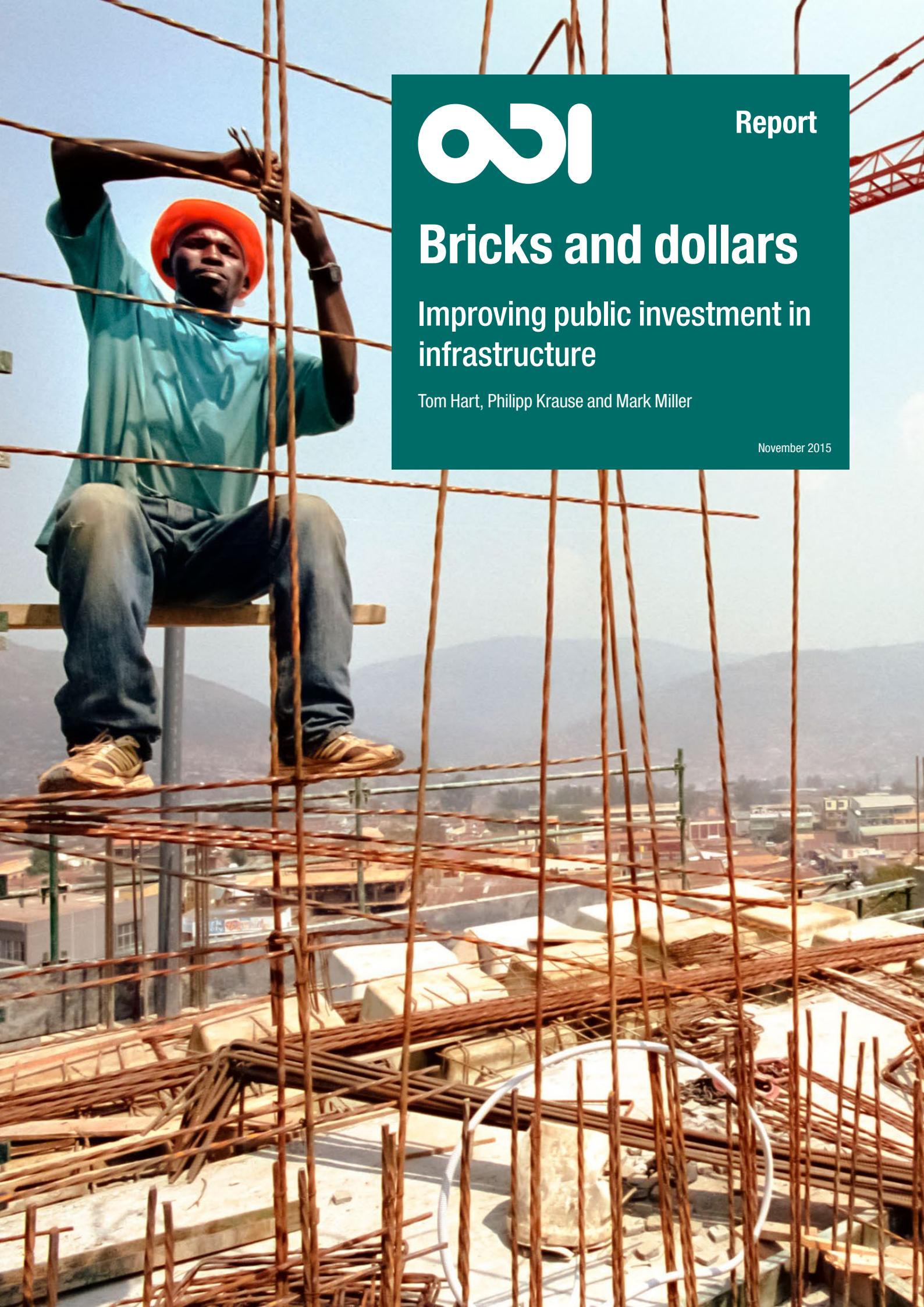

Report

Bricks and dollars

Improving public investment in infrastructure

Tom Hart, Philipp Krause and Mark Miller

November 2015

Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ

Tel. +44 (0) 20 7922 0300
Fax. +44 (0) 20 7922 0399
E-mail: info@odi.org.uk

www.odi.org
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ISSN: 2052-7209

Cover photo: Sven Torfiinn, Panos. Rwanda, Kigali, construction workers on a building site.

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Key messages

- Infrastructure quality affects growth and development. Policy-makers worldwide are providing a welcome push for greater infrastructure investment.
- Past surges in investment have shown that when spending is debt-financed and unproductive it can in fact choke growth.
- Investing in infrastructure is challenging: the returns to investment differ considerably between countries and within countries, and white elephants and cost and time overruns are common even in countries with the most capable bureaucracies.
- Knowledge is improving on the specific technical competencies that might be required to select an efficient portfolio of projects, to implement those projects well and to oversee the financing risks. But this alone does not help to explain why certain countries have improved their capability to invest while others remain stuck.
- Successful institutional transformations rely on broad-based, institutionally appropriate reforms that have a realistic prospect of becoming embedded in different country contexts.

Acknowledgements

The financial support of the Bill and Melinda Gates Foundation in producing this paper is gratefully acknowledged. We thank Ed Hedger for his comments on an earlier draft of this paper. All errors remain with the authors.

1. Introduction

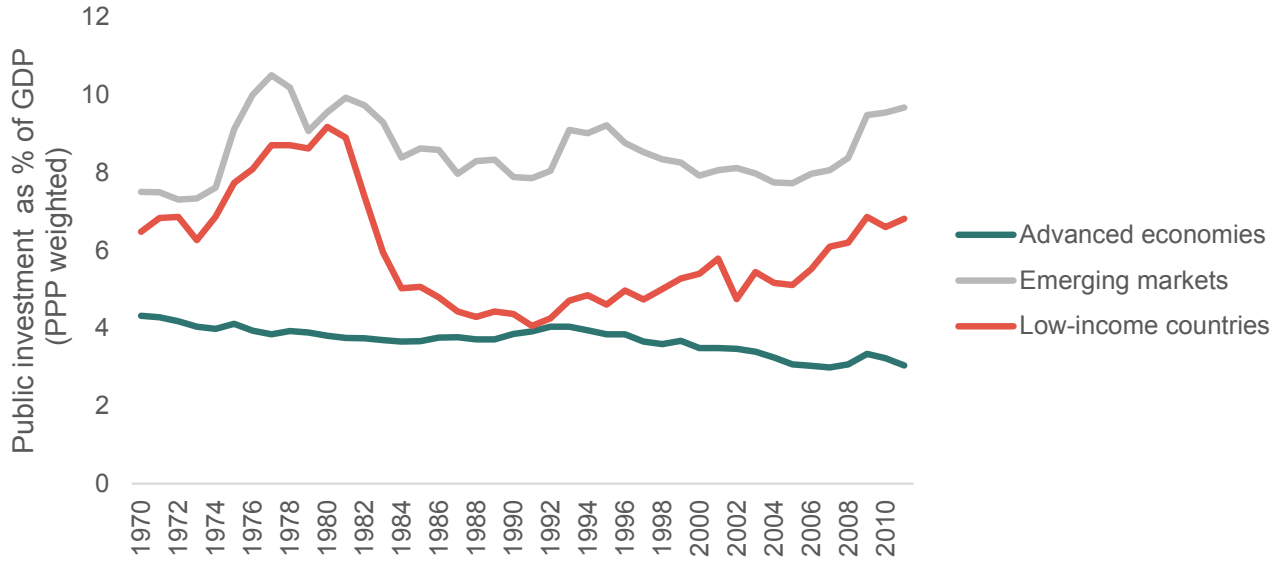
The world is hungry for infrastructure investment – again. There are calls in every world region to close – sometimes rather fantastical – gaps in infrastructure financing. For instance, in 2013, Africa's infrastructure gap was estimated at an annual $93 billion (Foster and Briceño-Garmendia, 2010). In Latin America, the gap is estimated to be 6.2% of GDP per year (Gallagher, 2015). The Asian Development Bank estimated in 2009 that the investment need for Asia between 2010 and 2020 would amount to $8 trillion (*The Economist*, 2015). In 2014, the IMF declared that 'the time is right for an infrastructure push' (IMF, 2014).

This is a marked change in the tone of the international debate, which has emphasised direct poverty reduction over investment following the adoption of the Millennium Development Goals. As shown in Figure 1, after three decades of decline and stagnation, the public capital investment rates of low-income countries and emerging markets have recovered during the second half of the 2000s, although not quite to the peaks seen in late 1970s. However, the number of countries initiating public investment booms[1] equalled the high levels seen in the 1970s, as shown in Figure 2.

On the face of it, this renewed public push for infrastructure holds great promise. There is good evidence that the quality of infrastructure matters for economic growth. Infrastructure can transform access to markets by reducing the costs of trade. In some cases, this has been shown to play a key role in transforming the structure of economies. Studies of the long-term effects of colonial railways have shown that even over 100 years later, when railways have fallen out of use, communities who lived closest to lines and so were able to access markets continue to be richer today (Kerby et al., 2014; Donaldson, 2012). The quality of infrastructure also affects the productivity of firms by reducing the costs of inputs (e.g. energy and transport costs). Reduced production costs can influence decisions by firms on whether to make new investments.

Access to infrastructure has also been shown to improve human development indicators. In Bangladesh, households with access to electricity earned between 11% and 18% more on average than those without (Mold, 2012). Studies have shown that better transportation networks make it easier to access health facilities (see for example Levy, 2004 on Morocco). When sources of water are closer to households, evidence suggests that health outcomes improve (DFID, 2013). Infrastructure can also influence

Figure 1: Public investment, 1970–2011



Source: IMF (2014)

1 A public investment boom is a sustained and significant increase in the government investment ratio. IMF (2014) sets out how this is identified and measured using public-investment-to-GDP data.

education outcomes: studies have found that a safer road network and safe water and sanitation help to raise school attendance rates. Electricity also allows children to spend more time studying (Agénor and Moreno-Dodson, 2006).

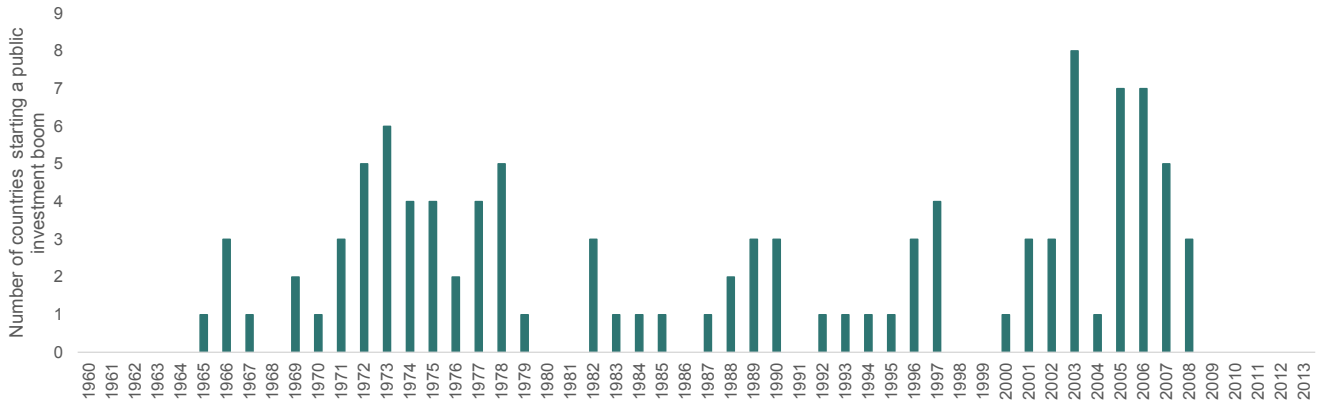
But previous investment booms have not always led to growth. There have been earlier periods of infrastructure enthusiasm, with the white elephants to show for it, but precious little growth. A dollar spent on investment in new infrastructure does not tend to translate to a dollar's worth of improvement in the infrastructure stock (Pritchett, 2000). Debt-financed surges in inefficient investment spending have in some cases been followed by a slump in growth, rather than the anticipated lift-off (Warner, 2014). So, if countries are to step up their infrastructure spending, what lessons can we draw from the past as to why infrastructure has seemingly helped to transform economies in some countries and contributed to recessions in others? One possible explanation is essentially bad luck. If all your neighbours are rapidly growing, then you will get better returns to improving access to your neighbours' markets than if the region is economically stagnant. There may be little that can be done about this. So does this big push for infrastructure make sense everywhere? Should some countries in fact be spending more on cash transfers and less on infrastructure?

The much stronger explanation is that the quality of investment is linked to the quality of government. In this line of argument, there are certain institutional capabilities that can lead to better project selection, better implementation and so greater returns on investment. There is a burgeoning literature on public financial management that asks whether there is a distinct set of competencies that might affect the quality and efficiency of investment spending. The World Bank has undertaken a number of country diagnostics of public investment, reviewing the quality of institutions against a set of eight 'must-haves' that form the foundation of a sound investment management system (Rajaram et al., 2014). Dabla-Norris et al. (2012) compiled an index capturing certain qualities of systems for appraisal, selection, implementation and evaluation of investment projects. More recently, the IMF amended the index and tried to estimate the potential efficiency gains that could be made in improving institutions for public investment (IMF, 2015a).

Does this push to 'invest in investing' stand up to scrutiny? Is it possible to 'invest in investing' so that better decisions are made on what to build, how to build it and how to finance it? The nature of public investment, where spending is often large and paid through discrete contracts, leaves it particularly prone to extraction of rents. Is there still room at the margin to make institutional improvements that can raise efficiency? We know that institutional reform takes decades, not years (Pritchett et al., 2010), but how do we scale-up public infrastructure provision effectively while waiting for those improvements? A number of countries have made remarkable progress in improving infrastructure provision despite the absence of certain institutional 'must-haves': most notably in recent times China and Vietnam, but also Ethiopia.

It would be too easy to describe better infrastructure simply as either a consequence of better government, or of a set of fairly specific technical processes. Are there then certain specific government capabilities that matter more than others? If governments are to invest in investing, are they focusing on the right institutions – those that are likely to give most bang for the buck - or would institutional reform efforts be better targeted elsewhere? Given what we know about institutional reform, what can realistically be done to improve governments' capabilities to invest?

Figure 2: Public investment booms in emerging market and low-income countries, 1960-2013



Source: IMF (2014)

Are things going to be different this time? This paper charts a middle road between a broad institutional perspective and a narrow mechanical view. In order to do so, the following sections will break down the larger issue into more digestible chunks. How does the selection and planning of projects work (Section 2)? How can infrastructure projects be implemented (Section 3)? Does investment in cities raise different challenges for national and municipal goverments (Section 4)? How can governments most effectively draw upon the capital and expertise of the private sector (Section 5)? How can governments manage financing of infrastructure without putting long-term fiscal sustainability at risk (Section 6)? Section 7 concludes by considering what a public financial management reform agenda focusing on infrastructure might look like.

2. How to decide what to build?

Choices about infrastructure are intensely political and often have little technical rationale, yet at the same time, planning infrastructure well is far from irrelevant. Looking at the headlines of infrastructure blunders in rich countries, ranging from the Millennium Dome in London, to Alaska's 'bridge to nowhere', to Berlin's perennially almost-finished airport, developed countries hardly serve as models of rational planning. In many countries, a large proportion of infrastructure decisions are not the result of explicit plans. Rather, they are built into the political system through mechanisms of fiscal federalism, legislative approval mechanisms for public expenditures and other institutions that predetermine who gets to decide what gets built where. At the same time, planning frameworks have proliferated with the aim of avoiding, or at least limiting, the risk of waste, misallocation or corruption.

Making good decisions on what to build and where to build appears to be critical. Decisions made now shape national and regional paths of development. Project appraisal is used as a mechanism to assist decision-makers in filtering out the 'bad' projects and only funding the 'good' ones. A large body of academic and policy research has been dedicated to providing appropriate tools to help inform these decisions (for example, the UK Treasury's *Green Book* – HM Treasury, 2011). In the late 1960s and 1970s, economists developed methods for appraising public investment projects through cost-benefit analysis. These were to produce a simple answer to which projects should be implemented: go ahead with a project if its benefits exceed its costs, but not otherwise. Other countries have developed alternative approaches to appraisal. In South Korea, multi-criteria analysis that factors in considerations of regional equity has been used in project appraisal (Park, 2000).

Even in countries with the most competent bureaucracies, the practical application of appraisal techniques has often disappointed. Empirical studies have shown persistent time and cost escalations in construction projects (Flyvbjerg et al., 2002; CoST, 2011). This has led Flyvbjerg (2014) to formulate the 'iron law of megaprojects': 'over budget, over time, over and over again'. While technical explanations may explain some mistakes, evidence also points to 'optimism bias', where planners and project promoters have a tendency to base decisions on irrational optimism rather than a rational weighting of likely costs and benefits. Project promoters may also underestimate costs and overestimate benefits in order that projects which favour promoters' constituents secure funding over competitor projects.

Some countries do seem to have made some progress in bending this 'iron law'. In the wake of the 1997 Asian financial crisis, the South Korean government introduced a system of pre-feasibility studies and total project cost control, which greatly reduced cost overruns (MoSF Korea, 2014). Another proposed solution is to introduce 'reference class forecasting', essentially creating a distribution of the costs and benefits of the actual outcomes from comparable projects. The aim is create an 'outside view', as the 'inside view' of the project promoter is systematically biased (Flyvbjerg, 2009; Kahneman, 2011).

To what extent are these weaknesses in project selection amenable to improvements through technical fixes? Countries with low-quality governance and limited political checks and balances have higher public investment as a proportion of GDP (Keefer and Knack, 2007). However, this investment is not aimed at stimulating economic growth, but at winning elections. Where politicians cannot make credible commitments to their potential supporters, political support is gained by clientelism, including spending on narrowly targeted public infrastructure and excessive rent seeking, or what has become known as pork barrel politics. White elephants – investment projects with costs that exceed their benefits – are also explained by this logic. Inefficient projects demonstrate the credibility of an incumbent's promises to their supporters, who know these loss-making projects will not be maintained by opposing politicians: 'it is not just that politicians are bad at picking winners, they actually pick known losers' (Robinson and Torvik, 2005). Public investment has thus not been translated into productive infrastructure that can support economic growth.

Changed institutions, not just changed techniques, are needed. Improvements in technical methods to remove sources of bias alone will be insufficient. This needs to be coupled with improved governance structures that create incentives to use and reward accurate feasibility studies. Without the right institutional set-up, even improved technical analyses will not get taken into account.[2] The aim is to use institutional design to alter the incentives both to politicians and to lower-level public sector managers and decision-makers. At a broad level, evidence for this is found in Kenya, where the transition to democracy diminished the ethnic favouritism that dominated the allocation of road building in Kenya under periods of dictatorship (Burgess et al., 2015).

The promise of rule by the technocrats? More specific proposals have often focused on putting decision-making at arm's length from politicians, delegated to technocrats with the expertise and incentives to take the right decision, creating new 'citadels of technocracy' (Harford, 2015). In the UK, an 'infrastructure strategy board' has been proposed that would provide advice on infrastructure priorities to government and be accountable directly to parliament (as supreme audit offices are) rather than to government (Aghion et al., 2013). The World Bank identifies 'independent review of appraisal' as one of eight 'must-have' features of public investment management, and notes the desirability of a formal set of delegations to an entity with an arms-length relationship to government, such as a university or a policy or research institute (Rajaram et al., 2014).

Priorities for reform. The role of selecting which projects are funded will likely be regarded as too much of a core function to remove from executive decision-making in most countries. The priority will be to build a gatekeeper function that can ensure that projects have been through some appraisal process before being selected. How this gatekeeper institution functions and the level of external involvement in prior steps will vary depending on the political context. For example, in dominant-party regimes (Levy, 2014), the focus may be on strengthening the technocratic capability of an already strong centre, such as the ministry of finance. In a competitive clientelist regime, there may need to be attempts to change the incentives for how decisions are taken. The role of independent oversight will then be less about taking decisions than ensuring that the process of decision-making is open and transparent, with the hope that this improves the quality of project selection.

2 In analysing its own experience of project selection, the conclusions the World Bank reached were institutional: decisions are made before cost-benefit evidence is provided, and there are few institutional checks to counteract the influence of advocacy for projects that undermines rigour in project appraisal (IEG, 2010).

3. Putting plans into action

Developing countries are typically not short of colourful and aspirational plans for infrastructure development. In a recent IMF study, low- and middle-income countries, on average, scored higher than advanced economies against criteria of preparation of national and sector plans (IMF, 2015a). The results have often disappointed when translating these visions into reality. One immediate manifestation of this is the low levels of budget execution that are seen for infrastructure in many developing countries. The African Infrastructure Diagnostic estimated that on average just three-quarters of budgets for infrastructure are spent in any given year (Foster and Briceño-Garmendia, 2010). The quality of assets delivered has also often differed from expectations.

Challenges in implementation of infrastructure projects are not specific to developing countries, although problems there tend to be more acute. The study of implementation problems has a long tradition in policy studies (Pressman and Wildavsky, 1973). One recent audit of a country's railway projects found over-optimistic implementation plans, confused governance roles, delayed decision-making and the need for greater programme management capacity and skills. The country in question was not the recipient of a grant to improve governance, but rather the UK (NAO, 2014). Recognising the critical importance of good project management skills has led the UK government to establish a National Projects Authority and a cadre of specialist project managers.

There is remarkably little research about critical qualities of project management in countries where bureaucratic capacity is more limited, with a few notable recent exceptions. Rasul and Rogger (2013) find that 38% of a large sample of Nigerian government projects are never started, and the completion rate varies significantly depending on the management practices of the agency in charge. Williams (2015) finds similarly low completion rates for infrastructure projects in Ghana; the project completion rates also vary significantly depending on the fiscal institutions used to finance them, as well as the political structure of the district where the project is located.

Sven Torfinn Panos. Sierra Leone, Freetown. Children swim in a river near a bridge whose construction has been halted. The Ebola crisis has caused construction companies, many of whom are foreign, to postpone work on major infrastructure projects and send their international staff away from the region

There may be lessons that can be drawn from how institutions for managing investment have adapted according to their own capabilities and specific challenges. For example, a study of Edo state in Nigeria found average cost revisions of 35% and delays of 177% (Porter et al., 2015). These high levels of uncertainty have necessitated a flexible budgeting system. In 2009, just 25 of 69 projects received funding, but there were notable infrastructure improvements, despite the unpredictability of funding. A key factor in the success of China's infrastructure development has been the ability of institutions to adapt and learn in the face of evolving problems (Liu, 2004).

Much of the focus on improving the efficiency of budget execution has been on combating corruption through procurement reform. Support has been provided to enacting legislation that ensures competitive open-market tendering. The effectiveness of such reforms is questionable: Rajaram et al. (2014) cite an investigative report issued by the World Bank Integrity Vice Presidency in 2011 that noted 'widespread fraud, corruption, and collusion plague the roads sector worldwide'. Part of the problem is that procurement reforms have often focused on the formal adoption of OECD best practices, without a good understanding of the incentives and needs of the government in question (Krause, 2014; Krause and Tutunji, 2014; Rocha Menocal, 2014). A system of competitive open-market tendering where bids are awarded to the lowest-cost supplier is rarely used by the private sector for construction, but is universally recommended to developing country governments (Bajari et al., 2006; Wells, 2013). This approach to procurement is well suited to situations where quantities of inputs are well understood in advance, yet this rarely reflects the reality of complex construction projects in even the most developed of economies. In low-income countries, where experience of planning and managing large investments is much more limited, this seems even less likely to reflect reality.

Greater openness is also touted as a way to improve procurement efficiency. The Construction Sector Transparency Initiative (CoST) aims to provide the public with the information necessary to hold governments accountable for better value for money in the construction sector. The greater transparency provided by e-procurement has been found to improve quality and reduce time overruns in Indonesia and India by reducing the cost of acquiring tender information and the potential for collusion between contractors and government officials (Lewis-Faupel et al., 2014).

Spiralling costs of construction and delays in implementation are not just a result of government inefficiency, but may also reflect failings in the construction sector. The role governments can play in promoting construction has largely been overlooked in the literature on public investment – perhaps for fear of being seen to promote collusion. There are, however, examples of the state engaging with the construction sector as a strategic partner in infrastructure development. Collier (2009) cites the example of Botswana, where an annual construction plan was derived from development plans and the construction sector then convened to agree upon what was feasible and how bottlenecks could be addressed. The UK government has used certain high-profile demonstration projects as a way of promoting innovation within the UK construction sector (Cabinet Office, 2011).

4. Investing in cities

In an increasingly urbanised world, increasing amounts of investment will need to take place in cities. A majority of the world's population lived in urban areas for the first time in 2007, and the fastest urban growth is taking place in lower-income countries. The world's urban population is forecast to increase by more than two-thirds by 2050, and nearly 90% of this will take place in Africa and Asia (UN DESA, 2014). An increasingly urbanised world means that development challenges are also increasingly urbanised. Investment in urban infrastructure is needed to drive national and global growth and to serve the needs of this growing urban population. Cities need to provide clean water and sanitation, create the conditions to ensure adequate housing is provided for burgeoning populations and build transport infrastructure to ensure new housing is connected to the city centre (Glaeser and Joshi-Ghani, 2013). How then should national and city governments work together to improve infrastructure services?

There is a large body of research focused on the optimal structure for delivering infrastructure across levels of government: 'the federalism literature is concerned with seeking optimal assignment of responsibilities among different levels of government in support of good governance' (Shah, 1999). The basic guidance from this literature is that functions should be assigned to the lowest level of government possible (taking into account externalities and economies of scale) so that the level of services provided can respond to local preferences and costs. This is not merely a theoretical argument. Faguet (2004) finds strong evidence that public investments in Bolivia changed significantly after decentralisation, responding to local needs.

Practice does not always follow this guidance. The proportion of total public investment spent by subnational governments ranges from above 80% in India, South Africa and Argentina to below 20% in Congo, Morocco, Jordan and Tunisia (Frank and Martinez-Vazquez, 2014).

Qilai Shen, China, Shanghai. Workers on a construction site in the Lujiazui Financial District with the Pearl Oriental Tower in the background.

The complex nature of many government functions means this general advice can be hard to interpret (Bahl and Bird, 2014). Decentralisation is also driven by varied and complex political agendas rather than a simple desire to improve the effectiveness and responsiveness of government (Eaton et al., 2011).

A defining challenge for city authorities facing rapid urbanisation is how to raise and deploy resources to fund growing expenditure needs. Subnational governments tend to have lower revenue mobilisation capacity than central governments (Bahl and Bird, 2014). But shoestring city budgets are also a consequence of inadequate collection of taxes and fees. To improve this, cities need to tax property, capture increases in land value, and price services at cost where this is feasible (Nixon et al., 2015). The argument that financing infrastructure through user fees will help ensure that only socially beneficial projects are chosen (because there is willingness to pay) goes back to Adam Smith's *Wealth of Nations* (Glaeser and Joshi-Ghani, 2013). User fees can also help regulate demand, as is the case with congestion charging for roads. However, other forms of infrastructure, such as water and sanitation, have sufficient externalities from the need to eliminate contagious disease that full price charging may not be justified. And even when there is a strong economic case for introducing land taxes or user fees, time and again there have been political difficulties in introducing such reforms.

In some countries, legal frameworks exist that entitle cities to borrow to finance investment. Cities can improve their creditworthiness by improving their revenue sources and financial management, but the broader domestic regulatory and economic environment will also affect their ability to borrow (Nixon et al., 2015). National governments have given insufficient attention to creating the conditions to improve the borrowing options for local governments (Shah, 2004), but options for this include improving regulations for municipal borrowing and the use of specialised financial intermediaries that can reduce the cost of credit for cities.

Coordination between the multiple levels of government is essential in delivering urban infrastructure. Decisions made by national government will influence urban development, such as investments in nationwide transport and power systems. Responsibilities for managing investment and for managing services may also be split between levels of government. For example, national government may remain in charge of constructing water systems, and then hand them over to a municipal government to operate.[3] The financial constraints of many cities will also mean that capital grants from national government are likely to be an essential part of infrastructure financing. There are thus likely to be tensions between the different levels of government on the appropriate match between how expenditure responsibilities are allocated and the source of revenue to which municipal governments have access.

To meet the demand for increased investment in rapidly growing cities, each country will need to navigate its own path between the potential benefits and the potential drawbacks of decentralisation. The benefits more responsive local governments that can better tailor their investment choices to local needs. The potential drawback is a lower level of investment, as economies of scale are lost and cities have lesser access to finance than national governments. Larger cities, with a larger economic and thus revenue base, have a case for being treated differently from smaller towns (Bahl and Linn, 2014). These choices will be mediated by the reality of national-local politics in each country. For urban managers, these will be taken as given. They will need to improve their own creditworthiness and work to persuade national policy-makers to create regulations and institutions that can improve the financing position of cities.

3 However, the record of such split responsibilities is often poor, with local governments simply running down, rather than maintaining, assets that they did not select and invest in (Bahl and Bird, 2014).

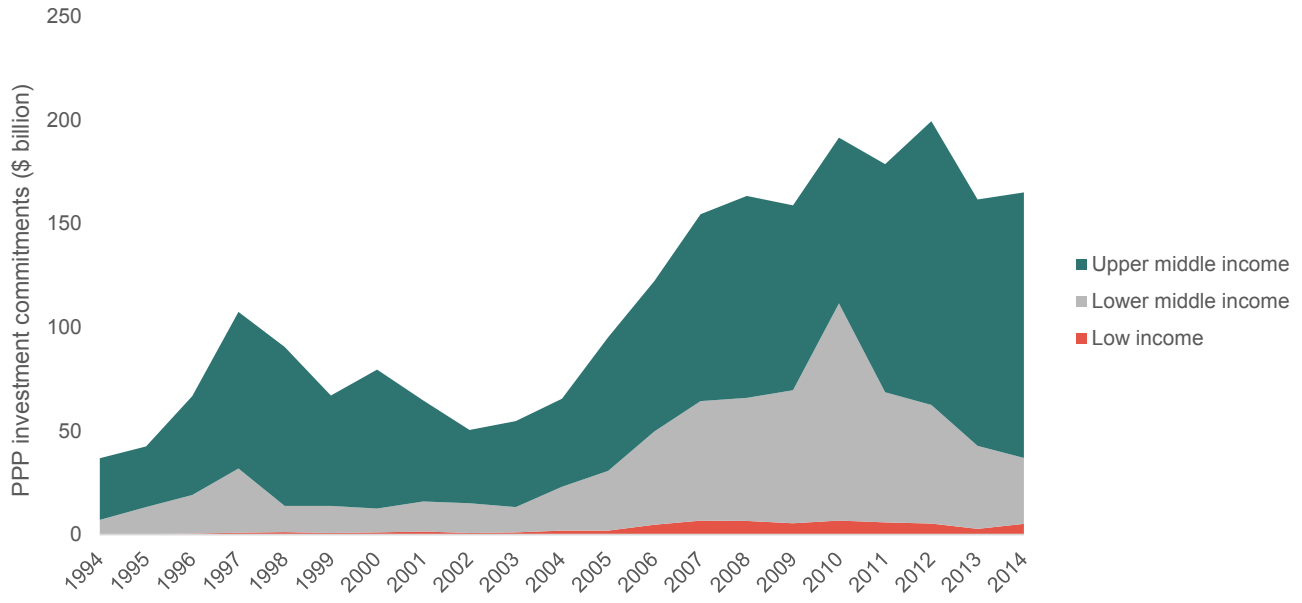
5. Partnering with the private sector

The private sector has some form of participation in almost all infrastructure projects (Trebilcock and Rosenstock, 2015). The most common mode of infrastructure delivery remains the traditional 'design-build' approach, where construction is contracted out to a private operator, but the investment asset is publicly financed and operated. An alternative approach, strongly propounded in the 1980s and 1990s, is for infrastructure services to be fully financed and operated by the private sector, with the public sector playing solely a regulatory role. This is most evident in the telecommunication sector, where the advent of mobile technologies has contributed to a wave of private investment across the globe. Lying between the two ends of the spectrum are a variety of arrangements considered to be public-private partnerships (PPPs).

A PPP is in essence a long-term relationship between the state and a private sector entity. Instead of purchasing the construction of an asset (e.g. a set of buildings and a runway), the state is buying a stream of services from the private sector (e.g. the operation of an airport). The up-front investment in infrastructure is financed by the private sector, and the costs are recouped through a stream of payments from user fees or government subsidies over a longer period (typically decades). The use of PPPs has ebbed and flowed in recent years. After rapid increases in the 1990s, private investment in infrastructure declined in the aftermath of the 1997 Asian financial crisis. In the early 2000s it was possible to talk of the 'rise and fall' of private infrastructure (Harris, 2003). However, private investment then rose rapidly through the remainder of the 2000s, and although this rise tailed off after the 2008 financial crisis, it did not decline as it had after 1997.

The enormous needs for improved infrastructure and continued fiscal constraints in developed economies have contributed to a concerted push to further raise private investment. Despite a global glut in liquidity, volumes of investment in PPPs have remained largely flat in recent years. According to the heads of the multilateral development banks: 'the critical barrier to achieving an uplift in infrastructure investment in emerging and

Figure 3: PPP investment commitments by income-level



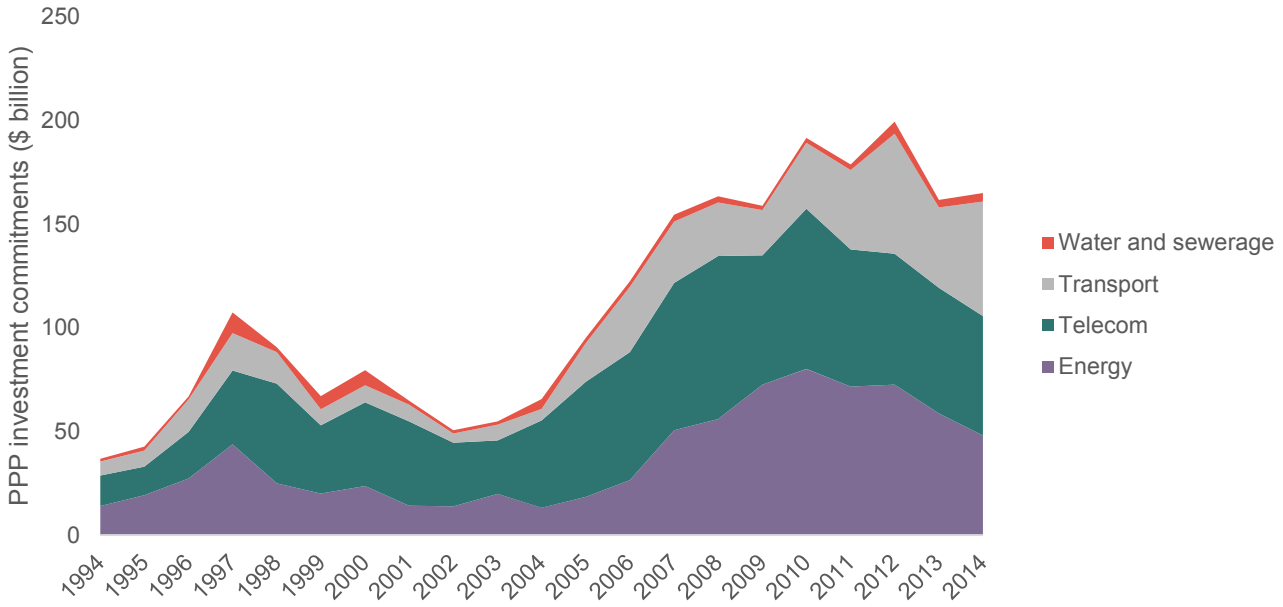
Source: World Bank Private Participation in Infrastructure Projects Database

developing economies is not a lack of available finance, but an insufficient pipeline of bankable projects ready to be implemented' (AfDB et al., 2014). Collier (2014) suggests that in addition to deficiencies in technical capabilities, the 'political entrepreneurism' required to navigate project approvals through the corridors of power is also lacking.

In order for a project to be 'bankable' it needs to be sufficiently attractive to raise private finance (Bull, 2015). For this to happen, investors need to be confident that the returns generated from the infrastructure services to the users or government will be sufficient to justify the risks in investing capital up-front. This helps to explain the concentration of private investment in infrastructure in certain countries and sectors. A large proportion of the PPPs in developing countries have been in middle-income countries (Figure 3), where markets for infrastructure services are likely to be larger than in poorer countries. In 2014, five countries – Brazil, Colombia, India, Peru and Turkey – accounted for 73% of private investment commitments in developing countries, with Brazil alone accounting for 41% (Kasper and Jett, 2015a). Lower-income countries have attracted less private capital, although there have been exceptions. Lao People's Democratic Republic, for example, has attracted $7 billion of investment; yet this has been predominantly to finance electricity generation for export to Thailand (Kasper and Jett, 2015b). Private capital has also tended to be concentrated in certain sectors (Figure 4). In Africa, from 2005 to 2014, 64% of private investment in infrastructure was in the telecoms sector and 18% in electricity. This concentration of private investment has led to the question of whether the lack of bankable projects is really due to a failure of institutions or rather due to a failure of development (Tan, 2011).

In the drive to attract private capital, there is a risk that governments overlook whether such deals offer good value for money for the public. In theory, governments should opt for PPPs because of their potential benefits in terms of efficiency, not simply because a project is 'bankable'. Three features of PPPs lead them to be expected to be more efficient than conventional public investment: bundling, ownership, and risk transfer (Grimsey and Lewis, 2007). First, because PPPs bundle investment expenditure with subsequent operating costs, an operator can be expected to choose the most efficient mix of these costs. For example, the operator will resist the false economy of cost-cutting during the building phase that leads to higher operating costs and lower quality. Second, having ownership control over the asset allows the provider to choose how to produce the service and implement cost-saving innovations (Engel et al., 2013). Third, because the government is paying for the services provided, not for the investment, the construction cost and delay risks are shifted to the private sector.

Figure 4: PPP investment commitments by sector



Source: World Bank Private Participation in Infrastructure Projects Database

In reality, the motivation for turning to private finance has often been to promote infrastructure investment off the government's balance sheet. Accounting conventions in most countries mean that the initial up-front private investment does not affect debt-to-GDP ratios. PPPs can therefore be an attractive proposition for a finance minister under pressure to achieve fiscal targets and address pressing infrastructure gaps. And yet unless the private sector is able to deliver efficiency benefits over a traditional design-build model, then the ultimate financing cost borne by the user or taxpayer is likely to be higher as private borrowing tends to be more costly than borrowing by sovereigns. Engel et al. (2013) argue that because the potential impact of PPPs on the government budget over time is close to public provision they should be accounted for in the same way: 'PPPs should be favoured only when they lead to efficiency gains. To ensure this happens, PPPs should be given the same treatment in budgetary accounting [as] publicly provided infrastructure.'

How then can governments best use the capital and expertise of the private sector to improve infrastructure services? What capabilities require building and how can international actors help to substitute capacity in the short term? A lot of investment has gone into development of project preparation facilities to help address the 'gap' in bankable projects. Evidence on the effectiveness of these initiatives is limited. There is also a distinct set of capacities required on an ongoing basis to manage PPPs. These include skills to evaluate whether PPPs offer value for money, and the ability to manage ongoing contracts with the private sector and to oversee potential contingent liabilities.

6. Who's paying?

The perennial challenge in financing infrastructure is managing the mismatch between the significant up-front investment costs and the lag and duration over which the benefits are realised. This presents a tricky conundrum for a finance minister. On the one hand, infrastructure has the *potential* to raise the productive capacity of the economy in the future: no economy has developed without significant investment in infrastructure. On the other hand, mobilising capital for investment now is not free: all financing options bring with them their own costs.

One option is to finance increased investment through domestic public financing. The recent Conference on Financing for Development in Addis Ababa emphasised the potential to increase domestic resource mobilisation in developing countries; however, raising taxes may deter private investment (Buffie et al., 2012). In certain countries, there may be opportunities to free up resources from non-productive purposes to raise investment in infrastructure. Indonesia has, for example, taken advantage of the lower oil prices to reduce costly subsidies for fossil fuels. However, nationwide protests in Nigeria when similar reforms were enacted demonstrate that such savings are politically difficult to implement. Excessive domestic borrowing also risks contributing to higher interest rates and 'crowding out' private investment.

Attracting external finance for infrastructure can ease the costs of fiscal adjustment, but it come with its own risks. The rise of non-traditional donors, and the role of China in particular, has transformed the external financing landscape for infrastructure. Credit offered by these lenders is often at less concessional rates than the concessional windows of multilateral development banks (MDBs), although procedures are often less burdensome (Humphrey, 2015a). The MDBs are also reorienting their lending portfolios: World Bank infrastructure lending has, for example, recovered to 30-40% of its portfolio from a low of just 19% in 1999 (Humphrey, 2015b). In the wake of the 2008 financial crisis, a prolonged period of low global interest rates has also seen a rise in investor appetite for the sovereign debt of certain developing countries.

Developments in the global economy are giving rise to renewed concerns about debt sustainability. Commodity exporting countries are also being affected by steep declines in the prices of their chief exports in international markets. Expectations of interest rate rises in the US economy have triggered outflows of capital from emerging markets amounting to over $1 trillion in the past year (Kynge and Blitz, 2015). These issues have contributed to the depreciation of a number of emerging market currencies and a sharp rise in the relative face value of external debt. In Ghana, for example, external debt as a proportion of GDP rose from just 23.6% in 2011 to an estimated 42.8% in 2014 (IMF, 2015b). The composition of external debt portfolios may also have greater non-concessional elements than in times gone by, which has implications for the relative costs of debt servicing.

PPPs also constitute a potential source of fiscal risk. As governments use various explicit or implicit fiscal guarantees to attract private financing, there are risks that unforeseen circumstances can lead to liabilities falling to the government. In the wake of the 1997 Asian financial crisis, obligations on PPP contracts in the transportation and power sectors fell upon the governments of Indonesia, Thailand and Malaysia (IMF, 2009).

The proliferation of financing options, actors and initiatives are creating a burden on governments' management of infrastructure financing. Often the countries at highest risk of debt distress are also those with the least capacity. In many countries, debt management has been grouped with management of aid – a tool to mobilise funding rather than one to inform policy-making. Understanding of the pros and cons of the different financing options among government officials is often lacking. International actors are also paying greater attention to the management of fiscal risks from PPPs, but it remains to be seen if recommendations are being adopted.

Irrespective of the source of financing for initial investment, funds also need to be found to finance the continued operation and maintenance of infrastructure assets. Evidence on the optimal resource allocation suggests relative underinvestment in the maintenance of infrastructure. The Africa Infrastructure Country Diagnostic (2008), for example, finds that an estimated $1.9 billion of spending on road rehabilitation could have been saved if sufficient resources had been allocated to maintenance, and about a third of the total cost of addressing Africa's infrastructure needs is for maintenance (Foster and Briceño-Garmendia, 2010).

A set of standard recommendations has been developed, but the problem persists. In the roads sector, road funds financed by fuel levies have been commonly recommended to address under-funding of road maintenance. Increasing electricity tariffs to recover costs of investment and maintenance has been the common mantra in the energy sector. The public finance community has often emphasised the importance of budgeting for recurrent costs of capital investments, as evidenced by a Public Expenditure and Financial Accountability indicator on the same. And yet this issue has been remarkably persistent. Are there novel approaches that have been successful in improving the efficiency of resource allocations?

Finance ministries thus face a complex array of challenges in financing infrastructure. Increased taxing or borrowing for investment must not have macroeconomic costs greater than the benefits infrastructure can bring. Off-balance-sheet PPPs may look superficially attractive, but can carry contingent liabilities and can end up being more expensive than conventional investments. And as investment increases, so too does the financing needed to maintain a higher capital stock. Institutional capacity to deal with these issues must thus be built, but countries should focus on their most pressing needs and articulate their own responses to these, rather than simply trying to imitate what is sold as international best practice.

7. What might a public finance management for infrastructure agenda look like?

Building quality infrastructure to budget and on time is hard for any government. There are many factors involved that can affect implementation negatively, from lack of funds, poor plans and weak investment systems to corruption, waste and theft. Poorly planned, overpriced and delayed infrastructure projects are distinctly not a developing country problem, as evidenced by the many megaprojects in the OECD that turn into costly failures.

Many infrastructure delivery problems are at least in part public finance management (PFM) problems. Especially complicated projects such as airports, power plants and urban transport systems are difficult to build and require a large degree of technical engineering, project management and financing skills. In the public sector, these can often be lacking, at least relative to the private sector. Ensuring there is oversight of private sector firms in order to maintain value for money in contracting and implementation can therefore be a particular challenge. Planning systems, budget systems and procurement systems may be inadequate for the task of delivering infrastructure projects. Many of these issues can be described as 'systems' issues, which can in theory be 'fixed' by better systems. Ideally, these will conform to international best practice, as expressed by diagnostic tools that measure systems quality, such as the IMF's new Public Investment Management Assessment tool (IMF, 2015a). These tools offer a valuable comparative perspective, but they do not in and of themselves represent a reform recipe that could improve infrastructure outcomes.

Some PFM reforms can actually make infrastructure delivery worse. It is by now well known that many PFM reforms pursue best practice forms. In doing so, they distract the attention of governments from solving functional problems (Andrews, 2013; Andrews et al., 2014). Even if they are effective, PFM reforms can impede infrastructure delivery simply because they pursue objectives that do not necessarily help the implementation of infrastructure projects. Both reforms aimed at strengthening fiscal discipline and those aiming for better integrity could, at least in the short run, impede infrastructure delivery by increasing the procedural burden required to release funds, even if they may improve value for money in the long run. Public investment management reforms are a step towards developing PFM reforms that are specifically geared towards infrastructure outcomes, but the work on developing such sector-specific reforms is not yet complete.

Reducing the debate on infrastructure to a series of gaps that need filling with additional financing does more harm than good. Clearly, the notion of a precisely quantifiable gap assumes rather more detailed knowledge about future needs, political viability and cost-benefit trade-offs than governments can realistically expect to have, or even want. It also obscures the way that governments that do successfully build up their stock of infrastructure negotiate the complex interrelationships between revenue-raising, policy-making and implementation capacity.

Judging by the performance of rich countries today, the challenge of infrastructure delivery in developing countries will not be 'solved'. The many examples of cost overruns and otherwise poor performance in investment management in developed countries clearly show that this is a constant challenge, and that good performance is a function of capabilities that need to be maintained and improved on a constant basis. However, tales of megaproject blunders in the OECD should not obscure the fact that rich countries do develop and maintain large volumes of infrastructure without much trouble, whereas many developing countries do not.

A more realistic aim is for governments to consistently improve the effectiveness and efficiency of infrastructure delivery. In order to do so, the international community interested in infrastructure delivery needs to understand the characteristics of governments, not just public finance systems or public investment systems, that deliver better infrastructure outcomes. If a government decides to prioritise infrastructure and wishes to pursue reforms towards that end, then it will have to take into account a wide range of institutional and management challenges. These include the capabilities of central ministries, the political systems that constrain and enable the implementation of infrastructure projects and intergovernmental fiscal relations.

A meaningful infrastructure agenda needs to be about institutions as well as finance. Why do some low-income countries develop the capability to invest as part of a larger institutional transformation on the way to middle-income status, whereas others remain stuck? The answer is much broader than having access to finance or installing a set of investment management systems. Successful countries rely on a set of broadly based and institutionally appropriate reforms that have a realistic prospect of becoming embedded in different country contexts. That sounds a lot less exciting that the promise to fill a multibillion-dollar gap with large funds, best practices and soaring plans. But it might just help to make this time different.

References

AfDB, ADB, EBRD, EIB, IDB, IsDB, World Bank and IMF (2014) *Statement by the Heads of the Multilateral Development Banks and the IMF on Infrastructure*. World Bank Press Release No: 2015/192/ECR, 13 November.

Agénor, P.-R. and Moreno-Dodson, B. (2006) *Public Infrastructure and Growth: New Channels and Policy Implications*. Washington, DC: World Bank.

Aghion, P., Besley, T., Browne, J., Caselli, F., Lambert, R., Lomax, R., Pissarides, C., Stern, N. and Van Reenen, J. (2013) *Investing for Prosperity: Skills, Infrastructure and Innovation*. Report of the LSE Growth Commission.

Andrews, M. (2013) *The Limits of Institutional Reform*. Cambridge: Cambridge University Press.

Andrews, M., Cangiano, M., Cole, N., de Renzio, P., Krause, P. and Seligmann, R. (2014) *This is PFM*. HKS Faculty Research Working Paper Series RWP14-034, July 2014.

Bahl, R.W. and Bird, R.M. (2014) *Decentralization and Infrastructure: Principles and Practice*. Working Paper 14-08, International Center for Public Policy, Andrew Young School of Policy Studies, Georgia State University.

Bahl, R.W. and Linn, J.F. (2014) *Governing and Financing Cities in the Developing World*. Policy Focus Report, Cambridge, MA: Lincoln Institute of Land Policy.

Bajari, P., Houghton, S. and Tadelis, S. (2006) *Bidding for Incomplete Contracts: An Empirical Analysis*. Working Paper No. 12051. Cambridge, MA: National Bureau of Economic Research.

Buffie, E.E., Berg, A., Pattillo, C., Portillo, R. and Zanna, L.-F. (2012) *Public Investment, Growth and Debt Sustainability: Putting Together the Pieces*. IMF Working Paper No. 12/144. Washington, DC: International Monetary Fund.

Bull, M. (2015) *Bankability in Highway PPP Projects*. Presentation at a Knowledge Exchange Event hosted by the World Bank Group in India on 30 January (www.ppiaf.org/sites/ppiaf.org/files/documents/Matthew-Bull-PPIAF-Bankability_India.pdf).

Burgess, R., Jedwab, R., Miguel, E., Morjaria, A. and Padró i Miquel, G. (2015) 'The value of democracy: evidence from road building in Kenya', *American Economic Review* 105(6): 1817-51.

Cabinet Office (2011) *Government Construction Strategy*. London.

Collier, P. (2009) 'Post-conflict recovery: how should strategies be distinctive?', *Journal of African Economies* 18 (suppl 1): i99-i131.

Collier, P. (2014) 'Attracting international private finance for African infrastructure', *Journal of African Trade* 1(1): 37-44.

CoST (2011) *Report on Baseline Studies: International Comparison*. Summary findings of CoST pilot baseline studies. London: Construction Sector Transparency Initiative (http://gateway.transparency.org/tools/detail/43).

Dabla-Norris, E., Brumby, J., Kyobe, A., Mills, Z. and Papageorgiou, C. (2012) 'Investing in public investment: an index of public investment efficiency', *Journal of Economic Growth* 17(3): 235-266.

DFID (2013) *Water, Sanitation and Hygiene*. Evidence Paper. London: Department for International Development.

Donaldson, D. (2012) *Railroads of the Raj: Estimating the Impact of Transportation Infrastructure*. Working Paper No. 16487. Cambridge, MA: National Bureau of Economic Research.

Eaton, K., Kaiser, K. and Smoke, P.J. (2011) *The Political Economy of Decentralization Reforms: Implications for Aid Effectiveness*. Washington, DC: World Bank.

Engel, E., Fischer, R. and Galetovic, A. (2013) 'The basic public finance of public-private partnerships', *Journal of the European Economic Association* 11(1): 83-111.

Faguet, J.P. (2004) 'Does decentralization increase government responsiveness to local needs? Evidence from Bolivia', *Journal of Public Economics* 88(3): 867-893.
Flyvbjerg, B. (2009) 'Survival of the unfittest: why the worst infrastructure gets built – and what we can do about it', *Oxford Review of Economic Policy* 25(3): 344-367.

Flyvbjerg, B. (2014) 'What you should know about megaprojects and why: an overview', *Project Management Journal* 45(2): 6-19.

Flyvbjerg, B., Holm, M.S. and Buhl, S. (2002) 'Underestimating costs in public works projects: error or lie?', *Journal of the American Planning Association* 68(3): 279-295.

Foster, V. and Briceño-Garmendia, C. (eds) (2010) *Africa's Infrastructure: A Time for Transformation*. Washington, DC: World Bank.

Frank, J. and Martinez-Vazquez, J. (2014) *Decentralization and Infrastructure: From Gaps to Solutions*. Working Paper 14-05, International Center for Public Policy, Andrew Young School of Policy Studies, Georgia State University.

Gallagher, K.P. (2015) 'Latin America needs China to help close infrastructure gap', *Financial Times*, 19 May.

Glaeser, E. and Joshi-Ghani, A. (2013) *Rethinking Cities: Toward Shared Prosperity*. Economic Premise No. 126. Washington, DC: World Bank.

Grimsey, D. and Lewis, M. (2007) 'Public private partnerships and public procurement', *Agenda* 14(2): 171-188.
Harford, T. (2015) 'The economists' manifesto', *Financial Times,* 17 April.
Harris, C. (2003) *Private Participation in Infrastructure in Developing Countries: Trends, Impacts, and Policy Lessons*. Washington, DC: World Bank.
HM Treasury (2011) *The Green Book: Appraisal and Evaluation in Central Government*. London: TSO.
Humphrey, C. (2015a) 'The "hassle factor" of MDB lending and borrower demand in Latin America', in S. Park and J. Strand (eds) *Global Economic Governance and the Development Practices of the Multilateral Development Banks*. New York: Routledge.
Humphrey, C. (2015b) *Infrastructure Finance in the Developing World*. Seoul: Global Green Growth Institute.
IEG (2010) *Cost-Benefit Analysis in World Bank Projects*. Washington, DC: World Bank.
IMF (2009) *Fiscal Risks: Sources, Disclosure, and Management*. Washington, DC: International Monetary Fund.
IMF (2014) *World Economic Outlook: Legacies, Clouds, Uncertainties*. Washington, DC: IMF.
IMF (2015a) *Making Public Investment More Efficient*. Washington, DC: IMF.
IMF (2015b) *IMF Country Report for Ghana, No. 15/103*. Washington, DC: IMF.
Kahneman, D. (2011) *Thinking, Fast and Slow*. New York: Farrar, Straus and Giroux.
Kasper, H. and Jett, A. (2015a) *2014 Global PPI Update*. Washington, DC: World Bank.
Kasper, H. and Jett, A. (2015b) *PPI in IDA Countries, 2009 to 2014*. Washington, DC: World Bank.
Keefer, P. and Knack, S. (2007) 'Boondoggles, rent-seeking, and political checks and balances: public investment under unaccountable governments', *The Review of Economics and Statistics* 89(3): 566-572.
Kerby, E., Moradi, A. and Jedwab, R. (2014) 'Three policy lessons from Africa's colonial railways', International Growth Centre blog, 15 October (www.theigc.org/blog/what-policymakers-can-learn-from-africas-colonial-railways).
Krause, P. (2014) *Enabling the Implementation of Procurement Reform in Jordan*. ODI Report to the World Bank. London: Overseas Development Institute.
Krause, P. and Tutunji, L. (2014) 'Three Reasons Procurement is Essential for Development', World Bank, Governance for Development Blog, 11 June (http://blogs.worldbank.org/governance/three-reasons-procurement-essential-development).
Kynge, J. and Blitz, R. (2015) 'Surge in emerging market capital outflows hits growth and currencies', *Financial Times,* 18 August.
Levy, B. (2014) *Working with the Grain: Integrating Governance and Growth in Development Strategies*. Oxford: Oxford University Press.
Levy, H. (2004) *Rural Roads and Poverty Alleviation in Morocco*. Washington, DC: World Bank.
Lewis-Faupel, S., Neggers, Y., Olken, B.A. and Pande, R. (2014) *Can Electronic Procurement Improve Infrastructure Provision? Evidence from Public Works in India and Indonesia*. Working Paper No. 20344. Cambridge, MA: National Bureau of Economic Research.
Liu, Z. (2004) *Planning and Policy Coordination in China's Infrastructure Development*. Background paper commissioned for the ADB-JBIC-World Bank East Asia and Pacific Infrastructure Flagship Study.
Mold, A. (2012) 'Will it all end in tears? Infrastructure spending and African development in historical perspective', *Journal of International Development* 24(2): 237-254.
MoSF Korea (2014) *The Budget System of Korea*. Sejong City: Ministry of Strategy and Finance.
NAO (2014) *Lessons from Major Rail Infrastructure Programmes*. London: National Audit Office.
Nixon, H., Cambers, V., Hadley, S. and Hart, T. (2015) *Urban Finance: Rapid Evidence Assessment*. London: Overseas Development Institute.
Park, H. (2000) *A Study on Applying Multi-criteria Analysis to Pre-feasibility Studies*. Seoul: Korea Development Institute.
Porter, D., Musharraf C., Panthea L., Brisson, Z., Itegboje, O. and Talsma, A. (2015) *Infrastructure Development in Edo State*. Washington, DC: World Bank.
Pressman, J.L. and Wildavsky, A.B. (1973) *Implementation. How Great Expectations in Washington are Dashed in Oakland*. Berkeley: University of California Press.
Pritchett, L. (2000) 'The tyranny of concepts: CUDIE (cumulated, depreciated, investment effort) is not capital', *Journal of Economic Growth* 5(4): 361-384.
Pritchett, L., Woolcock, M. and Andrews, M. (2010) *Capability Traps? The Mechanisms of Persistent Implementation Failure*. Working Paper 234. Washington, DC: Center for Global Development.
Rajaram, A., Kaiser, K., Le, T.M., Kim, J.H. and Frank, J. (2014) *The Power of Public Investment Management: Transforming Resources into Assets for Growth*. Washington, DC: World Bank.
Rasul, I. and Rogger, D. (2013). 'Management of bureaucrats and public service delivery: Evidence from the Nigerian civil service'. Unpublished.
Robinson, J.A. and Torvik, R. (2005) 'White elephants', *Journal of Public Economics* 89(2): 197-210.
Rocha Menocal, A. (2014) *Enabling the Implementation of Procurement Reform in Morocco*. ODI Report to the World Bank. London: Overseas Development Institute.
Shah, A. (1999) *Balance, Accountability, and Responsiveness: Lessons about Decentralization*. World Bank Policy Research Working Paper 2021. Washington, DC: World Bank.
Shah, A. (2004) *Fiscal Decentralization in Developing and Transition Economies: Progress, Problems, and the Promise*. World Bank Policy Research Working Paper 3282. Washington, DC: World Bank.

Tan, J. (2011) 'Infrastructure privatisation: oversold, misunderstood and inappropriate', *Development Policy Review* 29(1): 47-74.

The Economist (2015) 'The infrastructure gap', March 21.

Trebilcock, M. and Rosenstock, M. (2015) 'Infrastructure public-private partnerships in the developing world: lessons from recent experience', *The Journal of Development Studies* 51(4): 335-354.

UN DESA (2015) *World Urbanization Prospects: The 2014 Revision* (ST/ESA/SER.A/366). New York: United Nations, Department of Economic and Social Affairs, Population Division.

Warner, A. (2014) *Public Investment as an Engine of Growth*. IMF Working Paper 14/148. Washington, DC: International Monetary Fund.

Wells, J. (2013) *Getting Better Outcomes on Construction Projects: Suggestions for Modification of World Bank Procurement Procedures*. Research Paper. London: Engineers Against Poverty.

Williams, M. (2015) 'Bricks-and-mortar institutions matter: project delivery and unfinished infrastructure in Ghana's local governments'. Manuscript.

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ISSN: 2052-7209

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Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
Tel +44 (0)20 7922 0300
Fax +44 (0)20 7922 0399

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