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Infrastructure Finance in the Developing World

Public Finance Underpinnings for Infrastructure Financing in Developing Countries

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About the project

The *Infrastructure Finance in the Developing World Working* Paper Series is a joint research effort by GGGI and the G-24 that explores the challenges and opportunities for scaling up infrastructure finance in emerging markets and developing countries. Each paper addresses a unique piece of the infrastructure finance puzzle and provides critical analysis that will give impetus to international discourse and play a catalytic role in the creation and success of new development finance institutions. The papers have been authored by top experts in their respective fields, and the process has been carefully guided by the leadership of both organizations. This work has important implications in the post-2015 environment, given the essential role infrastructure must play in achieving sustainable development. To this end, GGGI and the G-24 look forward to further development and operationalization of the contents of these papers.

Public Finance Underpinnings for Infrastructure Financing in Developing Countries

Ehtisham Ahmad[1]

1. Introduction

There is growing recognition on the need for a substantial ratcheting up of investment in developing countries—not just to meet the significant gaps in infrastructure and new investment requirements (see the companion paper to this volume on infrastructure needs by Battacharya and Holt 2014, as well as G30 2013), but also to ensure sufficient financing for operations and maintenance of past investments and retooling of production techniques to meet the requirements of sustainable development (Bhattacharya, Romani, and Stern 2012). Despite the availability of investible resources, especially prior to the post-2008 economic crisis, the heavy reliance on bank finance for cross-border transactions is inadequate, as indicated by the G30 report. This is understandable, given the risks involved and the paucity of reliable information, even in developed countries. Moreover, the gaps in infrastructure cannot be filled by domestic public resource mobilization alone, as stressed by Bhattacharya, Romani, and Stern (2012).

This paper examines the public finance underpinnings for an enhanced focus on different types of long-term investments as well as on operations and maintenance of existing investments. Even with public–private partnerships (PPPs) recommended by the G30, public resources are needed to fill the funding gap. PPPs face significant difficulties due to incomplete information, especially in multilevel countries, and incentives to use the PPPs to kick the fiscal can down the road or renege on contracts (see the companion paper by Ahmad et al. 2015). There is a strong case for multilateral third-party involvement in providing assurance that contracts will be respected, as well as in helping to ensure the generation of reliable, standardized information.

It is of course not reasonable to expect that all the additional investment requirements should be met from public resources. This is partly because investments represent long-term improvements in living standards, and it is therefore appropriate that the costs of provision should be shared with future generations. Moreover, implementation of tax reforms takes time. Thus, there is a strong case for concessional multilateral support. However, this should not be at the expense of, or as a substitute for, a serious domestic resource mobilization effort.

2. Public Revenues and Alternative Instruments

2.1. The Public Finance Envelope and Revenue Generation

While not all infrastructure requirements will be financed by the public sector, sufficient unencumbered resources need to be generated to cover the provisioning required while still meeting the buildup of public liabilities over time. In other words, the tax/GDP ratios of countries will need to rise sufficiently to cover the provision of basic needs, operations and maintenance spending, as well as the public component of the needed accretions in infrastructure spending.

A rule of thumb for the financing requirements for the 2015 millenium development goals (MDGs) was a tax/GDP ratio of approximately 18%. However, country circumstances vary, and whether a country has access to natural resources makes a difference (Table 1). Thus, tax/GDP ratios of 11% in Mexico and 18% in China imply a similar overall revenue envelope of 23%, but there is a significant tax reform agenda in each case. Both cases have interesting lessons for other developing countries.

Table 1. General Government Tax Revenues as % of GDP, G-24 Countries (2013 or latest year)

Country	2013
Algeria	35.22%
Argentina	29.90%
Brazil	24.07%
China	20.94%
Colombia	19.91%
Democratic Republic of Congo	2.84%
Côte d'Ivoire	17.24%
Egypt	14.32%
Ethiopia	10.12%
Gabon	14.91%
Ghana	15.34%
Guatemala	10.81%
India	16.98%
Islamic Republic of Iran	5.18%
Lebanon	15.14%
Mexico	10.38%
Nigeria	15.29%
Pakistan	9.74%
Peru	16.09%
Philippines	14.14%
South Africa	24.56%
Sri Lanka	11.70%
Syrian Arab Republic	
Trinidad and Tobago	27.37%
Venezuela, República Bolivariana de	10.35%

Source: April 2014 WEO; 2013 Staff report for Sri Lanka.

The Chinese tax/GDP ratio has increased to approximately 20%, from approximately 11% in 1992. This was largely predicated on the introduction of a value-added tax (VAT) to avoid distorting incentives to invest and to generate revenues. However, VAT implementation was accompanied by a significant transfer design, with an equalization framework, as well as revenue transfers aimed at maintaining investment in growth hubs. Thus, the lesson is that one should not consider VAT in isolation, but as part of a tax-benefit framework in which the effects of structural change and implications for distribution might be assessed.

However, China continues to pursue a significant tax reform agenda (see Ahmad, Rydge, and Stern 2013). Given financing requirements for structural change and environmental sustainability, in addition to the need to raise spending on education, R&D, and healthcare (given its ageing population), the Chinese tax/GDP ratio needs to increase further (see Table 2). In particular, sub-national tax handles are needed to effectively anchor the development of local capital markets and the management of liabilities.

In the Mexican case, the 2013 reforms show the significance of a "package approach" to tax reforms. The government managed to conduct reforms to VAT, corporate income tax (CIT), personal income tax (PIT), excises, and trade taxes, as well as taxes affecting the petroleum sector with a minimum resort to compensate for each instrument. Successive governments had tried to implement a tax-by-tax reform to specific instruments, such as VAT, but were unable to do so. To some extent, winners and losers were offset and the reforms focused on enacting an appropriate set of incentives for investment and sustainable growth, and to close the opportunities for rent seeking and informality. Given that Mexico has access to petroleum revenues, it has some space to focus on incentives and growth in the medium term, which also presents the possibility for additional tax revenues to replace declining petroleum reserves.

One of the main lessons from the Mexican reforms is the use of VAT to generate information on the value chain, which can then be used to address evasion and cheating in income taxes. Notably, Mexico chose not to tax unprocessed foods consumed by the poor, but focused on closing the special rates and exemptions that were designed to promote investment or for the benefit of special interest groups. While these reforms are meant to have an impact over the medium term, significant progress has been made in structural terms. The lessons concerning interactions between taxes and informality are relevant even for countries such as Colombia, China, and Chile, all of which have much higher tax/GDP ratios than Mexico. However, the sub-national tax reform agenda remains, as in most other G-24 countries.

India also benefitted from tax reforms that raised general government revenues in the 1990s close to 20% of GDP, which is considered inadequate in relation to its spending needs (see IMF 2013). The appropriate revenue envelope for India should be approximately 25% of GDP. An Empowered Committee of State Finance Ministers recommended consolidating the split bases for the goods and services tax (GST), and this remains one of the priorities of the Union government elected in 2014. This would minimize the burdens on exporters to enable them to compete more effectively in an increasingly competitive world market.

Non-oil producing countries with very low tax/GDP ratios (especially those with ratios of 10% or less) will likely have inadequate resources for the minimum public investment for infrastructure or its components, including education and R&D, as well as be able to fund operations and maintenance.

Table 2. Tax Revenue and Expenditure for Selected Countries/Regions (% of GDP)

	Germany 2010	Australia 2010	China 2009[1]	Brazil 2010[2]	OECD average (excl. US 2010)	EU-27 average 2010
Revenue	43.3	32.5	27.6	36.7	41.4[3]	44.1
Tax Revenue	22.2	25.7	18.9	25.4	34.0	25.8
Income Taxes	10.6	14.4	4.6	6.9	11.3	11.5
Goods and Services	10.8	7.1	12.1	15.7	11.2	11.2
Property Tax	0.8	2.5	1.7	1.3	1.7	1.3
Social Contributions	16.8	-	3.6	6.6	10.6[4]	12.9
Expenditure	47.6	38.0	28.3	39.5	46.6[5]	50.6
Social Benefits	25.4	10.6	-	8.2	26.1[5]	21.6
Functional Spending						
Health	7.2	6.8	1.3	4.1	6.8[6]	7.5
Education	4.3	6.1	3.8	5.5	5.7[6]	5.5

Notes:

1 Data unavailable for 2010; 2009 data used.

2 Data unavailable for 2010 for Functional Spending (Health and Education); 2009 data used.

3 Data unavailable for New Zealand, and Chile.

4 Data unavailable for Australia, New Zealand and Chile.

5 Data unavailable for New Zealand.

6 Data unavailable for Canada, Chile, Mexico, New Zealand, and Switzerland.

Sources: International Monetary Fund (IMF) Government Finance Statistics (December 2012 Edition); ESDS International, University of Manchester; World Bank Indicators; OECD Tax Statistics (database); and Eurostat.

Source: Ahmad, Rydge, and Stern (2013).

In sum, poor revenue performance is due to "holes" in tax instruments, especially VAT or CIT, designed to provide preferences to specific groups, including favored sectors to encourage growth. This is short-sighted as special preferences in major taxes create handles for rent seeking. Moreover, they weaken incentives to operate efficiently and reduce overall growth potential. These holes should be avoided as far as possible. As mentioned, the 2013 Mexican Fiscal Package sought to close such holes to create a level playing field.

2.2. Alternative Investment Instruments and Fiscal Implications

The G30 report projects the rapidly growing stock of financial assets in emerging markets—rising from $41 trillion in 2010 to $141 trillion by 2020—increasing from approximately 21% of the global total to 36% during this period. The Chinese share in the emerging markets financial assets declines slightly from 52% to 46% in this period. Sovereign wealth funds (SWFs) and central banks of resource rich countries are expected to significantly increase their holdings. Some of these resources could be utilized to fund investments in developing countries through appropriately designed instruments and risk-mitigating institutional arrangements. However, as indicated in the G30 report, instruments required for longer-term cross-border financing are lacking. Moreover, ignoring the overall resource envelopes and their distributions in recipient countries is not possible.

Much cross-border investment financing has been conducted through bank lending (including in the major European economies). In emerging markets, commercial bank loan maturities have tended to be approximately 2.8 years—and experienced considerable volatility, as seen during the financial crisis (Rajan 2010). While the development of new and more appropriate instruments for long-term investment remains apriority, many options have significant fiscal implications. Some alternatives include

- New and workable models for PPPs (G30 Option 4a, p.53);
- Credit/risk guarantees (provided by national governments, or multilateral banks) (G30 option 4b);
- Project-specific risk mitigation—through guarantees and public sector subsidies (G30 option 4c).

Each of these alternative instruments has fiscal implications, some of which we explore below. Underlying the proposals is the need for greater transparency and use

of standardized recording and reporting of both sources and uses of funds, as well as of the effectiveness and results of the investment.

PPPs have long been exploited in advanced as well as developing countries as a means of kicking public liabilities down the road—often, with the expectation that the tab would be picked up during the tenure of subsequent administrations. Glossing over the P for public, PPPs became vehicles for relaxing budget constraints and bringing benefits in the short-run in terms of building infrastructure as well as providing employment. As there is little or no cost to an administration that enters into such agreements, less attention is given to the PPPs, and consequently little accountability for the results. Given the difficulties that have been observed worldwide, international standards have been tightened to ensure recognition of public liabilities as these are incurred, with the need for explicit provisioning in budgets. Thus, PPPs cannot be considered as a magical mechanism to facilitate investment without fiscal implications (see Ahmad et al. 2015).

Guarantees generate liabilities that have to be provisioned against, and public sector subsidies feature directly in budgets. Thus, there is no escaping the public finance implications of alternative mechanisms to finance infrastructure by innovative means—although the time profile of different options varies considerably. Unless the full implications of liabilities over time are recognized, it is possible to “play games” and avoid taking full responsibility for spending decisions (this is comprehensively discussed in Section IV).

Public spending will constitute, on average, approximately a third of total investment. However, an examination of spending patterns in the G30 sample of mature and emerging market economies suggests that the level of direct public provision varies by type of investment—averaging 75%–85% of critical education spending and 60%–65% of traditional infrastructure spending of the “bricks and mortar” type. Furthermore, the public sector plays a significant role in R&D, constituting 25%–30% of the direct spending. However, public sector spending is typically needed to “facilitate” private sector investment—ensuring that the critical facilities are available to provide linkages to markets—reliable power, rail, road, and port facilities—and ensuring availability of an educated and capable workforce.

Furthermore, private liabilities, especially for investment projects that lose its attraction, can become public liabilities, especially if they are of a sufficiently large magnitude that they could affect macroeconomic stability. This was the case with road building at the state level in Mexico in the 1990s. Even though the federal government did not guarantee these investments, they had to be assumed by the government following the tequila crisis to ensure stability in the banking system. A similar situation was faced during the recent Euro crisis due to the excessive private sector real estate development in Spain (in many cases due to close links between regional governments and the *cajas*). Again, the central government has had to assume the liabilities, with the result that the debt/GDP ratio and the associated annual fiscal deficit suddenly surged above Maastricht levels (after years of being well within limits before the crisis). An analogous problem occurred in Ireland—with private sector liabilities being transformed into public sector debt. In addition to better prudential management, it is useful if a “fiscal cushion” exists in case of such potential surprises.

The solutions to the problems in southern Europe and other parts of the “mature” world afflicted by fiscal consolidation are to ensure the continuation of growth, sustainable investment, and employment generation. This largely involves tax reforms to provide a more efficient environment for investment, as well as a rebalancing of expenditures to eliminate waste and leakages, while simultaneously ensuring additional resources for sustainable investment purposes.

3. Meeting the Looming Revenue Challenge

International agencies and governments have significantly focused on the level of general government revenues as a proportion of GDP—e.g., the target of 18% of GDP required to meet the 2015 MDG goals. This is clearly a very important element of the revenue challenge, and it governs the extent to which some countries are able to take advantage of opportunities for investment as well as the ease with which they face challenges associated with economic shocks and cyclical downturns. However, much depends on initial conditions and whether a country has access to natural resources. This target should also be amended to consider the need for additional spending on infrastructure and climate change. Thus, country-specific assessments are needed to gauge the need for (1) additional tax revenues, (2) assignments of own-source revenues at different levels of government, and (3) linkages with capital markets and access to credit.

A framework to assess the combination of tax instruments can be derived from the theory of reform (see Ahmad and Stern 1991), in which the effects of changes in the effective taxes can be worked out for any tax not only in terms of revenues but also for production incentives and distributional consequences, given the effective tax element in the price of goods.

Recent studies have extended tax reform models to incorporate the effects of tax measures on informality and incentives to cheat. Evidence from two countries struggling with tax/GDP ratios stuck approximately at 10%, namely Mexico and Pakistan, suggests that gaps in taxes (often due to distributional or production-related considerations that typically degenerate into vested

interests) create opportunities to cheat and evade taxes (Ahmad, Pöschl, and Zanola 2013). These incentives are important and exacerbate tendencies for informality due to the system of formal benefits and taxation of labor, especially in Latin America, stressed by Levy (2008). Even in countries with higher tax/GDP ratios, such as Brazil and Chile, both the design of specific taxes and the combination of taxes matter.

Whether a country is rebalancing taxes in a revenue-neutral manner, or raising additional revenues, the following considerations will be important:

- Effects of tax policies on the incentives to invest—a critical element in driving structural change and generating sustainable growth;
- Effects on households in different circumstances—an analysis of winners and losers will simultaneously require the assessment of tax and social policies;
- Interactions among taxes, the generation of information on transactions and activity levels and incentives to evade;
- Revenue assignments among different levels of government that affect the accountability of more junior levels to act responsibly and manage investments with the care necessary to ensure sustainability. The political economy of reform in multilevel countries has to be considered in specific cases.

Thus, the overall revenue challenge involves levels of taxation, the composition and design of tax instruments, as well as the administrative and intergovernmental implications of efficient tax policy design. We sequentially address each of these issues.

3.1. Design and Instruments

Clearly, a tax system should generate revenues. This should also involve a joint assessment of spending and investment needs as well as consider the relative role of the state in generating economic activity and growth. Note that even laissez faire Chile had a tax/GDP ratio of 20% in 2010 (see IMF 2011) and an overall revenue-to-GDP ratio of 24%. Former president Ricardo Lagos considered both the level and composition of Chilean taxation as being inadequate to meet the challenges of the middle-income trap and the aspirations of the population for a higher quality of public education (Lagos 2013). The Bachelet administration plans to finance the additional spending on education for sustainable growth through an additional tax revenue generation effort of 3% of GDP.

Atax system has to generate appropriate production incentives, influence investment and consumption patterns, and be easy to administer without affecting incentives for cheating and informality. In addition, tax measures directly affect income and consumption by households in different circumstances and generate revenues for redistribution to the poor.

The key issue vis-à-vis investment (other than financing) is whether there should be special preferences to encourage particular sectors or regions. Investment decisions are typically governed by the ease of doing business as well as linkages with supply chains and proximity to markets. Tax breaks matter more in regimes with punitive rates. Given the mobility of capital, there has been an effective international convergence in CIT rates toward the 25%–30% range. VAT is a neutral vis-à-vis investment[2] and trade. Consequently, with a modern structure of the tax system—relying on a VAT and CIT at reasonable levels[3]—there is relatively little justification for special regimes to attract investment, especially if these imply running down a country's physical infrastructure or causing it to stumble from one macroeconomic crisis to another (as has been the case, for example, in Pakistan).

Within countries, special regimes provide ample opportunities for rent seeking, and once favors are bestowed, vested interests coalesce and it becomes very difficult to take away these preferences. Indeed, the interactions between "holes" in different types of taxes compound the temptation to cheat. This is facilitated when administrations are relatively weak and information on transactions is incomplete. Rather than providing tax preferences that may become permanent and thus sources for rent seeking, it may be better for the government to directly invest in meeting the infrastructure deficits of depressed or remote areas, or provide targeted and time-bound subsidies if necessary. In many cases, facilitating labor mobility from disadvantaged areas may be a more efficient option (see Ahmad 2012 for a discussion of the Chinese case).

The holes in VAT leading to a break in the information chain are particularly damaging, especially for the CIT. As shown by Ahmad, Best, and Pöschl (2013) for Mexico, these holes exacerbate the tendencies to operate in an informal mode as highlighted by Antón, Hernández and Levy (2012), and Levy (2008)—due to the higher cost of operating in a formal environment, for example, due to the payroll tax. This reduces firm profits and possibly workers' take-home wages as well, relative to the case where the firm is able to hide some or all of its operations from the tax administration.

When holes are present in the tax system, the entire economy can degenerate into a "hard to tax" model[4]that penalizes honest taxpayers, reduces revenues and potential investment, and might lock a country into a lower growth trajectory than might otherwise be achievable. This dynamic should be distinguished from tax issues concerning traditional "hard to tax" sectors typically found in developing countries—such as street vendors and small-scale agricultural workers. Such tendencies are apparent in countries such as Pakistan—involving both large and small-scale sectors.

Distributional objectives for VAT should be minimized to items consumed by the poorest that do not enter

inter-industry transactions. This could include unprocessed foods mainly consumed by the poorest groups of society—and would minimize the need for compensatory measures. In general, the desired differentiation of an indirect tax system, given the interest of policy makers in protecting the poor and ensuring equity, could be met by a combination of tax tools that would also include excises on items consumed by the rich—in addition to a single rate VAT with minimum exemptions (see Ahmad and Stern 1991). With VAT, the Vito Tanzi (2010) recommendation to keep it simple is supported in recent research that emphasizes the importance of closing avenues to cheat (Ahmad, Best, and Pöschl 2013).

VAT remains one of the main sources of revenue, not just in developing countries but also in advanced countries undergoing fiscal consolidation (see Table 3). In the countries undergoing fiscal consolidation due to the economic crisis, there has been an attempt to change the composition of taxes—shifting from distortive payroll taxes that encourage capital intensity (and informality in developing countries) to a VAT—this is in the expectation that the burden on firms would be reduced, encouraging increased investment. This is similar to the argument made for developing countries to move from distortive trade taxes and import duties to a VAT. Countries such as Pakistan reduced trade taxes but failed to implement VAT effectively, increasing vulnerability as the tax/GDP ratio continued to decline.

Information generated from a properlydesigned VAT is needed to address cheating in the CIT; it can also provide the basis for an efficiently operating PIT. Given the difficulty that most developing countries have in collecting the PIT, especially on non-wage incomes, the focus tends to fall on the CIT to capture the income generated through dividends and profits.

Given the mobility of capital, CIT revenues are subject to transfer pricing arbitrage. Consequently, CIT rates have converged toward the 20%–25% range—China unified its CIT at 25% Clearly, addressing transfer pricing and CIT evasion requires significant international cooperation and actions against tax havens. The UK, such as Ireland, Luxemburg, or the Channel Islands, has used low-tax havens to act against companies that engage in tax avoidance. However, many developing countries are unable to effectively tax domestic companies that do not benefit from international shelters—of more than 40,000 firms registered under the Companies Act in Pakistan circa 2010, only a quarter were registered for tax purposes, and of these, only approximately 10% paid any tax. Many Latin American countries implemented a gross assets tax (GAT), creditable against the CIT, to force companies to

Table 3. Collection of Taxes on Goods and Services, Selected G-24 Countries

General government tax on goods and services as a percent of GDP				
Country	2010	2011	2012	2013
Algeria	4.29%	3.94%	4.32%	4.47%
Brazil	13.76%	14.01%	14.16%	14.17%
China	9.54%	9.49%	9.63%	9.93%
Democratic Republic of Congo	3.99%	4.43%	5.28%	4.46%
Côte d'Ivoire	4.20%	3.12%	3.03%	2.87%
Ethiopia	2.83%	3.10%	3.17%	2.61%
Gabon	2.26%	2.22%	2.02%	2.83%
Ghana	5.21%	5.85%	5.54%	5.37%
Guatemala	5.10%	5.24%	5.31%	5.10%
India	7.77%	8.02%	8.71%	8.87%
Islamic Republic of Iran	0.87%	0.98%	1.04%	1.36%
Lebanon	6.25%	6.10%	5.85%	5.66%
Nigeria	3.46%	4.53%	4.38%	3.98%
Pakistan				3.00%
Peru	7.47%	7.31%	7.31%	7.66%
Philippines	5.52%	5.76%	6.10%	6.45%
South Africa	8.45%	8.72%	8.74%	8.97%

Source: April 2014 WEO.

pay some tax. While a pure revenue measure, the GAT can create distortions against investment. Consequently, Mexico adopted a value-added version of the assets tax—the IETU—again creditable against CIT liabilities in 2007. However, with the 2013 reform that included the simplification and tightening of VAT and cross-strengthened cross-checks with the CIT, the IETU was abolished.

Using data from VAT to cross check CIT is one of the reasons why countries are moving toward a unified administration for VAT and income taxes, together with a joint data warehouse. Nonetheless, it is typically the case that CIT collections are generally not more than half of potential VAT collections (dependent, of course, on the relative rate structures of the two taxes). Countries fair well if they manage to collect 4% of GDP with a 25% CIT rate, as in China (Table 4).

PIT tends to be one of the worst performing taxes in developing countries—given weaknesses in administration and information on value added. Addressing the "information gaps" in relation to balance sheets and income flows is critical to cope with a relatively hard-to-tax base. Improvement of tax administrations associated with an integrated VAT would help close loopholes and bring hard-to-tax groups into the tax net. In addition, much scope exists for the use of third-party information that has become readily available in many countries and is increasingly being used for the allocation of social benefits. Ricardo Lagos (2013) highlighted the differences in the operation of the PIT between OECD countries (excluding Mexico) and Latin American countries—the former has a pretax Gini of 0.48, which declines to 0.29 after tax; whereas in Latin America, the pretax Gini of 0.56 only declines to 0.54 after tax.

Indeed, in the final analysis, it is important to juxtapose the effects of the tax system alongside the spending side of the equation to generate an overall tax-benefit assessment. To the extent to which a simple VAT, which is generally assumed to be at best proportional if not regressive, efficiently generates revenues without discouraging investments or exports, and the additional resources are used for public services for the poor or employment generating public investment, the overall effects may well be progressive. The net effects significantly depend on income and consumption patterns in specific countries, and suggest that a case-by-case assessment should be conducted.

The tax system can be used to discourage the consumption of "bads" that generate negative externalities—including carbon emissions. Ahmad and Stern (2010) extended earlier models concerning the design of the tax system, including externalities associated with tobacco consumption, the case of reducing carbon emissions through a carbon tax. In this case, the probable effects on poor households would require compensatory mechanisms to be part of a package of measures (see Ahmad and Stern 2010). It is thus important to consider the tax and transfer system as part of a comprehensive package of reforms, lest considerable resistance arise to otherwise desirable tax measures.

These principles were also adopted in the 2013 Mexican tax reforms, which included a carbon tax above an average international price to eliminate implicit subsidies as well. Fuel subsidies are estimated to be in the range of US$200 billion in 2011, and their elimination could reduce greenhouse gas emissions by 6% by 2050 (Keen 2013). Depending on the base and level, it is easy to project revenues from a carbon tax between 1% and 1.5%

Table 4. CIT Collections, Selected G-24 Countries

General government taxes on income, profits, and capital gains, payable by corporations as a percent of GDP				
Country	2010	2011	2012	2013
Algeria	2.64%	2.08%	1.96%	2.09%
Brazil	4.06%	4.54%	4.20%	3.29%
China	3.20%	3.54%	3.78%	4.08%
Gabon	4.15%	5.43%	4.16%	4.84%
Ghana	2.15%	2.62%	3.23%	2.67%
India	3.84%	3.58%	3.52%	3.48%
Islamic Republic of Iran	2.69%	2.58%	2.50%	2.05%
Peru	4.44%	5.22%	5.16%	4.14%
Philippines	3.11%	3.48%	3.51%	3.68%
South Africa	5.59%	5.65%	5.76%	5.62%

Source: April 2014 WEO.

of GDP. The resources generated could also be used to restructure industries and encourage investment in more environmentally friendly alternatives.

As emphasized above, carbon taxes should be considered in tandem with other measures to protect the poor losers, but care should be taken not to create permanent entitlements. Conditional cash transfers were used to facilitate Indonesia's 2008 energy pricing reforms. The major energy pricing adjustments in 2014, however, were linked to broader social policy objectives, such as universal health coverage, that do not distort incentives to participate in the labor market.

3.2. Enhanced Subnational Responsibility

Subnational revenue generation is particularly important from the perspective of accountability for investment, given the increasing proportion of such spending at the subnational levels of government. This is critical if local governments are to have systematic access to credit for needed infrastructure. As argued by Ambrosiano and Bordignon (2006), own-source revenues are needed to assure credibility in terms of eventual local repayment of liabilities generated—if financed by shared revenues or central transfers, the responsibility passes to the central government. A key issue in ensuring accountability at the subnational level is through the flexibility of the relevant junior level of government to have the following:

- Control over the rates for a major tax base at the margin—this could be bounded (e.g., in unitary states, the central legislature could set a band and the local government could choose) or be completely up to the local/state/provincial level of government (see Ambrosiano and Bordignon 2006);
- The local government should have incentives to use the assigned tax base—e.g., not have automatic financing of deficits incurred—wherein there is no incentive to use the tax base.

Note that control over tax rates is not necessarily linked with administration of the tax. It is perfectly feasible to assign "own-source" revenue status to a local government if it can control rates at the margin—e.g., as with subnational governments piggy-backing on the federal income tax in the US—without setting up an elaborate machinery. The key element is thus not the revenues, which accrue to a junior jurisdiction, but the control at the margin. Thus, a shared revenue source, which may be quite substantial, e.g., for Chinese local governments, is not exactly considered to be own-source revenue, even if the funds are not earmarked.

Besides Brazil and India, relatively few governments in developing countries have effective own-source revenues at the subnational level—particularly, at the middle tier of the government. However, the VAT's split base creates significant problems in both India and Brazil. China and Australia decided to cut the Gordian knot and place VAT under the administrative control of the central tax administration, with shared revenues in the Chinese case; in Australia, all VAT revenues form the basis for equalization transfers managed by the Commonwealth Grants Commission (see Searle 2010). Given the pressure on VAT to efficiently generate revenues, there is a strong incentive to examine Australia's or China's solution (which is still evolving, and the process is managed by the Ministry of Finance rather than an independent Grants or Finance Commission).

Financing is needed also at the municipal level, given the increasing importance of urbanization as a phenomenon and source for growth. The typical instrument used in most developed countries is the property tax. However, its potential has not been adequately explored in developing countries. In many cases, the cadaster is either not complete or is obsolete, with valuations based on historical records rather than current market prices. Moreover, the rates tend to be set by higher levels, with administration and "exemptions" at the local level. As there is often a "game" played by the level of government, local governments (which in many Latin American countries are subject to single term limits) have few incentives to implement a very visible tax when it is relatively easy to press for additional transfers or run arrears that will become some else's problem in the next electoral cycle—or will be cleared by the center in case of macroeconomic difficulties.

Generating local control over revenues at the margin by the local rate-setting authority is possible without the need to replicate tax administrations at each level of government. Yet, political economy concerns suggest that this may only be possible if the relevant administration is seen to be of arms' length and not amenable to suasion. International options in this regard are summarized in Figure 1, along with possible solutions. This may be useful for China and other countries, including *inter alia* Mexico, Pakistan, and Egypt, which may want to establish greater accountability at the local or municipal levels.

Again, a linkage between the property tax at the urban municipality level and the provision of services is shown to reduce incentives to evade tax (Ahmad, Brosio, and Pöschl 2014). The explicit connection is made in the case of the UK, which has one of the highest property tax collection rates in the OECD (see Figure 2).

In conclusion, the tax system should generate sufficient revenues over the medium-term. The rule of thumb would be to finance 30% of additional investment needs, or at least 1%–2% of GDP given existing levels of spending, but also create conditions for

- deepening structural change through
- meeting environmental concerns and
- investment in education and basic services;

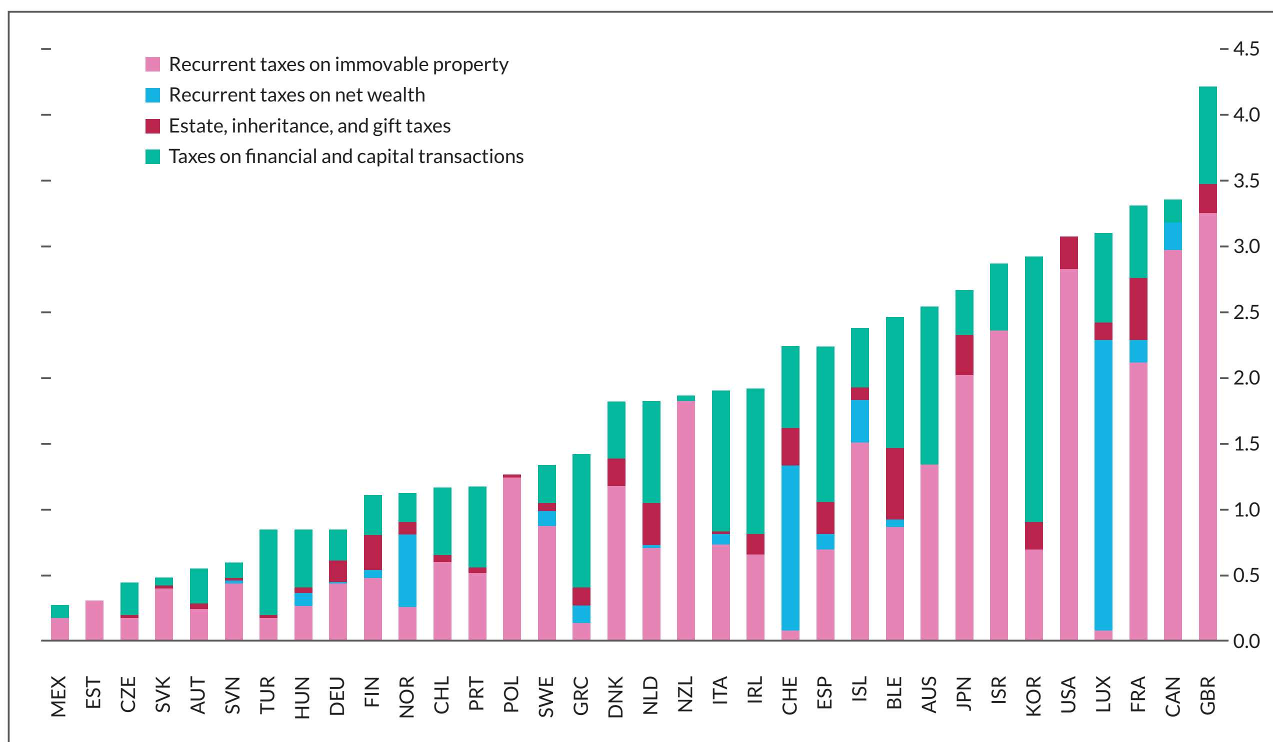
Figure 1. Typology for Local Taxation and Policy

		1a	1b	2a	2b	3a	3b
Key Factors	**Central Tax**	**Shared Taxes** Central Admin	Joint-Admin	**Own-revenue/Surcharge** Joint	Central	**Local Tax** Joint-Admin	Local Admin
Rate/base	CG	CG	CG	LG	LG	LG	LG
Revenue	CG	CG/LG	CG/LG	LG	LG	LG	LG
ADMIN							
Registration	CG	CG	CG	CG	CG	LG	LG
Valuation	CG	CG	CG	CG	CG	LG	LG
Assessment	CG	CG	CG	CG	CG	LG	LG
Bill Delivery	CG	CG	CG/LG	CG/LG	CG	LG	LG
Collection	CG	CG	CG	CG	CG	LG	LG
Enforcement	CG	CG	CG	CG	CG	LG	LG
Services	CG	CG	CG/LG	CG/LG	CG	LG	LG

Central Control → Local Autonomy

Source: Ahmad (2015).

Figure 2. OECD Property Tax Collections



Source: Organisation for Economic Co-operation and Development (OECD) Revenue Statistics.

- redistribution by generating resources for targeted transfers, together with redistributive income taxes;
- enhancing accountability—especially, although not exclusively, at the subnational level.

4. Governance and Accountability

In the context of limited resources, a critical element for ensuring sustainable investment is good governance and accountability on the spending side. The fundamental elements include transparency in the spending process, as

well as standardized and timely information on the sources and uses of funds.

The risk management issue is critical for ensuring that funds will be forthcoming for longer-term investments. Particularly, if investments are financed by other governments or SWFs, the intermediation of a reliable third-party or multilateral bank becomes critical. This reflects the need for assurance that neither firms implementing the projects or investments, nor contracting countries will renege on contracts when it suits them. The tax policy component of this process has been discussed above.

An increasingly important element in decisions to continue to allocate funds or tranches for investment relates to the achievement of the expected results. Again, the intermediation of an arms-length third party such as a multilateral bank would be very useful.

4.1. Information Flows and Intertemporal Management of Risks[5]

Clearly, poor information flows reduce local accountability, limit the operation of political constraints on non-performing jurisdictions, and facilitate gameplay vis-à-vis central or supranational/international agencies. The gameplay has been clearly highlighted in the case of the European Union (EU) and incentives for autonomous agencies as well as regional and local governments to "hide" information or "kick the can down the road." Limited information flows also facilitate rent seeking and diversion of resources.

Relatively few developing countries utilize the full format of the International Monetary Fund's (IMF's) Government Financial Statistics Manual (GFSM),[6] for both central as well as subnational governments. The format is designed to ensure conformity of the financial information with the System of National Accounts.[7] Multiple formats operating in Mexico at the federal level and across the states make it difficult to generate standardized information for general governance. This makes it problematic to ensure comparability across subnational entities or engender accountable competition across states. Brazilian states, while not conforming to the GFSM, perform better than Mexico as the federation requires a standardized format to receive and report on federal resources as well as their own resources. Mexico has now legislated standardized reporting on a GFSM-compatible basis and a common chart of accounts for subnational operations, but this will not be effective until 2014. Canada has no plans or ability to require provinces to conform to national or international standards.

The likelihood of "gameplay" by various levels of government or government agencies cannot be ruled out barring a complete and standardized format to categorize the cycle of revenues and expenses in conjunction with tracking cash flows. A typical problem is the inconsistent treatment of budget coverage—with the frequent exclusion of spending by government agencies or of liabilities parked in public enterprises.

As illustrated in Figure 3, a government's cash transactions are shown as set C. This is a subset of F, which also includes financial assets and liabilities. In turn, F can be denoted as a subset of R, which also includes all current assets and liabilities. It is relatively simple for governments to reduce deficits in cash (C) or financial assets (F) without affecting all recognized liabilities (R) or extended net worth based on future flows (E). For instance, (subnational or national) governments could engage in gameplay by

- Selling non-financial assets in R for cash in F;
- Assuming future pension liabilities in E for cash and financial assets in F;
- Securitization C of future revenue streams F (common in Latin American local governments);
- Treating borrowing F as revenue C (several US states).

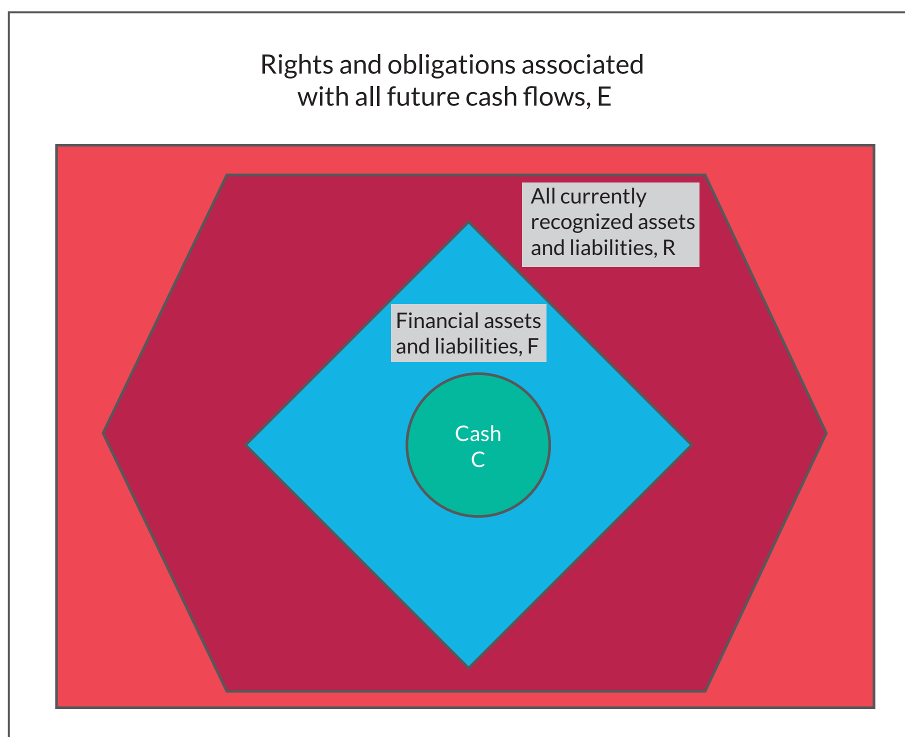
The sets C, F, and R are consistent with the IMF GFSM2001. These represent nested sets of information, and if presented in parallel with E, virtually remove the scope for gameplay by governments at any level.

Standardized information is critical for any serious implementation of fiscal rules in multilevel countries/currency unions. This should be based on the consistent and systematic generation of information in the overlapping manner described above.

There is a growing popularity of performance budgeting at the center (in both Latin American and Asian countries, including Mexico and Pakistan), as well as participatory budgeting at the local levels. Often, bilateral donors seeking to improve budgetary outcomes drive this tendency. Clearly, focusing on outcomes is a useful addition to a regular budget process, but it does not eliminate the need for a consistent, standardized, and timely flow of information so that electorates and policy makers are able to judge the true costs of their policy choices.

The importance of GFSM cannot be overstressed, not for reporting to the IMF, but for the efficient management of finances in multilevel countries and in common markets/currency unions. This has implications for the assistance that could be provided by international agencies to member countries—stressing the importance of a consistent chart of accounts for each subnational government consistent with GFSM. The more complete agenda for the generation of accurate, complete, and standardized information will have consequences for developing countries as well as for countries in the EU (such as Portugal and Spain) as they struggle to cope with the discovery of liabilities in the extended public sector as well as at the regional and subnational levels.

Figure 3. Schematic Illustration of Public Cash Flows and Financial Assets



Source: Ahmad (2015).

4.2. PPPs—Kicking the Can Down the Road?

PPPs have been encouraged, including by international finance agencies, as a means of leveraging private sector expertise for public investment projects, as well as a method to bypass bureaucratic bottlenecks. This is believed to generate efficiencies and improved value for money, especially at the subnational level. Additional growth is expected to result from the efficiencies and additional private finances that would be utilized.

The problem is that governments often consider PPPs as a means of circumventing budget constraints, although not exclusively at the subnational level. This could generate legal obfuscations, and relevant official agencies or governments are either not fully aware of the liabilities or of private partners' ability to meet them. Sometimes, the issue of liability for full costs is avoided, often with respect to public infrastructure (highways and hospitals in Europe); local governments only include the annual contractual cash payment in the budget and generally only during the tenure of the concerned local government. Often, there is no provisioning for the eventual reversion of the assets to the public sector. Furthermore, public interventions are usually ongoing with respect to prices or distribution.

There is also incomplete and asymmetric information, with costs and efforts for projects generally known only to the private partner and significant incentives for either the private contractor or the government to renege (Danau and Vinella 2012). An example of a growing recognition of limited commitment comes from the UK (which was in the forefront of the PPP revolution). In the 2002–2003 upgrading of the London Underground, Metronet (the contracting consortium) could not borrow the full amount of funds needed for the project. Consequently, Transport for London, the decentralized agency responsible, guaranteed 95% of Metronet's debt obligations. Metronet failed, and the UK government (Department of Transport) had to pay Transport for London a sum of £1.7 billion to enable it to meet the guarantee (House of Lords 2010). The direct cost to taxpayers was estimated to be as high as £410 million. Other examples from the UK, e.g., for wind farm projects, show that in these cases, the private contribution was financed by complex financial instruments that are tantamount to debt—that has eventually to be taken over by the state.

Due to the aforementioned difficulties, the International Accounting Standards Board (2011) has issued a new set of guidelines (IPSAS 32)[8] that force an upfront accounting for PPPs, and would significantly affect deficits and recognition of liabilities for general government—i.e., for both central and subcentral governments and related agencies. This ensures that the operator is effectively compensated for services rendered during the concession period. It requires the government or the granting public agency to recognize assets and liabilities in their financial statements, when the following conditions are met:

- The government or granting public agency controls or regulates the services to be provided, the target beneficiaries, or the price;

- If the grantor controls through ownership, beneficial entitlement, or otherwise, a significant residual interest in the asset at the end of the arrangement.

In the schema presented in Figure 3, this would involve elements in the areas R and E. This avoids the situation where neither the public or private partner recognizes the asset/liability at the end of the period. Indeed, as has been seen in Ireland and Spain recently (and with Mexican road in the early 1990s), even if there are no explicit guarantees by the federal or state governments and there is sufficient pressure on the banking system, it is likely that the state will assume a significant portion of the liabilities.

The implications are as follows:

- Annual budgets for each level of government must be cast in a medium-term framework;
- It is essential to undertake a full and careful evaluation of assets and liabilities and associated accounting and reporting of risks with a sufficiently long time horizon (using international standards such as the GFSM);
- It is always important to track the cash, and the design of national and subnational treasury single accounts (TSAs) becomes critical;
- In the context of possibility of the contractor or responsible government reneging on contracts, it is important that an impartial third party can serve as an arbiter in case of dispute.
- Consequently, if emerging market economies generate considerable cross-border investible funds, this provides a strong case for the establishment of a Brazil, Russia, India, and China, South Africa (BRICS) bank.

4.3. Following the Cash—TSAs and Transparency

A TSA is one the most important common features of budget systems across the world, whether of the “traditional” line item variety (as in most developing countries and Germany), or of the more modern flexible systems, that rely on spending agency accountability (as in Scandinavia). This institutional feature has been recommended by the IMF in a large number of countries. Despite some successes, as in China, establishing a TSA has proved elusive in many developing countries, ranging from Mexico (the only OECD country without a TSA) to Pakistan and Egypt.

The difficulty in establishing a TSA primarily lies in vested interests, both political and bureaucratic (for details, see Ahmad 2015). Often, spending occurs by security agencies, donors, and other political centers of power at the national level—and the key question is whether these can be included within the TSA.

The same issues arise with respect to donors or subnational entities. Should local governments have their own TSAs? Should they use a central TSA? What are the problems posed by donors, both multilateral (such as the World Bank) and bilateral that may not trust local governments to use their funds efficiently or without significant leakages?

Some countries do not have sufficiently large subnational entities for it to be efficient to establish local TSAs.[9] While local governments may use the central TSA in principle, the practice can pose a severe problem, for example, if local governments face a sudden closure of their bank accounts and do not know where the money goes or the status of their balances. Furthermore, they may have to send emissaries to the central Ministry of Finance to issue payment orders and petition the Treasury to release funds. This adds to the complexity of the local budget process and could endanger the decentralization process.

Some donors, in particular countries, insist on keeping separate bank accounts for their spending. This may partly reflect a lack of confidence in local processes, but poses the risk of establishing parallel budget processes. This also makes it difficult for either local or central governments to consolidate control over total spending. Besides obfuscating the budget process, it could reduce the accountability for achieving results. Solutions for monitoring cash flows at the national and subnational levels are developed by Ahmad (2015).

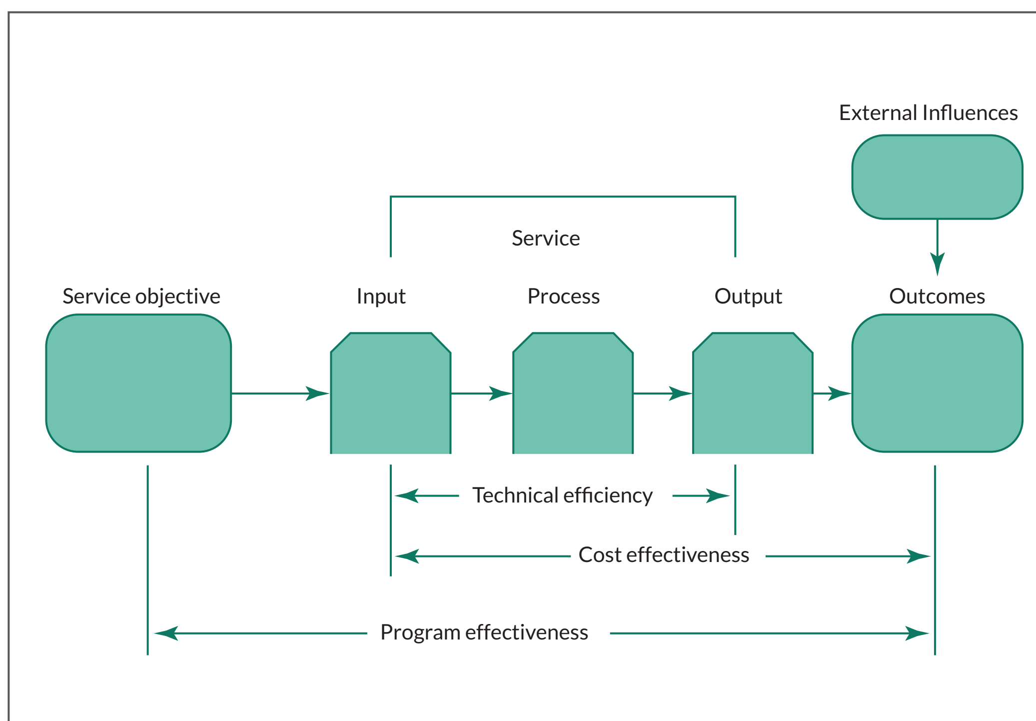
4.4. Linking Investment Transfers to Results?

Results-based intergovernmental transfers are expected to lead to positive infrastructure and service-delivery outcomes, with improved allocative efficiency, better implementation, and lower costs.10 Such grants have been increasingly stressed by the international agencies, including the Asian Development Bank (ADB) and the World Bank.

Performance-based transfers have to be carefully designed and managed, especially, if implemented in the sphere of subnational government competence. If inadequate attention is given to the factors that could be attributed to local government actions, such transfers could divert own resources to less productive activities as well as reduce accountability. The cycle from objectives to outcomes has to be carefully specified, and exogenous factors need to be considered (see Figure 4).

The technical efficiency component reflects the regular budget process that links the allocation of funds through to funds actually spent, as well as outcomes. These would be normally tracked with the help of a Government Financial Management Information System (GFMIS), preferably on a standardized basis for all subnational and central/federal governments. International agencies have assisted numerous countries, including South Asia and Latin America with subnational GFMISs, although with less attention given to a common chart of accounts that would generate information on a GFSM-compatible basis. In addition, a linkage has to be made between outcomes

Figure 4. Performance-Based Grants: Conceptual Framework



and the service objectives. A degree of subjectivity exists in determining the exogenous factors that might have influenced outcomes.

If performance-based transfers are based on complex input criteria or detailed standards that cannot be monitored or enforced, conditionality becomes irrelevant. Similarly, a focus on outputs rather than outcomes may lead to unintended or perverse incentives. Nonetheless, physical outcomes may be relatively simple to identify quickly and accurately even in situations where information on budget spending is partial or subject to delays—this could be particularly useful for infrastructure projects. These could be measured and additional funding in future rounds could be made conditional on these outcome indicators (Ahmad and Martinéz 2010). Care has to be taken to ensure that the positive incentives from a performance–based system are not negated by other badly designed transfers, for instance, those based on gap filling or other distortive criteria.

A performance-based system should supplement local government actions and responsibility, such as through meeting infrastructure gaps that is difficult for local governments to address and which can be easily monitored. In the long run, more effective and standardized public financial management (PFM) systems are essential for information flows to improve efficiency and accountability. Similarly, incentive structures depend on whether subnational entities have access to own-source revenues and are subject to hard budget constraints. While implementation of this mutual interdependency will take many years, developing countries could introduce simple performance-based grants in specific sectors or discrete areas that will improve outcomes.

5. Conclusions

A longer-term agenda for sustainable growth will require the judicious use of private resources, national as well as cross border. However, this will require concomitant public actions, especially in education and health care, as well as basic infrastructure that is unlikely to be provided by the private sector. Consequently, there is a need to focus on an overall envelope within a medium-term perspective:

- An enhanced revenue envelope, including own-source revenues at the subnational level, will be needed to finance public spending especially for infrastructure gaps;
- Both public and private decision making requires full information on how monies are raised and spent, and the buildup of liabilities needs to be recognized, with accountability at the appropriate levels of government;
- Special provisions and preferences that create "holes" in information flows and shelters for rent seeking should be avoided as far as possible to create a level playing field for investment and growth;
- Institutions have to be context specific, but
- More work is needed in most developing countries (and several developed countries as well) on the generation of information on assets and liabilities;
- Incentives for better governance (including sub-national own-source revenues) are critical.

While there is considerable promise in focusing on cities as hubs for sustainable growth, design and implementation problems are accentuated at the subnational level. Political economy constraints involving the sharing of resources and accountability are heightened.

Given the domestic fiscal agenda, there is a clear case for additional risk mitigation by third-party international agencies. Further sectoral detail is provided in the study by Ahmad et al. (2015), which includes a case for more active participation by the existing multilateral banks and a possible BRICS Bank.

Endnotes

[1] This paper draws on Ahmad (2015). Helpful comments from Amar Bhattacharya, Homi Kharas, and Mattia Romani are gratefully acknowledged as well as comments received at a G-24 seminar in Luxor and at the UN Committee on Sustainable Development. A companion paper on Information and Incentive Structures can be found in the study by Ahmad et al. (2015).

[2] This is true with a consumption-type VAT where VAT paid on investment and capital purchases is credited against VAT due on sales. However, with an investment-type VAT (such as that in place in China during 1994–2008), investment credits are not allowed. This can theoretically have a dampening effect on investment and trade. However, revenue considerations may be more important to finance infrastructure, as was the case in China in the mid-1990s, without an adverse impact on overall growth, although the move to a more neutral consumption-type VAT was eventually achieved. Removing investment distortions has become important as real wages have risen and the exchange rate has appreciated. However, extending VAT to services on a sector-by-sector basis is proving difficult.

[3] Although there is no harmonization requirement for the CIT within the EU, multinational companies, such as Starbucks, could use the very low Irish CIT rate to avoid paying the still low UK rate of 25%, has caused a public outrage recently, forcing a tightening of administrative procedures.

[4] A contrasting view is held by Keen (2012) who argues that the more important issue relates to “hard to tax sectors” rather than incentives to “informality”.

[5] This section draws on Ahmad 2015 and 2013.

[6] The last major update was in 2001, although smaller adjustments have been made in keeping with the changes in the System of National Accounts.

[7] Several countries use transition matrices for reporting central or general government information to the IMF in the GFSM format. Pakistan, for example, reported data only for the budgetary central government in the latest issue of the GFSM. This is inadequate, as much of the social spending occurs at the subnational level. As seen in Ahmad et al. (2015), even OECD countries do not conform to the standards—and this may be a factor in the current crisis.

[8] See IASB (2011), IPSAS 32. This standard is also likely to affect the guidelines of Euro stat, which are not so tightly defined.

[9] Chinese provinces are larger than most countries and have their own TSAs, nested and linked with the Central TSA in Beijing. This is a very interesting model and could usefully be examined in the larger multi-level countries—e.g., other members of the BRICS and countries of similar size, such as Indonesia or Pakistan.

[10] UNCDF (2010). “Performance-based Grant Systems: Concept and International Experience.”

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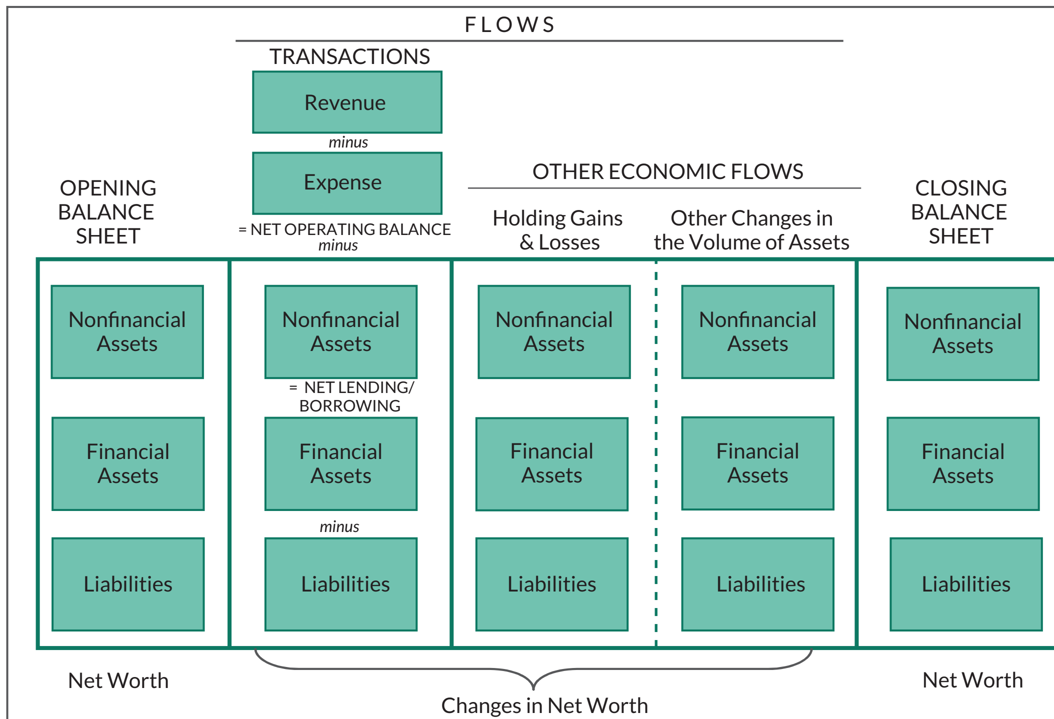
Annex 1. Structure of the GFSM Information System



Source: GFSM 2001 IMF

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