working Paper*, No. 467 (Washington, D.C.: Inter-American Development Bank).
- Noel, Michel (2000). "Building Sub-national Credit Markets in Developing and Transition Countries – A Framework for Analysis, Policy Reform, and Assistance Strategy", Private and Financial Sector Development Department Working Paper (Washington, D.C.: The World Bank).
- Oates, Wallace (1972). *The Economic Theory of Federalism* (Englewood Cliffs, NJ: Harcourt, Brace, and Jovanovich).
- Oates, Wallace E. (1993). "Federalism and Government Finance". In John M. Quigley and Eugene Smolensky (eds.), *Modern Public Finance* (Boston, MA: Harvard University Press, 126-151).
- Oates Wallace (1999). "An Essay on Fiscal Federalism", *The Journal of Economic Literature*, 37 (3), 1120-1149.
- Olken, Benjamin A. and Monica Singhal (2009). "Informal Taxation", Working Paper.
- Peterson, George E., Randall R. Bovbjerg, Barbara A. Davis, Walter G. Davis, Eugene C. Durman, and Theresa A. Gullo (1986). *The Reagan Block Grants: What Have We Learned?* (Washington, D.C.: Urban Institute Press).
- Peterson, George (2000). "Building Local Credit Systems", Urban Management Program Working Paper (Washington, D.C.: The World Bank).
- Peterson, George (2009). *Unlocking Land Values to Finance Urban Infrastructure*, Trends and Policy Options Series (Washington, D.C.: PPIAF).
- Robins, Leonard (1976). "The Impact of Converting Categorical into Block Grants: The Lessons from the 314(d) Block Grant in the Partnership for Health Act", *Publius*, 6 (1), 49-70.
- Slack, Enid (2007). "Managing the Coordination of Service Delivery in Metropolitan Cities: The Role of Metropolitan Governance", *World Bank Policy Research Working Paper*, WPS4317 (Washington, D. C.: The World Bank).
- Slack, Enid and Rupak Chattopadhyay, eds. (2009). *Finance and Governance of Capital Cities in Federal Systems* (McGill, Canada: McGill Queen's University Press).
- Stenberg, Carl W. and David B. Walker (1977). "The Block Grant: Lessons from Two Early Experiments", *Publius*, 7 (2), 31-60.
- Tanzi, Vito (1996). "Fiscal Federalism and Decentralization: A Review of Some Efficiency and Macroeconomic Aspects". In *Annual World Bank Conference on Development Economics*, Michael Bruno and Boris Pleskovic, eds. (Washington, D.C.: The World Bank).
- Ter-Minassian, Teresa (1996). "Borrowing by Subnational Governments: Issues and Selected International Experiences", International Monetary Fund, Fiscal Affairs Department, PPAA/96/4.
- Ter-Minassian, Teresa and Jon Craig (1997). "Control of Subnational Government Borrowing". In *Fiscal Federalism in Theory and Practice*, Teresa Ter-Minassian, ed. (Washington, D.C.: International Monetary Fund), 156-172.

Tiebout, Charles Charles M. Tiebout, A Pure Theory of Local Expenditures, 64 J. Pol. Econ. 416 (1956);

U.S. General Accounting Office (GAO) (1982). *Lessons Learned from Past Block Grants: Implications for Congressional Oversight*, GAO/IPE-82-8 (Washington, D.C.).

Zax, Jeffrey S (1989). "Is There a Leviathan in Your Neighborhood? *The American Economic Review*, 79 (3), 560-567.

Zhong, Lijin, Arthur P. J. Mol, and Tao Fu (2008). "Public-private Partnerships in China's Urban Water Sector", *Environmental Management*, 41, 863-877.