

# The role of public investment in social and economic development

## Public Investment:

Vital for Growth and Renewal, but should it be a Countercyclical Instrument?



United Nations  
New York and Geneva, 2009

## **Preface**

This document serves as background paper for the High-Level Seminar on the Role of Public Investment in Social and Economic Development, 13–14 July 2009 in Rio de Janeiro, Brazil. The seminar was organized by UNCTAD and the Brazilian government in response to a request by the President of Brazil, H.E. Mr. Luiz Inácio Lula da Silva, made on the occasion of the Twelfth Ministerial Session of the United Nations Conference on Trade and Development, held in Accra in April 2008.

The background paper was prepared by the Centennial Group, a strategic advisory firm based in Washington, DC, for UNCTAD under the direction of James Zhan, Director of the UNCTAD Division on Investment and Enterprise (DIAE). Guidance and backstopping were also provided by Joerg Weber and Mike Pfister.

*Geneva, July 2009*

## Contents

Preface.....	2
I. What is the role of public investment? .....	4
Defining public investment .....	4
The pay-off from public investment.....	6
Criteria for public investment .....	10
Recognizing the policy trade-offs with other public programmes.....	11
II. Meeting the challenge of public investment financing.....	12
The “Golden Rule”: is it sufficient to ensure adequate investment spending? .....	13
Public investment by subnational governments.....	15
Institutional approaches to strengthen the public investment decision process.....	16
Drawing in the private sector through public–private partnerships.....	17
China and India: sources of infrastructure financing .....	20
III. Challenges in using public investment as a countercyclical policy instrument.....	22
IV. Concluding thoughts .....	26

## Tables

Table 1. Estimated requirements for Infrastructure spending in coming years.....	9
--	---

## Boxes

Box 1. United States: components of the American Recovery and Reinvestment Act of 2009 (in billions of dollars).....	23
Box 2. Characteristics of public infrastructural investments observed in recent fiscal stimulus packages .....	24

## **Public Investment: Vital for Growth and Renewal, but Should it be a Countercyclical Weapon?**

The last decade has seen a resurgence of attention paid to the role of public investment. Whether because of the desire to learn from the investment-fueled high growth in Asia, respond to the expected rapid pace of urbanization and its associated infrastructure needs, take advantage of technological change in telecommunications and energy or reduce a country's carbon footprint, governments at all levels of development have recognized the need to bolster public investment levels. This attention has engendered efforts to find the necessary budgetary resources, and where this has proven infeasible, led to innovative approaches for collaborating with the private sector, particularly in the financing and implementation of public infrastructure investments. The recent financial crisis has further intensified the focus on public investment as a potential countercyclical policy tool, both to create jobs and lay the foundation for renewed and sustained growth.

This paper will emphasize the important role that public investment can play in coming years for realizing government policy goals for growth, poverty reduction and climate change mitigation as well as for responding to forthcoming demographic trends, particularly intensified urbanization. It will underscore the financing challenge posed by budgetary constraints and the need for continued efforts to develop fair risk-sharing mechanisms that foster collaboration on infrastructure investments with the private sector while still limiting the government's contingent financial risk exposure. It will explore both the potential and the limitations of public investment as a countercyclical fiscal policy tool in the current crisis. The

paper will conclude by laying out several issues for discussion.

### **I. What is the role of public investment?**

#### **Defining public investment**

What types of expenditure can be characterized as public investment? This is less obvious than might appear at first glance. In principle, the normal distinction between capital and current outlays would apply, with the former relating to any expenditure whose productive life extends into the future. Thus, much public investment takes the form of infrastructural outlays – for road and rail networks, ports, bridges, energy-generating plants, telecommunications structures, water and sanitation networks, government buildings – which can have a productive life of several decades. Such outlays range from small, one-off, limited infrastructural projects that can be implemented within a year to more complex projects that take place over decades – so-called “mega projects” (the Boston “Big Dig”, the Netherlands’ dike schemes, Heathrow Terminal 5, the Chunnel, etc.). As in the private sector, governments may invest in machinery and equipment – computers, laboratory equipment, even textbooks – whose life span is much shorter.

But other types of outlays, some of a more current form, can also contribute to capital formation. Notably, government spending on education and health contributes not only to an individual's human capital but also to that of society, with benefits that can extend for a lifetime. Here the capital good is less tangible than a building or a piece of

equipment. While governments traditionally classify spending on education and health as current expenditure (and thus not a form of public investment), the policy implications of this treatment are often contentious, particularly when governments seek to justify borrowing only for public investment. Equally tricky is whether to include spending on maintenance in the definition of public investment. While governments often treat maintenance as a form of current outlay, periodic maintenance and rehabilitation projects should be treated as capital outlays, since the absence of maintenance can reduce the productive life of an infrastructural asset, often substantially.<sup>1</sup>

While any capital outlay of a government would be defined as “public investment” in normal budgetary classification terms, this approach sidesteps a number of important conceptual issues. First, from a normative public finance perspective, the reason that governments spend on public assets is because some form of market failure is present that either leads to inefficient provision by the private sector or entails excess rents to a private producer. Specifically, the asset gives off externalities, positive or negative, or the asset is a “public good”, whose services are subject to “non-rivalness” in consumption or where it is difficult to exclude potential consumers. Or there are economies of scale involved, such that a natural monopoly situation would be entailed, justifying either public provision or regulation of a private monopoly. Many kinds of infrastructural networks are subject to such natural monopoly conditions.

Moreover, the public sector’s role in public investment is not limited to its own

---

<sup>1</sup> The distinction is typically made as between routine, periodic and rehabilitation maintenance, with routine maintenance intended to ensure the smooth functioning of the asset during the course of a year, periodic maintenance as critical in preventing premature deterioration of the asset and rehabilitation maintenance being even more critical to ensure the design life of an asset. Often, one refers to “O&M” (operations and maintenance) where operational outlays refer to the complementary current outlays for wages and other materials necessary to realize the output potential of a capital good.

budgetary spending. A simple focus on government outlays may yield too narrow a picture of the level of public investments and more importantly, an overly restricted perspective on the potential role played by governments with regard to the provision of public infrastructure. Most obviously, when the government collaborates in a public–private partnership (PPP), most outlays will normally be made by private sector entities. Yet the purpose of these outlays would be to provide goods or services for which there is justified public involvement. And the government’s role in relation to the PPP arrangement – in terms of monitoring, regulation, risk bearing and ultimately purchaser of the asset (long in the future perhaps, but part of the PPP contractual terms) – will still remain prominent. Similarly, in cases where the private sector invests in the production of goods characterized by natural monopoly conditions, government regulatory involvement is called for. In other spheres of private investment, a government regulatory or planning role may also be fundamental in order to take account of public policy objectives (in the case of externalities), though such investments would still be recognized as private.

The challenge of classifying public investment is rendered even more complex in the context of privatization efforts, where the sale of a government asset is classified, in budgetary terms, as a “negative investment”, though in fact the transaction simply represents a reclassification of ownership.<sup>2</sup> The complexities of measuring public investment and the changes in the definitions that have occurred over time has led the Organization for Economic Cooperation and Development (OECD), in

---

<sup>2</sup> This raises the further issue that government budgetary accounts or balance sheets rarely measure the extent of depreciation of the public capital stock. As a result, one can have a negative investment arising from privatization, but no measure of the decline in capital arising from depreciation. Such accounting practices contribute to the undervaluation of spending on periodic and rehabilitative maintenance, which would reduce the extent of depreciation of the public capital stock if it were so measured.

its recent effort to analyze the linkage between public investment and growth, to rely on indicators of physical stock rather than measures of the financial value of public investment or the net value of its capital stock. Rather than being misled by a narrow budgetary classification, what is important to recognize are the ways in which governments have a responsibility in the creation of capital goods and their need to intervene, particularly when market failure leads to underspending on goods vital for the realization of public policy objectives.

### **The pay-off from public investment**

There is a curious disjuncture between the econometrics literature that seeks to measure the quantitative impact of public investment on growth and the large policy and planning literature that estimates the size of infrastructural gaps and the amount of public investment needed in different sectors within the foreseeable future. While the former provides a somewhat ambiguous message on the impact of public investment on growth, there is little ambiguity in the picture painted by the latter on the need for a dramatic increase in infrastructure to close existing gaps in service provision (particularly in low income countries) and to deal with the multiple policy challenges of the future.

After years of quiescence, the debate on the impact of public infrastructure investment on growth was reinvigorated by Aschauer (1989), who used econometrics to support the productivity of non-military public capital investments in the United States. Indeed he explained the post-1970 decline in United States productivity growth as a consequence of the decline in public investment. Gramlich, in a 1994 survey article, noted that the subsequent blizzard of papers on the topic failed to yield conclusive results confirming Aschauer's results. But this did not quell interest either in the role of public investment or in the challenge of empirically assessing its impact. By the late

1990s, the strong growth of Asian economies coupled with their high public investment rates led to a debate in Latin America as to whether its relatively lower investment rate could explain its weaker growth performance.

What does the econometrics literature now say? Drawing on recent surveys of the literature (e.g. IMF, 2004; Scandizzo and Sanguinetti, 2009), the evidence seems to be mixed on the impact of aggregate public investment rates – broadly defined – on growth, with some studies finding little relationship between public investment rates and per capita gross domestic product (GDP) growth. This is not surprising for a number of reasons. An important part of public investment outlays support the broad functions of government (provision of social services, redistribution, maintenance of law and order, administration), which only indirectly feed into the factors influencing productivity growth. Much public investment is of a “lumpy” nature, focused on infrastructure that has its impact on productivity only over a long period of time. Moreover, as already noted, the data on public investment has numerous deficiencies, excluding the contribution of spending on education and health, and overstating the level of investment (by virtue of ignoring any measure of the depreciation of public capital).

Yet when the focus is more narrowly placed on infrastructure investments or on indicators of the stock of infrastructure assets, the evidence becomes more nuanced. Calderón and Servén (2004), in a World Bank study, found significant positive contributions from public investments in telecommunications, transport and power, with the estimated marginal productivity of these assets significantly exceeding that of non-infrastructural capital. In a similar vein, Calderón et al. (2003) suggest that cutbacks in infrastructure spending reduced long-term growth by about 3 percentage points a year in Argentina, the Plurinational State of

Bolivia and Brazil and by 1½–2 percentage points a year in Chile, Mexico and Peru.

Sutherland et al. (2009), in a study on network infrastructure investments in the OECD, sought to gauge whether infrastructural investment has an effect on output “over and above those from simply adding to the productive capital stock”. They note that:

infrastructure can have additional effects through a number of different channels, such as by facilitating the division of labor, competition in markets, the diffusion of technology and the adoption of new organizational practices or through providing access to larger markets, new resources and intermediate products. (p. 13)

Their cross-sectional estimates suggest significant non-linearities, with the relationship between infrastructure and growth changing with the level of infrastructure. Initial investments exhibit only small marginal effects on growth, but more substantial positive effects are observed when an infrastructural network is elaborated in a sector. However beyond that, subsequent investments that only add to a network tend to have a smaller additional pay-off in terms of growth. Indeed, for some countries, investments even had a negative effect.<sup>3</sup> The energy and telecommunications sectors particularly exhibit these non-linear effects. But Sutherland et al. also emphasize that these results are by no means universal, with both

---

<sup>3</sup> To give a sense of the differences, for electricity generation, the effects are significantly positive for most countries, but for Australia, Ireland, New Zealand and Republic of Korea, there is evidence of negative spillovers from additional investment. For roads, positive coefficients are found for New Zealand and the United Kingdom but negative ones for France, Greece, Netherlands and Spain. For telecommunications, additional fixed mainline investment would have negative externalities for Australia, Iceland, New Zealand and the United Kingdom and positive ones in Austria, Greece, Italy, Mexico, Norway and Spain, but these coefficients are reversed when an alternative measure of infrastructure (total subscriptions, including mobile telecommunications) is used.

positive and negative effects found in different countries, reflecting principally the pre-existing level of infrastructural availability. This implies that while infrastructural investment may have been profitable in the past for these OECD countries, future new investments may not be as profitable. But equally valid, for countries where there are substantial gaps in infrastructure, there are considerable returns that can be anticipated from the elaboration of an infrastructural network.

Other recent studies – by Scandizzo and Sanguinetti (2009) as well as Roland-Hurst (2006) – also emphasize the positive impact on trade flows from public infrastructural investments in transport, airports and port facilities. By reducing trade and transport margins and lowering the cost of market participation in a relatively non-discriminatory manner, infrastructural investments can promote regional trade expansion. They underscore that these effects on transport cost margins have become particularly important as countries have sought to reduce tariff and non-tariff barriers. This type of effect is only one of a broader set of ways in which public infrastructural investments can create synergies with private investments. By providing key infrastructure, private investments that were previously uneconomic become profitable, as energy and water availability are no longer characterized by shortages, communication channels are raised to global standards and transport time becomes comparable to competitor countries. In terms of attracting foreign investments, infrastructure narrows the set of issues that deter consideration of a country as a potential market for investment.

Scandizzo and Sanguinetti also underscore another important effect of public infrastructural investment, namely its impact on the quality of life of households, particularly in low income and emerging market countries. Provision of water and sanitation services for underserved

communities positively affects the health and time availability of households. Provision of electricity has multiple potential positive effects – access to information, the possibility of heating water and keeping food cold and extending the number of hours “dedicated to productive activities”. Better roads enable households to access potential jobs, education and health services more efficiently.

In a recent paper, Ter-Minassian et al. (2008) emphasize the mediating contextual factors that appear to explain why the empirical literature finds the impact of public infrastructural investments positive in some countries and negative in others. These include: (a) how the investment is financed, specifically whether the government’s mode of financing ends up crowding out private investment; (b) the availability of complementary inputs, in particular the quality of human capital (citing studies that suggest that infrastructure investment has its largest impact when “combined with other forms of ‘productive’ public expenditure, such as effective education and health spending” (p. 6.)); (c) the quality of project evaluation, selection and management, the absence of which can significantly lower the cost-effectiveness of infrastructure projects; and (d) the “regulatory and operational framework within which such infrastructural services are provided”. This last point is echoed by Sutherland et al, who emphasize the importance of the policy framework within a country, in terms of whether it “encourage[s] an efficient level, allocation and quality of infrastructure investment” (p. 18). This includes the approach to assessing the social profitability of an investment, the regulatory framework and the incentives it provides for competition within a sector and the balance between public and private investments in public infrastructure.

Looking to the future, the evidence on the need for public infrastructure investment appears almost overwhelming. Indicators of infrastructure availability in many countries

reveal obvious and enormous gaps. They highlight the number of households without access to clean water and basic sanitation services, the number of days when shortages in electricity or water are present, the frequency of intense road congestion, the excessive time required to bring goods to port or to unload them and the inadequacy of a country’s per capita electrical generating capacity. Others reveal the sharp differences in infrastructure availability between urban and rural areas or the increasing logistical costs experienced by enterprises.

Even more compelling, consideration of demographic trends as well as obvious long-run policy challenges on the agenda of many governments underscore the need to go beyond simply closing existing infrastructural gaps. Recent United Nations projections highlight the dramatic urbanization that will occur in the next several decades, particularly in Asia and Africa (United Nations, 2007). In Asia alone, there will be 500 million new entrants to urban areas in the next 20 years. This will necessitate substantial investments in public infrastructure, both to provide basic universal services (water, sanitation, roads and power) as well as the infrastructure necessary to facilitate and incentivize private sector investments for job creation (Heller, 2009).

Pressures to address climate change mitigation, adapt to ongoing climate change developments (particularly sea level rise and changing precipitation patterns) and transform the energy generation sector with technologies that reduce carbon emissions will all require substantial investments in new infrastructure. Reduced water availability will necessitate investments to harness potential water sources, both to respond to demands in growing urban areas and to service industry and agriculture. Emerging innovative technologies will undoubtedly require new investments if they are to be adopted. And last, but not least, to realize the Millennium Development Goals,

governments will need to invest to close existing gaps and respond to the additional demands of a rising population, particularly in Asia and sub-Saharan Africa.

The implied requirements for public investment are large and can be illustrated by the forecasts of, inter alia, the Asian Development Bank (ADB), the New Partnership for Africa (NEPAD), OECD and the World Bank as well as concerned non-governmental organizations (NGOs) (table 1). Focusing just on industrial countries and

some of the larger emerging market countries, the OECD estimates that investments of almost \$3 trillion per year will be needed in five sectors. The ADB estimates that Asia alone will need almost \$1 trillion in annual investments over the next decade. Yet most studies suggest that current investment spending is barely half the amount required, and that on their own, neither governments nor the private sector can finance the required essential investments in infrastructure (Kuroda et al., 2006).

**Table 1. Estimated requirements for infrastructure spending in coming years**

Asian Development Bank (Kuroda et al., 2006)	
East Asia	\$700 billion per year for the next 10 years
South Asia	\$88 billion per year for the next 10 years
European Union: Western Europe: transport (Gil and Beckman, 2009)	\$600 billion between now and 2020 for transport
Estache (2006): Africa	\$40 billion annually for investment and operations and maintenance
NEPAD (2002)	\$64 billion annually
OECD (2007): estimates for OECD countries and some larger developing countries (such as Brazil, China and India)	\$70 trillion between 2005–2007 and 2030 for surface transportation (roads, rail and urban public transport), water, telecommunications, electricity transmission, distribution and generation and other energy-related infrastructure
World Water Council (Gil and Beckman, 2009)	Developing and transitional countries will require \$80 billion annually to produce water security in the next 25 years
International Energy Agency (Gil and Beckman, 2009)	\$20.7 trillion would be required today if all governments simultaneously decided to enact over 1,400 policies to secure energy supplies due to decades of underinvestment in energy infrastructure
<i>Economist</i> (2008)	\$22 trillion in projected investments over the next 10 years in emerging economies.

There are three important takeaways from this discussion. First, public investments can have an important positive impact on growth, trade and household welfare. Second, the need for high quality public investment is overwhelming as one

confronts existing infrastructural gaps and future policy challenges. But third, and not less important, there is ample evidence that the returns from such investments are not always as high as desired and that there is a considerable pay-off to having an

appropriate policy framework to ensure adequate productivity. In part, the rate of return may simply relate to whether an investment breaks new ground in the creation of an infrastructural network or merely adds marginally to an existing network. More important factors for emerging market and low income countries include whether the financing modalities for public investments are compatible with fostering private sector investment as well as ensuring macroeconomic stability; whether the public sector is able to effectively evaluate, implement and manage its public capital stock; whether there is provision of critical complementary public services (particularly in education and health); and whether the government is fostering good and transparent governance and the rule of law.

One final point not raised heretofore must also be mentioned. The need for public investment will occur at all levels of government. Much of the needed investment, particularly for infrastructure, relates to priorities that must be addressed at the municipal or regional levels. For many countries with a fiscal federal structure, local, municipal, state or provincial authorities must thus address the challenges of financing and management.

### **Criteria for public investment**

With fiscal constraints binding and the desirability of private sector financing nonetheless tempered by the need for caution on the amount of risk ultimately borne by government, sound criteria are needed for appraising the profitability of public investments. This is not a new problem. For almost a half-century, the art and techniques of social cost-benefit and cost-effectiveness analysis have become highly developed and well understood (see (Little and Mirrlees, 1974; Belli et al., 1998). Too often, the problem observed is a lack of capacity by governments to undertake such assessments and the difficulties of

developing reasonable measures of social benefits and costs of the social discount rate.

The complexities of analysis have been further increased by three important developments. First, while cost-benefit techniques are well suited for small discrete projects, they may be inadequate for large infrastructural projects with network characteristics or for mega projects, whose implementation may span many years. Mega projects in particular require more elaborate analysis, with “investments in front-end strategizing to reduce uncertainty, including risk management, scope and task definition, and contingency planning” (Gil and Beckman (2009), p. 19). Second, the use of PPPs requires additional dimensions of analysis in order to assess the locus of risk-bearing in the contractual arrangement for the various types of risks to which a project is exposed. Third, cost-benefit analyses focus on the net present value of the output derived from a project. But governments typically have other objectives – poverty reduction or social inclusion, enhanced energy efficiency, reduced carbon emission, fostering environmental sustainability, gender promotion, industrial upgrading, moving to a new level of technological sophistication, spurring entrepreneurship – and these benefits are less easily quantified, including using a cost-benefit approach.

These complexities have led to the elaboration of additional methods for assessing the viability and value of large investment projects. One involves determining whether an investment can remove critical bottlenecks in an infrastructural network. For mega projects, Flyvbjerg et al. (2009) suggest further analytical strategies. One involves the construction of alternative possible scenarios that a project might experience in terms of economic, environmental, demographic or technological developments. These could be contrasted

with the counterfactual situation in which the project is not undertaken.

Another encourages the use of an “outside” view of the problem, with a focus less on the specific details of the project at hand and more on a “broad reference class of similar projects”. The objective is to get an independent perspective on what is realistic in terms of the time frame for the project, its cost and its potential productivity.<sup>4</sup> Such a view can abstract from the “biases” or “predispositions” that inevitably are associated with a specific project, where there is an inevitable tendency to see each project as “unique”. They also suggest that in the course of any cost–benefit analysis, an “optimism bias uplift” should be incorporated. This constitutes an “empirically based adjustment to a project’s costs for different percentiles of cost overruns, on the basis of the project type” (p. 183). Finally, they argue for the establishment of a “risk register” that would list the risks likely to affect the delivery and operation of the proposed infrastructure and would clarify “who owns the identified risk”.

Particular care is also needed with regard to basic project design for mega projects. For these larger projects, since they will be implemented over time, there is a high possibility that unexpected needs as well as unanticipated technological change may occur. These would have to be incorporated in the design as the projects are implemented. This implies the need for flexibility in infrastructure design with upfront provision or allowance for some evolution in response to external changes.

---

<sup>4</sup> Flyvbjerg et al. (2009) provide a useful discussion of the reasons project assessments for mega projects often prove highly optimistic. They note that a characteristic of mega projects is that “managers pursue initiatives that are unlikely to come in on budget or on time, or to ever deliver the expected returns. These biases are often the result of the inside view in forecasting: decision makers have a strong tendency to consider problems as unique and thus focus on the particulars of the case at hand when generating solutions” (pp. 172–173).

Together, the challenge of these complexities underscores the importance to be attached to establishing dedicated institutional units for project analysis and assessment and network design and management. At the centre, linked to the Ministry of Finance, there is a need for a dedicated agency responsible for developing guidelines for project evaluation and assessment that can be applied to any project above a given size. This agency would also play a pivotal role in providing guidance to central budget authorities as to whether sectoral project proposals meet certain threshold criteria in terms of the standards for assessment and of social profitability. It would be desirable to establish similar units at the sectoral and municipal and state government levels. These units should be expected to assess and judge projects according to the nationally set technical guidelines. As we will discuss in section II, when a project is to be undertaken in the context of a PPP, additional guidelines and assessments would be needed to ensure not only the desirability of the project but also to transparently guarantee disclosure of the extent of risk transfer to the central government. Particularly if a regional or municipal project entails significant borrowing, there may be a role for the central government to review the project appraisal (recognizing that the central government’s involvement would be principally shaped by the particulars of the fiscal federal relationships of a country and the degree of autonomy provided to local governments in accessing funds from capital markets).

### **Recognizing the policy trade-offs with other public programmes**

A final concern when considering the appropriate amount of government investment is to avoid the implicit bias that may arise against spending on forms of public investment that are more oriented towards human capital. Social profitability

assessments of investments in human capital, particularly in education and health, are far more difficult than for physical capital projects. The pay-off in growth is likely to be much further into the future and the various benefits of these programmes are less easily captured in simple quantitative terms.

The difficulties in the trade-off between spending on human and physical capital emerges clearly in some low income countries, where the needs in both spheres are enormous. For low income countries, the gains from investment in primary education are well understood from many studies. Equally, lack of investments in primary health care may preclude achieving the decline in infant and maternal mortality rates necessary to create incentives for households to opt for a smaller family size and thus foster a demographic transition. As an example, Ethiopia desperately needs more physical infrastructure to harness its water resources, develop its road network, provide clean water and sanitation and provide even minimal electricity or telecommunications services to its rural population. But its social indicators in the spheres of education and health are very low (pupil-teacher ratios exceeding 100; population to physician ratios of 50,000) and there would be a high social and economic pay-off to investment in these sectors.

But even in some emerging market countries, a failure to invest sufficiently and well in human capital – particularly in the tertiary education sector – can create important bottlenecks that can prevent a country from sustaining a rapid growth rate. Taking India as an example, many policy analysts have expressed concern that there is insufficient capacity at the higher education level to enable a breakthrough in other sectors outside the leading edge technology sector.

This is not an argument for putting an unambiguous premium on investments in the social sector, e.g. for the realization of the Millennium Development Goals, at the

expense of reduced infrastructural spending. The opportunity cost of foregoing spending on infrastructure can be quite high and may deter private capital investments and retard the economic growth so essential for realizing increased employment and income growth among the poorest groups. The important point to make is that policymakers certainly need to be sufficiently sensitized to the fact that physical and human capital investments both have important pay-offs. Simplistic adherence to budgetary rules (as discussed below) or pressures for infrastructure investment should not undercut essential spending in the social sectors that can meet important human needs and contribute to sustainable long-run growth.

## **II. Meeting the challenge of public investment financing**

Virtually all governments – in industrial, emerging market and low income countries – face the challenge of finding the “fiscal space” (the available budgetary resources) to finance needed public investments (Heller, 2005). The obvious sources of fiscal space – raising taxes, cutbacks in unproductive or lower priority expenditures, user charges, privatization revenues and domestic borrowing – should be exploited as a government seeks to raise its investment ratio. This paper will not explore the various issues associated with the mobilization of fiscal space for public investment through the former two channels. The remaining sources of fiscal space will be touched upon in the course of this section.

In general, rare is the government whose budgetary position is strong enough to finance its public investment needs from tax and non-tax revenue sources without borrowing. Since most capital projects are long-lived and benefit future generations as well as the present, there is a sound economic basis for governments to finance

a substantial portion of their investment programme in this way. But there are obvious limits. Incurring debt to finance infrastructure investment is reasonable for the private sector, which expects to directly receive the benefits from investments in the form of a future stream of income or value. In contrast, governments invest on the basis of social profitability criteria to achieve many other non-monetary benefits and cannot count on these benefits being translated into higher tax receipts sufficient to cover the cost of a project's debt service or associated operations and maintenance.

Even when projects have a high pay-off in increased output, in low income and emerging market economies, poor tax compliance and limited tax handles may prevent a government from generating the revenues needed to pay for it. This implies that governments need to be sensitive as to whether their overall fiscal position, and in particular their debt levels, can be sustainably financed over the long term. Particularly for emerging market countries that borrow on global capital markets, allowing the government's debt to GDP ratio to rise above 40–50 per cent is likely to raise a red flag with creditors and potentially lead to an increase in the sovereign risk premium attached to government borrowing. Low income countries of course may benefit from aid flows in the form of grants and conditional lending, enabling them to run overall budget deficits (exclusive of grants) to finance significant public investments. But debt sustainability concerns apply even more strongly in these countries (recognizing that the criteria for assessing sustainability in these countries needs to take account of the degree of concessionality in the terms of government's debt). And even low income countries with large amounts of aid need to worry about fiscal sustainability, since a high rate of public investments will ultimately require funding for future operations and maintenance outlays.

Confronted with the fiscal space challenge, several policy questions will be discussed below. First, what budgetary rules or criteria should guide decisions on the appropriate size of the overall investment budget? Second, how should central governments ensure that subnational governments are fiscally responsible in financing their investment programmes? Third, what are the necessary institutional correlates associated with relying on such budgetary rules, and can we identify “best practices” among countries that are worth consideration by other countries? Fourth, what policy issues should be considered in relying on the private sector to finance public investment spending? Finally, are there lessons for other low income and emerging market countries that can be learned from China's strategy for financing its high level of public investment?

### **The “Golden Rule”: is it sufficient to ensure adequate investment spending?**

One approach to budgeting for investment is to pursue the so-called “Golden Rule,” which ensures that government borrowing is only for investment purposes and that current expenditures do not exceed current revenues. A government's capital outlays would then be financed by any surplus on the budgetary current account – i.e. government savings – as well as from public debt. Implicit in the Golden Rule is the recognition that public investments create assets and thus should not be treated the same as consumption outlays. In effect, using the Golden Rule ensures that any increase in debt on the public sector's balance sheet is at least matched by an increase in assets.<sup>5</sup>

Four concerns are often expressed about the Golden Rule as an approach to fostering public investment and maintaining fiscal and

---

<sup>5</sup> Some recognition would also need to be paid to ensuring that the increase in debt does not significantly exceed the net increase in public assets, after taking account of depreciation in the public sector's stock of assets.

debt sustainability. First, the rule itself does not offer guidance as to how much borrowing for investment is appropriate and consistent with macroeconomic stability and debt sustainability. Thus, in the United Kingdom at least, the Golden Rule has been supplemented by the “Sustainable Investment Rule” or “Debt Rule”, which sets a limit on the ratio of outstanding public debt to GDP in order to ensure continued fiscal sustainability. More generally, the literature on debt sustainability suggests that the appropriate ceiling for public debt would need to take account of the expected real interest rate, real growth rate and the absorptive capacity of the domestic capital market and risk perceptions of external creditors. Ultimately then, it is the latter rule that provides the binding ceiling on the amount of public investment to be implemented in any given period.

But some critics (particularly the International Monetary Fund – IMF) worry that the Sustainable Investment Rule corollary to the Golden Rule will receive inadequate attention or will be fudged in its application, creating potential pressures on fiscal or debt sustainability.<sup>6</sup> The problem arises because when an economy is buoyant, there may be a tendency to accept a high investment rate financed by debt, with relaxed standards concerning the assessment of investment decisions. The potential is then for a government to allow its debt ratio to increase to levels which prove vulnerable in an economic downturn. Thus, the Golden Rule may contribute to volatility in capital investment spending rates. Ironically, this issue may now be arising in the wake of the significant debt relief efforts for highly indebted poor countries at the beginning of this decade, which reduced their public debt ratios to relatively low levels. Since the sustainability rule is not likely to be a constraint on

borrowing at low debt ratios, one can readily understand that the combination of pressures for increased public investment and low debt levels would encourage borrowing for investment. This accentuates the importance of undertaking adequate assessments as to the social profitability of public investments.

Second, by itself, the Golden Rule does not ensure that borrowing will only finance projects with an adequate social and economic rate of return. Certainly in the past in many countries, decisions on public investment have been made in a non-transparent way and the institutional capacity for sound project assessment has proven lacking. Political pressures and creative accounting have unreasonably justified low productivity investments, with adverse medium- to long-term consequences for the government's debt sustainability. The literature on public investments is not short of papers emphasizing public investments that went wrong – badly conceived projects, projects undertaken less for their productive purposes and more for political or countercyclical reasons (Japan's infrastructure programme in the 1990s comes to mind) and of course the so-called “white elephant” projects, where rent seeking and external interests led to the financing of projects that yielded little return. Flyvbjerg et al. (2009) have written extensively on the tendency of mega projects to take far longer to implement, cost far more than originally planned and yield lower gains than designed. This concern is not only an issue in low income countries but in emerging markets and even industrial countries. Togo and Wood (2006), in their analysis of the United Kingdom's Golden Rule, emphasize that a “robust set of budgetary control and capital appraisal processes need to be established to ensure investment projects are efficient and take into account value for money considerations” and to ensure that incentives are in place “to improve

---

<sup>6</sup> This criticism has even been leveled against the United Kingdom, when some felt that optimistic growth forecasts were used to support higher levels of government borrowing and public investment while maintaining consistency with the Sustainable Investment Rule.

management of existing capital assets" (p. 89).

Transparent accounting and reporting practices for public investment funds could foster confidence among taxpayers, governmental units that provide funds and recipients. Accrual-based budgeting and accounting enhances the understanding of sources of funding and commitments, thereby reducing risks of overspending. Under the auspices of the International Federation of Accountants, the International Public Sector Accounting Standards Board has been issuing accounting standards that facilitate accrual-based accounting and reporting.

A third concern about the Golden Rule is that it may give rise to some degree of procyclicality in public investment, since in boom periods, current revenues are particularly buoyant and it is easier to run a current budget surplus. Moreover with strong growth, higher borrowing rates are not likely to raise the public debt ratio significantly. But in lean times, the current budgetary account may yield either no surplus or even be in deficit, forcing disproportionate cutbacks in public investment. Certainly, when faced with the need for fiscal adjustment, governments find it easier to delay or postpone capital projects rather than to lay off workers or cut funding for basic operational expenses. In such situations, maintenance outlays are also likely to be deferred, contributing to higher than appropriate depreciation of public assets as well as reduced productivity of public infrastructure. Institutionally, the Golden Rule, if rigorously enforced, may prove an obstacle to using public investments as a countercyclical policy instrument in a recession. This led Scandizzo and Sanguinetti (2009) to argue for relaxing the Golden Rule in the case of a crisis, allowing exceptions for those expenditures associated with infrastructure for public investments involved in projects with private financing (so long as abuses of such exceptions can be prevented, e.g.

passing off current expenditure as investment).

Finally, and as discussed above, a Golden Rule approach to incentivize current savings in the budget for investment implies limits on current expenditures. As noted previously, this creates a bias against current expenditures necessary for the operation and maintenance of public assets or for the creation of human capital. Treating only investment outlays as assets on the public sector's balance sheet may lead to an imbalance in terms of investments on physical as opposed to human capital formation.

Thus, the challenge faced in deciding on the appropriate level of investments is in part a matter of macroeconomics and the setting of overall fiscal policy targets. But in many respects it is more a matter of ensuring that governments have a strong capacity for making sound decisions on individual investment projects and on the overall investment portfolio.

### **Public investment by subnational governments**

A final issue in the financing of public investment, particularly infrastructure, relates to the role of states and municipalities. In most emerging markets and certainly low income countries, the needs for urban infrastructure are great from the perspective of providing basic universal services and critical in terms of providing the infrastructural services necessary for attracting private investment. Yet most urban areas lack a sufficient revenue base to finance these investments. While provinces or states may have independent sources of tax revenue (income or sales taxes or shared tax bases), most are in a similar position and thus rely on four principal sources of fiscal space: grants from the central government, local borrowing, user fees and private sector financing (direct investment or PPPs).

Space does not allow a detailed consideration of these issues but several points need to be emphasized here.

First, while recognizing the importance of local autonomy, the central government must have some role in ensuring fiscal solvency by subnational governments and some stake in ensuring that large investment projects are assessed and managed rigorously (Ahmad et al., 2005; Ter-Minassian, 2005). This role derives in part from the typically large financing role played by intergovernmental grants (e.g. special purpose grants) from the central government. But it also is related to the central government's exposure to the risk that it may be forced to bail out a bankrupt subnational government entity. Second, moral hazard considerations arise with regard to both issues and the central government needs to ensure that the incentives of a subnational government are to be fiscally prudent and that it does not borrow or spend on unproductive projects. Third, countries differ in the approach taken to ensure the fiscal solvency of subnational governments in a federal system. Reliance on market discipline or cooperative arrangements, which can work in industrial country settings, may be impractical in other countries. Fiscal rules – numerical rules (limits on debt, deficit ceilings, ceilings on spending, the Golden Rule) or administrative or procedural rules (pre-authorization of debt issuance, limits on external borrowing) – may be more the norm in low income and emerging market countries, but with challenges still faced in enforcement and sanctions. Limits on subnational government borrowing are particularly necessary in situations where an subnational government has limited sources of local revenue to service any new debt. In some countries, borrowing is centralized with on-lending to subnational governments. Finally, as noted earlier, central government efforts to ensure a standardized project assessment system are warranted as well as a strengthened institutional capacity to manage PPP contracts and projects.

### **Institutional approaches to strengthen the public investment decision process**

The above discussion has highlighted both the importance of public investments being evaluated according to best practice techniques, and the value of an institutional mechanism to facilitate such an evaluation process and to limit the excessive intrusion of political economy factors into the investment decision process.

In the current environment, the institutional mechanism must be further reinforced to ensure that the implementation of an investment is carried out according to the project design and is able to be adapted in the context of unforeseen factors in an economically sensible way. This also requires the development of appropriate standards of good governance and transparency in the procurement policies associated with public investment. Good project design can be rendered less cost-effective if procurement decisions prove politically motivated or subject to rent seeking. Even after the investment has been put in place, realizing productive public or privately financed public infrastructure projects will require a capacity both to manage operations and maintenance and to enact and enforce regulatory measures that facilitate or mimic competitive markets, set price caps for infrastructural services and implement efficient user fee policies (Sutherland et al., 2009).

The United Kingdom and Australia both provide good examples of new approaches that seek to depoliticize and strengthen the project assessment, decision, implementation and management processes. In late 2008, the United Kingdom passed legislation that established a new Infrastructure Planning Commission (IPC) with the aim of fast-tracking infrastructural schemes of national importance. Each national ministry (in areas

such as energy, aviation, road and rail transport, and water and sanitation) was expected to set out a national policy statement detailing its national infrastructural priorities. The decision whether to go ahead with a project would then be taken independently by the IPC, operating within a framework established by ministers.

Australia moved to depoliticize both the assessment and the decision processes for public investment. It established Infrastructure Australia, whose principal function was to assess infrastructure priorities independently of the originating infrastructural ministries and state governments. The goal was to obtain a clearer picture of which projects yielded the greatest value for money in relation to national infrastructural priorities.<sup>7</sup> Cost–benefit analysis was to be used, project risks assessed and the potentiality for leveraging private sector financing considered. In relation to the latter, Infrastructure Australia was expected to “review and provide advice on measures to improve harmonization of policy and regulatory regimes that facilitate infrastructural development as well as to identify barriers or disincentives to investments in nationally significant infrastructure” (Infrastructure Australia website). It was also expected to carry out regular audits on the condition of existing infrastructure, clarifying where there were critical infrastructural bottlenecks and formulating a prioritized list of projects worthy of consideration for investment. A major cities unit was also established in the office of the infrastructure coordinator for the consideration of urban infrastructural needs.

Decisions on the proposed infrastructural investment programme of Infrastructure Australia were then to be made by the

---

<sup>7</sup> Infrastructure Australia is reported to have expressed concern about the varying quality of the cost–benefit analyses carried out by states (*Australian*, 2009).

Council of Australian Governments, taking into account revenue availability from central government budgetary surpluses, available savings built up in the Futures Fund and borrowing prospects, with a central government body, the Building Australia Fund (BAF), drawing on these resources for the financing of national infrastructural projects. The BAF was modeled on Norway’s Government Petroleum Fund and was established in 2008 to utilize budgetary surpluses for the purpose of infrastructural investment, with more independence in terms of the timing of expenditures (Martin, 2008). In the absence of sufficient financial resources in the BAF and with limits on the proposed borrowing programme, the government would be expected to explore the potential role for the private sector.

Thus, four key elements of the Australia approach are: the establishment of a body separate from state governments and ministries to provide an independent assessment of projects’ value for money; the establishment of a shelf of priority projects for implementation, subject to financing availability; the provision of a national perspective on infrastructural priorities; and the ability of Infrastructure Australia to “overcome any tendency of spending ministries to consider only a limited set of investment options” (Sutherland et al., 2009).

### **Drawing in the private sector through public–private partnerships**

Fiscal space limitations and debt sustainability considerations have led governments to assess the potential role for private sector financing for some of the recognized public infrastructural investment needs of the future. PPPs in particular have become a prominent modality for working with the private sector in the construction and operation of public infrastructure projects, with substantial experience gained over the last decade in Latin America

(particularly Chile and Mexico), the Caribbean, South Africa, and South and Southeast Asia. And while the current recession has proven a speed bump to governments in accessing such financing, it is likely that over time, private financing sources will once again be available and interested in partnering with governments on public infrastructural projects.

Four important points need to be recognized. First, there are some areas of public infrastructural spending where the private sector may be willing to invest and provide services without the need for a PPP (e.g. in the telecommunications sector). There are also sectors where a public enterprise has been privatized, e.g. in the water sector, and where the private sector firm has taken over the delivery of services. The challenge in such situations is typically for the government to ensure that the same public policy factors that originally motivated public sector investment and provision, e.g. equity factors, natural monopoly conditions or externalities, are taken into account in the way in which the private sector produces and delivers services. Here the government's task is to ensure that a clear and well-designed regulatory structure is in place, perhaps including a pricing policy.

Second, private financing in the form of a PPP entails both opportunities and risks to a government, and management of these risks is essential if there is to be a genuine sharing of both the gains and the associated risks between the public and private sectors. Third, PPPs are not suitable for all public investment projects and as with privatized utilities, successful reliance on PPPs requires substantial government involvement in their monitoring, evaluation and regulation throughout the contract period. Fourth, because private sector financing cannot necessarily be relied upon (as the current global financial crisis has illustrated), governments should intensify their efforts to mobilize fiscal space and to

prioritize what public investment projects should be implemented.<sup>8</sup>

Typically, in the words of an IMF study (2004), PPPs entail the “private sector supply[ing] infrastructural assets and services that have traditionally been provided by the public sector, often with government as main purchaser”. The role of the private sector can be in the design, building, financing and operation of the scheme, with many PPPs in advanced countries involving all of these elements. Governments have used PPPs for the building and operation of hospitals, schools, prisons, roads and water supply, and waste management facilities, though experience suggests that PPPs operate more effectively for economic rather than for social infrastructure projects (Akitoby et al., 2007). Usually, a PPP entails for an asset to be transferred to the government at less than its true residual value when the operating contract ends. Often the private sector can work with government to collateralize the project income stream for a concession (e.g. toll revenue) using the collateral as the basis for the issuance of securities to the financial markets, thus tapping private sources of finance.

What makes a PPP attractive to a government is the ability to harness the potential of the private sector to construct and operate a facility with greater efficiency than would be the case for the public sector, with such efficiency gains offsetting the presumably higher borrowing or equity costs associated with private as opposed to government borrowing. Such efficiency gains are particularly relevant when the private sector can bundle the construction and operating phases of a project, thus allowing for internalization of cost-reducing

---

<sup>8</sup> To illustrate this contention, the *Wall Street Journal* (2009) recently reported that India's infrastructure investment programme is “struggling to find private investors needed to participate in expanding roads, ports airports and power”. They report that “many capital market firms find debt-heavy infrastructure projects too risky”, with the highway authority, for example, putting out poorly conceived projects that were said to be “unbankable”.

incentives (Scandizzo and Sanguinetti, 2009). At the same time, by substituting the private sector for public provision, the government can also save scarce public funds and relieve strained budgets.

While PPPs can thus ease financial constraints on infrastructural investments, they can also be used, inappropriately, to bypass spending controls and move public investments off budget and debt off the government's balance sheet. This could leave governments bearing most of the risks involved and facing large fiscal costs over the medium to long term. This underscores that a key challenge for governments entering into PPP arrangements is to ensure that there is an appropriate distribution of risks between the public and private sectors.

Experience also suggests that for a PPP to work effectively and to be an appropriate approach, several key prerequisites should be satisfied: the quality of services should be contractible; there should be competition or incentive-based regulation; as noted, there should be an appropriate distribution of risks; the institutional framework should be characterized by political commitment, good governance and clear supporting legislation (including with regard to pricing); and there should be a transparent procedure for the award of performance incentives and the enforcement of sanctions throughout the concession period. Finally, the government needs to have a capacity, both in the finance and sector ministries, to effectively appraise and prioritize public infrastructure projects; design PPPs; evaluate affordability, value for money and risk transfer; correctly select those projects that are appropriate to undertake as PPPs; draft and scrutinize contracts; monitor, manage and regulate ongoing projects; and undertake periodic performance evaluations (see Sutherland et al., 2009; Scandizzo and Sanguinetti, 2009; IMF, 2004; Ter-Minassian et al., 2008; and Tchakarov, 2007). This extensive list of prerequisites highlights the value of moving at a

deliberate pace in developing a reliance on PPPs for public investment.

In terms of negotiating the distribution of risk, some are appropriately borne by the private partner – those associated with the construction or the operation of the project in particular. Others, such as political and regulatory risk, clearly inhere in the government. Still others – such as market demand risk, some supply-side risks (the cost of foreign exchange, some factor cost risks) – may be influenced by government but are not fully under its control. How such risks are shared is an obviously important and sensitive aspect in the negotiation of a PPP with a private partner, since it will bear on the size of the contingent risks to which a government is exposed. Inevitably as well, for any project that is likely to extend for a decade or more, there will be a need for some flexibility and renegotiation of the original terms, as the underlying assumed market conditions can change enough to render the original assumptions irrelevant. In the context of mega projects, Flyvbjerg et al. (2009) suggest that two important ways of limiting risk are to ensure that the proposing and the approving institutions share financial responsibility for a mega project, and that private financiers participate in financing the project with their own capital at risk.

Governments entering into PPPs also need to be aware, from the experience of many countries, that contracts often need to be renegotiated. Tchakarov (2007) notes that in Latin America and the Caribbean, over 30 per cent of PPPs were renegotiated (particularly in transportation and water projects), often within the first two to three years of the award of a PPP. Key factors forcing renegotiation have included the fixed term nature of concession contracts, the challenges posed by demand risk, poor decisions at the design stage, government acceptance of aggressive bidding or changes in the rules of the game by the government after the contract award. Tchakarov also notes that an “improper

regulatory framework and poor regulatory oversight [can] increase the chances of conflict, rent capture by operators, or opportunistic behavior by government”.

In sum, private sector financing offers important opportunities for governments to augment fiscal space for infrastructure, but successful exploitation of this source requires important capacity-building within governments to ensure both fiscal savings and efficiency gains relative to public provision.

### **China and India: sources of infrastructure financing**

Over the last decade, China has dramatically expanded its infrastructural investment programme (reaching 14 per cent of GDP by 2008) (Lall et al., 2008). Indeed, in the recent financial crisis, China has increased its infrastructural spending by as much as 3 per cent of GDP, far more than other countries. The obvious question is how these investible resources have been mobilized (particularly since the spending has not been associated with a dramatic expansion of China’s overall government deficit).<sup>9</sup>

There are several key features to China’s approach. First, like other countries, China has sold public property through privatization initiatives and used the receipts to finance new investment, with provinces and municipalities leasing, on a long-term basis, publicly owned land. Given the absence of privately owned land since the 1949 revolution, this “resource” of the state has proven a fertile source for financing infrastructural investments, with foreign enterprises being a significant source of know-how.<sup>10</sup>

<sup>9</sup> This discussion is largely drawn from a recent Asian Development Bank paper by Lall et al. (2008).

<sup>10</sup> While this approach has proven very effective, there are presumably limits to the extent to which this is feasible, once one has leased much of the most attractive land within urban and suburban areas. Distributional concerns could also be

Second, much infrastructural financing has derived from three important sources: corporatized enterprises owned or controlled by a province or municipality; subnational government agencies; and state-owned commercial banks linked with a municipality or province. This has exploited another key feature of China’s development strategy, which is to allow a high level of retained earnings in state-owned enterprises, with little dividend remittances to the central government.<sup>11</sup> Similarly, with little alternative options for investments, household savings have largely been channeled into either the banking or insurance systems and these financial institutions have largely utilized their excess reserves for loans to either state-owned enterprises or provinces and municipalities. Decentralized fiscal authorities have thus been able to draw on enterprises for equity financing and state banks for loans in relation to infrastructural investments. Also worth emphasizing is the relatively low rate of return earned by enterprises and banks, as well as the suppliers of infrastructural services, at least relative to what might have been expected if such loans or equity financing had been sought from private domestic or foreign sectors.

A final important source of financing has derived from extrabudgetary funds controlled by municipalities and provinces. Unlike many developing countries, China has relied on earmarked user fees to cover the cost of operations and maintenance, with these revenues earmarked to extrabudgetary funds. Some capital subsidies have been provided by the central government budget but these have been limited.

---

raised, since presumably compensation for the land that has been taken from its previous occupants has most likely been significantly less than the lease revenues obtained.

<sup>11</sup> Another form of government investment for the public benefit is through state-owned enterprises. Often, governments establish enterprises that provide the public with essential goods and services. Transparency and accountability are essential for state-owned enterprises.

In sum, more than half (54 per cent) of China's infrastructural projects have been financed by equity investments from local governments, state-owned enterprises and foreign and other investors; a third from loans from domestic banks; and only 16 per cent derived from grant funding (or allocations from the consolidated government budget). Of equity financing, only 2 per cent has been derived from foreign direct investments and 6 per cent from third party equity funding (Lall et al., 2008).

Third, an important characteristic of China's approach has been the "unique role of the National Development and Reform Commission (NDRC) ... [which] combines top-down guidance with a troubleshooting, coordination and clearing house function, which has greatly enhanced execution capacity, especially in dealing with inter-jurisdictional and inter-ministerial coordination" (Lall et al., 2008, p.2).

It is useful to contrast this approach with that of India. User fees in India are much lower than in China and do not cover all operations and maintenance costs, so that government subsidies are needed to cover these costs. Indian municipalities and states have also been less able to draw on state enterprises for equity financing of infrastructural investments. While financial markets in India are also repressed, with state banks limited in their potential lending rates, they are also more involved in lending to private and state enterprises, so this avenue of public infrastructural financing has proven more limited. Thus, budgetary contributions constitute a much larger share of infrastructural financing in India, subjecting these grants much more to fiscal space constraints. Lall et al. (2008) also note that there is "no equivalent in India of the funding source that is local governments' extrabudgetary revenues deployed as equity in infrastructure projects in [China]" (p. 27). Neither has India been able to monetize land holdings for

infrastructural investments. India has also sought to rely on greater private participation in infrastructure development, thus necessitating the need for regulatory bodies to address the challenges that arise with PPPs. Also in contrast to China, India has had difficulties in its coordination among relevant agencies involved in infrastructural investments, leading to "executive gridlock" and shortfalls and delays in implementation. Lall et al. (2008) note that "there are many reasons cited for the shortfall from delays due to land acquisition and environment clearances, equipment availability, pipeline of projects not being ready – but in reality, it comes back to the issue of inadequate planning and coordination" (p. 32).

What is important to emphasize about China's approach has been the extent to which fiscal space for public infrastructural investment has exploited the use of privatization receipts and user charges. For the latter, the distributional and equity challenges for most low income countries of relying on user fees to cover capital and operations and maintenance costs are not to be minimized, particularly for sensitive services – such as water. This problem is further exacerbated when administrative collection capacity is weak. Efficiency issues also consistently arise in the case of natural monopolies. But China's approach is instructive in that important fiscal space has been derived from this source, at least for operations and maintenance and capital service costs, if not for the initial investment outlay. China's ability to exploit its ownership of land is also not easily replicated in most countries. But certainly countries may need to explore whether there is scope for intensified privatization. This is particularly relevant when there is justification for state involvement in a sector or the possibility for using "eminent domain" for the purpose of infrastructural investments.

### III. Challenges in using public investment as a countercyclical policy instrument

The current financial downturn and the stimulus packages adopted by a number of industrial and emerging market economies have rekindled interest in the potential role that public investment can play among countercyclical fiscal tools. Several OECD and emerging market countries – notably Australia, Canada, China, Germany, Mexico, Poland and the United States – have incorporated public investments into their stimulus programmes in varying degrees, with Australia and China being the most prominent (reaching almost 3 per cent of GDP). Most investment programmes are less than 1 per cent. Box 1 provides details on the composition of the United States fiscal stimulus package. Box 2 illustrates the kinds of investments supported by the different countries.

In principle, public investments have several potential advantages as a means to support aggregate demand. They potentially have a relatively high Keynesian multiplier (possibly as high as 2), particularly if largely labour intensive and not heavily reliant on imports (Solow, 2005). They can target industries most affected by a recession, notably the construction and durable goods sectors. They can be utilized flexibly, particularly in low income countries, as public work schemes can bolster employment, especially in rural areas. Finally, they can do double duty, contributing not only to

immediate aggregate demand support but also to the creation of infrastructure that supports longer-term growth prospects.

But several problems are associated with using public investments for countercyclical policy. Examining these problems highlights the prerequisites for such investments being used successfully. First, the response to the present crisis suggests that most countries do not have a shelf of “shovel-ready” projects (Kuroda et al., 2006) of the kind that, in the words of the OECD (2009), are “aimed at stated policy goals and advanced enough in planning to be implemented quickly and effectively”. With the exception of durable goods purchases (ambulances, police cars, school buses, fire engines, laboratory equipment) and possibly asset rehabilitation projects (periodic road maintenance or road rehabilitation), infrastructure investments take time to design and evaluate before substantial expenditures can get underway. This is particularly true for investment projects that break new ground in terms of technologies or infrastructural networks. Legislative lags can further delay the implementation of an infrastructural investment programme. Bottlenecks in the construction sector or in the capacity of ministries to spend may also contribute to significant implementation lags (Eskenen, 2009). Again, the OECD (2009b) notes “a period of crisis does not lend itself to complex investment projects which typically require careful and lengthy planning” (p.4). This is a fortiori even more the case for mega projects.

**Box 1. United States: components of the American Recovery and Reinvestment Act of 2009 (in billions of dollars)**

<b>Tax relief</b>	<b>\$288</b>
Individuals	(237)
Companies	(51)
<b>Health care</b>	<b>\$147</b>
o/w Health information technology	(19)
Health research and NIH construction	(10)
<b>Education</b>	<b>\$91</b>
<b>Aid to low income workers, retired, unemployed and Social Security recipients</b>	<b>\$82</b>
<b>Infrastructure investment</b>	<b>\$81</b>
o/w Core investment (road, railways, sewers, bridges, other transportation)	(51)
Government facilities and vehicle fleet	(30)
<b>Supplemental investment</b>	<b>\$15</b>
o/w Broadband and internet access	(7)
<b>Energy</b>	<b>\$61</b>
o/w Electricity smart grid	(11)
For state and local government investment in energy efficiency	(6)
Renewable energy	(6)
<b>Housing</b>	<b>\$13</b>
<b>Scientific research</b>	<b>\$9</b>

<b>Other</b>	<b><u>\$18</u></b>
<b>TOTAL</b>	<b>\$805</b>
<b>Percentage for public investment</b>	<b>20%</b>
<b>As share of 2009 projected GDP</b>	<b>1.1%</b>

**Box 2. Characteristics of public infrastructural investments observed in recent fiscal stimulus packages**

**Canada:** investment in roads, bridges and public transport, green infrastructure, as well as in knowledge and health infrastructure, investment in social housing and support for home renovation

**China:** rural infrastructure, water, electricity, transportation, the environment

**Germany:** for infrastructure, mostly education, hospitals, transport and information technology

**India:** infrastructure projects in rural areas

**Indonesia:** infrastructure, mainly roads

**Japan:** subsidy to municipalities to repair and make quakeproof public facilities

**Mexico:** rebuilding of nation's infrastructure

**Poland:** stimulating investment in telecommunications infrastructure, renewable energy

**United States:** large infrastructure investment (roads, public transit, high speed rail, smart electricity grid and broadband; modernize classrooms, labs and libraries; fostering renewable energy production investments)

*Source:* OECD (2009b).

Even with regard to maintenance and rehabilitation spending, surprisingly few countries, states or municipalities have asset registries that clarify the condition of assets or specify the schedules for when substantial maintenance or rehabilitation investments are needed and which could be used for accelerating spending in the context of a recession. Even if such registries were available, there would still be limits as to how many investments could be quickly accelerated in a recessionary situation. Logistical issues would limit the

number of roads that could be shut down at any one time or the number of schools for which it would be practical to place students in a temporary classroom situation.<sup>12</sup>

In the absence of a shelf of projects, spending on many desirable projects is unlikely until well after the onset of the

<sup>12</sup> The United Kingdom's Building Schools for the Future project was announced in 2002 but did not incur significant expenditures until 2006 because of the logistical challenges of selecting sites, relocating students and agreeing and finalizing contracts.

recession. One interesting example that predates the current crisis is the United Kingdom, which undertook several years ago to increase its public investment levels by 1 per cent of GDP. The evidence suggests that it took almost four years to raise the public investment ratio by this amount. In fact, most major investment projects took about three to four years before major new expenditures were incurred.<sup>13</sup> In the current crisis situation, even Germany, for which infrastructural investments are not a major part of the fiscal stimulus package, has experienced serious delays in project spending. If a country were confronted with a sustained and deep trough in demand, this spending lag would not be a problem, though the demand effects of the investment might be slow in coming. But if the recession is not likely to last for more than a year, the likelihood is that countercyclically inspired investments might have a procyclical effect, stimulating aggregate demand just when it is already surging in the context of a recovery. Empirical studies of fiscal policy confirm such a procyclical effect (Kraay and Servén, 2008), with fiscal expansion increasing output volatility rather than reducing it. Indeed such policies have been found to undermine long-run growth. Additionally, once fiscal expansionary policies are put into play, it may be difficult to reverse them when times improve, threatening long-run fiscal sustainability.

Further of concern, in the absence of a well-evaluated list of shovel-ready projects, there is a high risk that badly designed projects would be implemented in a crisis. Japan's experience with infrastructural investments in the 1990s often illustrates this point. Many low income countries particularly lack adequate oversight institutions or the capacity to appraise new projects. While quick implementation of public works

projects may provide a temporary boost to demand, the aggregate demand effects may not be very different from that of other measures to stimulate private demand. If poorly conceived, the contribution of such projects to long-run growth is likely to be low.

This is not to argue that new infrastructural investments are not needed or that they could not contribute importantly in the ways suggested in section II to responding to looming policy challenges and sustaining growth. The issue is simply the lead time that is required to develop a detailed, well-designed and well-evaluated shelf of projects that can be put out to tender and begin implementation at the time of a recession.

A further difficulty with the use of public investment as a countercyclical fiscal weapon is that often countries enter a crisis with a fiscal position that is already overleveraged. When public debt to GDP ratios are already high, using fiscal policy levers for further stimulus may prove less than effective, with fiscal multipliers low because of Ricardian effects arising from precautionary savings.

What makes Australia and China unusual in this regard is that both have developed such a shelf of projects and both have entered the current crisis with quite strong fiscal positions in terms of low outstanding public debt. In the case of China, this reflects a development strategy that has pivoted around a high savings and investment rate over the last decade or so. As a result, there have been periods when spending on investments had to be contained in order to prevent an overheated economy. Thus, when the current slowdown struck, many municipalities and provincial governments already had a backlog of projects that had been held back and which were ready to be implemented (though one could raise questions as to whether all the projects "on the shelf" were socially profitable). In the case of Australia, Infrastructure Australia

---

<sup>13</sup> Another illustration relates to the London 2012 Olympics. Here the government had, as early as 2005, developed a proposed scheme of construction in the process of making its successful bid for the games, yet construction work did not seriously begin until 2009.

was established before the signs of a crisis were evident, motivated not by the possibility of a recession but by the recognition of a need to develop a national strategy for infrastructure investment. This left Australia fortuitously well positioned, during the current downturn, to move quickly on a number of projects that had already been evaluated and prioritized.

There is a message of course implied by the Australian and Chinese cases, which is that there is a contingency value in developing a pipeline of shovel-ready, well-evaluated and prioritized infrastructure investments. In the event of a future recession, such a programme would facilitate (though obviously not guarantee) a more premeditated, well-considered perspective on infrastructural priorities, though even in such cases, there would most likely be time lags before implementation is feasible.

#### **IV. Concluding thoughts**

There can be little doubt that most countries in the world face enormous challenges in terms of the need for public investment, starting with a large agenda for infrastructure but also for addressing major deficiencies in the availability of social services and for developing the human capital resources required to meet the complex challenges of this century. Prioritizing public investment decisions will never be easy, because the trade-offs between physical and human capital formation, as well as between the interests of present and future generations, cannot be easily quantified or calibrated. Neither will the factors that have limited public investment in the past be any less binding in the future. For most countries, fiscal space constraints will continue to make it difficult to finance much of the required investment, underscoring the importance of efforts to mobilize additional fiscal resources in the form of additional tax revenues and rationalized expenditure programmes.

Macroeconomic stability and fiscal sustainability must remain important concerns in shaping decisions on the size of a government's overall investment programme. Added to these considerations is the recognition that in times of economic downturn, public investment can play an important countercyclical role.

In terms of the challenge of prioritization, one must watch out for a bias against spending on vital social services. We highlighted earlier the important trade-offs between soft and hard infrastructure, and in particular, the bottlenecks to rapid and sustainable growth that can arise from a scarcity of high quality human capital or from a neglect of basic social services in health and education. While difficult, getting the right balance is not impossible. A good starting point for thinking about priorities between physical and social capital are analyses that highlight domestic and foreign investors' perceptions of what the key bottlenecks to investment are. Equally, it is important to stand back from arguments that simply establish "norms" or targets for social spending. Rather, analysts should seek to clarify and try and understand what the plausible linkages are between investments in social capital and development, taking account of the timing of potential returns.

The potential importance of public investment as a tool for countercyclical fiscal policy has once again been recognized in the current crisis. But that recognition has come too late for most countries in terms of using the tool very substantially in the near term. What approaches are available to governments in addressing the obstacles of the absence of shovel-ready projects and the limits in fiscal space? For the former, an obvious starting point is the development of an asset registry of government infrastructure that specifies an appropriate schedule for maintenance and rehabilitation. Such a registry would not only help guide ongoing government spending on maintenance of public infrastructural assets but would also be

available for an accelerated programme of rehabilitation and maintenance when there is a need for an active countercyclical policy. Next in priority would be for governments to adopt the Australian and Chinese approaches and move proactively to develop a portfolio of appraised, acceptable and prioritized infrastructure projects, with a categorization of those projects that can be implemented relatively quickly. The Australian initiative also is a model of how governments can develop a public investment programme that is responsive to the challenge of enhancing growth. Third, achieving clarity on when the procurement of locally produced machinery and equipment would be desirable can be another axis for providing some countercyclical stimulus. Finally, and not necessarily as productive, some consideration could be given to labour-intensive public works schemes, similar to those adopted by India in recent years, that might provide a form of social safety net for underemployed low income workers.

Concerning fiscal space, the obvious solution in a recession for providing countercyclical stimulus is initially through domestic bank borrowing and possibly domestic non-bank and external borrowing. Here the concern must be to avoid building up excessive liquidity that can sow the seeds of future inflation or excessive borrowing that can increase the vulnerability of the government's fiscal sustainability position. Again, by putting the fiscal position and overall debt levels on a strong footing in normal or strong times, countries are far

better positioned to use these means to access fiscal space in a recessionary period.

Private financing of public infrastructure remains a tempting route for remedying the shortfall in available financial resources to the public sector and offers the possibility of efficiency gains as well. But the lessons of the last decade suggest that this is a route that requires careful planning and preparation in terms of gaining experience and developing appropriate prudential institutional vetting mechanisms. Due diligence is particularly needed to ensure that the government's contingent risk is not so large that public-private partnerships end up being another form of public debt.

Finally, fiscal space concerns also highlight the importance of continued efforts to ensure that when governments do engage in public investments, particularly when financed by debt, projects are evaluated carefully for their social profitability and adequate attention is paid to the management of both the investment and the capital during its lifetime. Particular attention is needed when governments embark on particularly large and ambitious investment programmes, since experience tells us that the opportunities for inefficiency and waste can be substantial. This is what makes the recent efforts by the United Kingdom and particularly Australia to develop institutional mechanisms to evaluate and prioritize their investment programmes worthy of consideration by other countries.

## References

- Ahmad E et al. (2005). Subnational public financial management: institutions and macroeconomic considerations. IMF Working Paper WP/05/108. IMF. Washington DC.
- Akitoby B et al. (2007). Public investment and public–private partnerships. IMF Economic Issues Paper. IMF.
- Aschauer D (1989). Back of the G-7 pack: public investment and productivity growth in the Group of Seven. *Macroeconomic Issues*. 89 (13).
- Australian* (2009). Building fund hit by crisis, Rod Eddington warns. 29 April.
- Belli P et al. (1998). *Handbook on Economic Analysis of Investment Operations*. Washington DC, World Bank Institute.
- Calderón C et al. (2003). Latin America's infrastructure in the era of macroeconomic crises. In: Easterly and Servén, eds. *The Limits of Stabilization: Infrastructure, Public Deficits and Growth in Latin America*. Washington D.C., Stanford University Press and World Bank.
- Calderón C and Servén L (2004). The effects of infrastructure development on growth and income distribution. World Bank Policy Research Working Paper 3400. World Bank.
- Economist* (2008). Building BRICS of growth. 7 June: 80.
- Eskesen LL (2009). The role for counter-cyclical fiscal policy in Singapore. IMF Working Paper WP/09/8. IMF. Washington DC.
- Estache A (2006). Africa's infrastructure: challenges and opportunities. World Bank.
- Flyvbjerg B et al. (2009). Delusion and deception in large infrastructure projects: two models for explaining and preventing executive disaster. *California Management Review*. 51 (2): 170–193.
- Gil N and Beckman S (2009). Infrastructure meets business: building new bridges, mending old ones. *California Management Review*. 51 (2).
- Gramlich E (1994). Infrastructure investment: a review essay. *Journal of Economic Literature*. XXXII: 1176–1196.
- Heller PS (2005). Understanding fiscal space. Policy Development Paper 05/4. IMF. Washington DC.
- Heller PS (2009). *Do Demographic Factors Influence Investment in Infrastructure?* Center for Global Development.
- IMF (2004). *Public Investment and Fiscal Policy*. Washington DC, IMF.
- Infrastructure Australia (2009). <http://www.infrastructureaustralia.gov.au/>

Kraay A and Servén L (2008). Fiscal policy responses to the current financial crisis: issues for developing countries. World Bank Research Brief.

Kuroda H et al. (2006). Building Asia's infrastructure: issues and options. Discussion draft of the 2006 Global Meeting of Emerging Markets Forum.

Lall R et al. (2008). *Developing Physical Infrastructure: a Comparative Perspective on the Experience of the People's Republic of China and India*. Manila, Asian Development Bank.

Little I and Mirrlees J (1974). *Project Appraisal and Planning for Developing Countries*.

Martin P (2008). Tuesday's budget: rebuilding Australia. 10 May. <http://petermartin.blogspot.com/2008/05/tuesdays-budget-rebuilding-australia.html>.

NEPAD (2002). [www.nepad.org](http://www.nepad.org).

OECD (2007). *Infrastructure to 2030: Main Findings and Policy Recommendations*. Paris, OECD.

OECD (2009). *Strategies for Aligning Stimulus Measures with Long-Term Growth*. Paris, OECD.

Roland-Holst D (2006). Infrastructure as a catalyst for regional integration growth and economic convergence: scenario analysis for Asia. Conference paper for the Asian Development Bank.

Scandizzo S and Sanguinetti P (2009). Infrastructure in Latin America: achieving high impact management. Discussion draft of the 2009 Latin America Emerging Markets Forum.

Solow R (2005). Rethinking fiscal policy. *Oxford Review of Economic Policy*. 21 (4): 509–514.

Sutherland D et al. (2009). Infrastructure investment: links to growth and the role of public policies. Economics Department Working Paper No. 686 ECO/WKP(2009)27.

Tchakarov I (2007). Public investment in Thailand: macroeconomic effects and implementation. In: *Thailand: Selected Issues, IMF Country Report 07/231*. Washington DC, IMF.

Ter-Minassian T et al. (2008). Creating sustainable fiscal space for infrastructure: the case of Tanzania. IMF Working Paper WP/08/256. IMF. Washington DC.

Ter-Minassian T (2005). Fiscal rules for subnational governments: can they promote fiscal discipline? Paper presented at the OECD Network on Intergovernmental Fiscal Relations.

Togo P and Woods R (2006). Public investment in the United Kingdom. *OECD Journal on Budgeting*. 6 (4): 63–102.

United Nations, Population Division (2007). *World Urbanization Prospects: the 2007 Revision*. New York, United Nations.

*Wall Street Journal* (2009). India's infrastructure funds fall.