Overseas Development Institute

Background Note

April 2011

Mapping the new infrastructure financing landscape

By Christian K.M. Kingombe

This Background Note considers the emerging infrastructure financing landscape, covering traditional sources of finance, new actors and new trends and poses new questions to advance the thinking on new sources of infrastructure finance.

Whilst infrastructure was not included in the United Nations 2000 Millennium Declaration or the Millennium Development Goals (MDGs), there is now widespread belief that most of the goals will not be reached if the infrastructure deficit is not bridged (UN, 2005; Table 1). Infrastructure deficit is a major growth constraint in developing countries. For example, 15 of Africa's 53 countries are landlocked and the population densities in the continent's interior are low and have very low purchasing power, which make infrastructure investments and maintenance very expensive (Goldstein and Kauffmann, 2006).

If Africa is to accelerate progress towards the MDGs, it needs to be able to maintain the high growth rate that it attained in recent years (›5% p.a.) prior to the 2008-2009 crisis. The Commission of Growth and Development (2008) identified five common characteristics of successful growth, which include impressive rates of public investment in infrastructure (Winters et al., 2010). According to some analyses, infrastructure improvements contributed to over half of Africa's improved growth performance between 1990 and 2005 and have the potential to contribute even more in the future, given the advance and spread of telecommunication services. In contrast, the deterioration of power services over the same period reduced growth, with 30 countries facing regular power shortages (Foster and Briceno-Garmendia, 2010). Studies have identified the returns to investment in infrastructure projects as averaging 30-40% for telecommunications, more than 40% for electricity generation and 80% for roads. Returns tend to be higher in low-income than in middle-income countries (Estache, 2008).

In other words, the new 'efficiency' model, which rode in on the global wave of infrastructure privatisation and liberalisation in the 1990s, if implemented correctly, offers benefits too big to ignore – for governments, operators, and consumers. And there is enough experience to guide its implementation (World Bank, 2004), although some results have been disappointing, particularly in the areas of greatest need (Bayliss, 2009).

This Background Note examines various infrastructure financing modalities, which together could help to bridge the infrastructure gap as an indispensable means to achieving the MDGs.

The Background Note describes the unmet investment needs for infrastructure and covers investments in transport and other economic infrastructure sectors. It then provides an overview of the emerging landscape sources of infrastructure financing with an emphasis on private participation in infrastructure projects, development finance institutions both at the bilateral and multilateral level, sovereign wealth funds, emerging powers and the G-20. It concludes with a number of questions related to infrastructure financing.

Unmet investment needs for infrastructure

This section discusses the investment needs for infrastructure and contrasts this information on actual investment in transport and other economic infrastructure.

Investment needs

The future investment needs of developing countries in infrastructure exceed by far the amounts being invested at present by governments, the private sector and other stakeholders, resulting in a significant financing gap (UNCTAD, 2008). Fay and Yepes (2003) estimated empirically the demand for infrastructure between 2000 and 2010 based on expected income growth and structural change. They then calculated the expected annual new investment and maintenance expenditures to satisfy firm and consumer

Table 1: Role of infrastructure in the Millennium Development Goals

	Energy	ICT	Transport	Water & sanitation
MDG 1: Eradicate extreme poverty	Energy increases productivity of firms	ICT improves productivity of firms	Transport facilitates trade of goods	Enables greater workforce participation
MDG 2: Achieve universal primary education	Lighting facilities for reading and studying at home	Improved access to educational material	Ensures access to educational facilities	Reduces burden of domestic work on children
MDG 3: Promote gender equality and empower women	Energy facilitates domestic work			Reduces burden of domestic work
MDG 4: Reduce child mortality	Modern energy reduces respiratory illness	Improved access to public health messages	Ensures access to health facilities	Improved water and sanitation reduces the risk of waterborne diseases
MDG 5: Improve maternal health	Energy improves quality of health care	Improved access to public health messages	Ensures access to health facilities	Improved water and sanitation reduces the risk of waterborne diseases
MDG 6: Combat HIV/AIDS, malaria and other diseases	Modern energy reduces respiratory illness	Improved access to public health messages	Ensures access to health facilities	Clean water, sanitation and hygiene are significant elements of health programmes including HIV/AIDS. Proper drainage contributes to control of malaria and other waterborne diseases
MDG 7: Ensure environmental sustainability	Use of modern energy sources reduces the pressure on deforestation			Access to improved water and sanitation is one of the targets of this MDG
MDG 8: Develop a global partnership for development				

Source: UN-Africa Working Group (2007).

Table 2: Finding resources – the efficiency and funding gaps ($ billion per annum)

Item	Electricity	ICT	Irrigation	Transport	WSS	Gross-sector Gain	Total
Infrastructure spending needs	(40.8)	(9.0)	(3.4)	(18.2)	(21.9)	n.a.	(93.3)
Existing spending	11.6	9.0	0.9	16.2	7.6	n.a.	45.3
Efficiency gap	6.0	1.3	0.1	3.8	2.9	3.3	17.4
Gain from raising capital execution	0.2	0.0	0.1	1.3	0.2	n.a.	1.9
Gain from eliminating operational inefficiencies	3.4	1.2	–	2.4	1.0	n.a.	8.0
Gain from tariff cost recovery	2.3	–	–	0.1	1.8	n.a.	4.2
Potential for reallocation	n.a.	n.a.	n.a.	n.a.	n.a.	3.3	3.3
Funding gap	(23.2)	1.3	(2.4)	1.9	(11.4)	3.3	(30.6)

Source: Briceno-Garmendia et al. (2008) quoted in Foster and Briceno-Garmendia (2010: 12).

demand, finding a substantial regional variation for total investment.

It is estimated that the infrastructure financing gap between what is invested in the Asia and Pacific region (around $48 billion) and what is needed ($228 billion) is around $180 billion every year (Griffith-Jones et al., 2008). Fay and Morrison (2005) and also Fay and Yepes (2003) conclude that annual spending of 3% of Latin America's GDP, around $71 billion, is needed for new infrastructure investment and maintenance, compared with actual infrastructure spending of 2% of GDP, around $47 billion, in 2005 (Griffith-Jones et al., 2008). This leaves the region with an infrastructure financing gap of approximately $24 billion.

Over the next 10 years, Africa's total infrastructure investment needs are estimated at over $250 billion. Furthermore, if Africa is to reach the MDGs by 2015, it needs to achieve an average annual growth rate of over 7%, which corresponds to annual estimated new infrastructure and maintenance requirements of about 9%t of GDP, or $40 billion between 2005 and 2015 (see Griffith-Jones et al., 2010). Foster and Briceno-Garmendia (2010) estimated the cost of addressing Africa's infrastructure needs at around $93 billion a year (about 15% of the region's GDP) (Table 2), about one-third of which is for operation and maintenance,

Table 3: Spending on SSA's infrastructure needs ($ billions per annum)

Infrastructure sector	Operation & maintenance	Capital expenditure					Total spending
	Public sector	Public sector	ODA	Non-OECD financiers	Private sector	Total	
ICT	2.0	1.3	0.0	0.0	5.7	7.0	9.0
Power	7.0	2.4	0.7	1.1	0.5	4.6	11.6
Transport	7.8	4.5	1.8	1.1	1.1	8.4	16.2
Water supply and sanitation	3.1	1.1	1.2	0.2	2.1	4.6	7.6
Irrigation	0.6	0.3	–	–	–	0.3	0.9
Total	20.4	9.4	3.6	2.5	9.4	24.9	45.3

Notes: Based on annualised averages for 2001-2006. Averages weighted by country GDP. Figures are extrapolations based on a 24-country sample covered in AICD Phase 1. Source: Foster and Briceno-Garmendia (2010).

more than twice the Commission for Africa's (2005) estimate. The spending needs are especially large for fragile states' infrastructure. Such countries would, on average, need to devote 37% of their GDP to infrastructure spending. However, they attract relatively little external financing, capturing only 10% of ODA and 6% of private capital flows allocated to infrastructure (Foster and Briceno-Garmendia, 2010).

According to Foster and Briceno-Garmendia (2010) existing spending on infrastructure in Africa amounts to $45 billion a year when budget and off-budget spending and external financiers are taken into account (Table 3). The latter include the private sector, ODA, and financiers that do not belong to the OECD. As much as $15 billion of this overall spending is from external sources.

Foster and Briceno-Garmendia (2010) find that ODA, private participation in infrastructure and non-OECD financiers together exceed public finance that is financed domestically. The private sector is by far the largest source (heavily concentrated in ICT), on a par with domestic public investment. Much smaller, but still significant, capital flows are provided by ODA (especially in water and transport) and, to a lesser extent, non-OECD financiers (significantly in rail and energy). In recent years, there has been a major upswing in total external finance for Africa's infrastructure which has increased from $7 billion in 2002 to $27 billion in 2009. Even so, and despite the growing support from China (Davies, 2010) it is still not anywhere near enough to close Africa's infrastructure funding gap (Foster, 2010).

We now take a closer look at more encouraging trends in private investments in meeting the infrastructure gaps.

Investment in transport infrastructure

Because, in part, of the scale of investment required in infrastructure in each region, governments have opened up infrastructure industries and services to much greater involvement by the private sector. Infrastructure industries have been gradually liberalised since the 1980s (World Bank, 2004). The financial constraints faced by governments encouraged an increasing number of developing countries to open up to Foreign Direct Investment (FDI) and Transnational Corporation (TNC) participation in infrastructure industries in the 1990s. Infrastructure industries now account for a rapidly expanding share of the stock of inward FDI. Between 1990 and 2006, the value of FDI in infrastructure worldwide increased 31-fold, to $786 billion, and FDI in developing countries increased 29-fold, to an estimated $199 billion. As a whole, the share of infrastructure in total FDI stock globally in 2006 was close to 10% compared to only 2% in 1990 (UNCTAD, 2008).

Another measure, foreign investment commitments in private participation in infrastructure (PPI) projects, also indicates that TNCs have invested significantly in developing countries. Between 1996 and 2006, such commitments amounted to about $246 billion, with a concentration in Latin America and the Caribbean between 1996 and 2000 (the region accounted for 67% of commitments). Since the turn of the century, however, TNCs' share in PPI projects has grown relatively faster in Africa and Asia. The group of Least Developed Countries (LDCs) has remained by and large marginalised in the process of globalisation of infrastructure investment, accounting for only about 2% of the stock of infrastructure FDI in developing countries in 2006 (UNCTAD, 2008).

The global financial crisis has affected transport infrastructure financing. The most recent PPI data shows that in 2009 private activity in transport declined for the third consecutive year in developing countries. Investments fell by 20% and the number of projects dropped by 19% in 2009 compared with 2008. New private activity in transport was concentrated in road projects, and in a few large developing economies such as Brazil, India and Mexico. In 2009, 50 transport projects with private participation reached financial or contractual closure in 20 low- and middle-income countries. These projects involved

investment commitments (hereafter, investment) of $19.2 billion. Transport projects implemented in previous years received additional commitments of $2.5 billion, bringing total investment in 2009 to $21.7 billion. This investment level represents a 37% decline from the peak reached in 2006. Activity by number of projects experienced a more pronounced decline than investment, falling by 58% compared with 2006. The average project size grew from $242 million in 2005 to $383 million in 2009, while the median rose from $50 million to $192 million (Izaguirre and Jett, 2010b).

Investment in other economic infrastructure

Telecommunications: Although Information and Communication Technologies (ICTs) have been a remarkable success in Africa and large parts of the ICT sector have been transformed in terms of availability, quality and cost of connectivity (Foster and Briceno-Garmendia, 2010), Africa still needs more laptops, PCs, fibre optic cables and mobile phones for a genuine ICT revolution. It is the only continent in the world where mobile phone revenues are higher than those from fixed line telephone services. Africa also has the world's fastest growth rate in mobile-phone usage (AfDB/OECD, 2009).

According to the latest PPI data in 2009 telecommunications projects implemented in the 1990-2008 period attracted new investment of $57.3 billion, bringing total investment commitments to the sector to $60.8 billion in 2009 – the year that marked an end to the rising trend that began in 2004. Investment in 2009 was similar to the level reported in 2005. The decline in investment affected all segments including stand-alone mobile operators and multiservice providers. This investment decline was caused by a more difficult investment environment in the aftermath of the global financial crisis and market saturation in many countries. The concentration of investment across countries was less pronounced than in the other infrastructure sectors. Brazil and India accounted for 28% of investment in telecommunications in 2009, while these two countries attracted 63% of the investment in the three other economic infrastructure sectors (energy, transport and water) (Izaguirre and Jett, 2010).

The spread of internet in Africa has been far slower and general access to ICT services is much lower than the rest of the world. However, new infrastructure connecting Africa to the rest of the world will soon be operational. Many high capacity international backbone network projects are being built to connect Africa to the rest of the world on an open access basis. Private African capital is behind much of this but there are also public private partnerships (PPPs) with international investors (see section on development finance institutions and infrastructure). Prospects for the future, however, are uncertain as the share price of mobile operators in Africa has fallen heavily. With growth slowing between 2005 and 2009, price competition will increase, reducing the high profits that have sustained capital investment. This means third generation networks probably will be delayed (AfDB/OECD, 2009).

In the context of the Gleneagles Declaration on Africa emerging from the G-8 Summit in 2005 and the EU council's adoption of an EU Strategy for Africa, the EU and its African counterparts initiated a Partnership for African Infrastructure. To support its implementation, the EU-Africa Infrastructure Trust Fund was launched in 2007. A major project being supported by this Trust Fund is the East African Submarine Cable System (EASSy) initiated in 2003 with a €2.6 million subsidy. It entered into service on July 2010 to deliver high-speed Internet access to 20 Eastern and Central African countries (UNCTAD, 2008; AfDB and OECD, 2009).

Drinking water and sanitation in Africa: By contrast, investment in water infrastructure has fallen far behind. In fact, the extent of investor interest in water in sub-Saharan Africa (SSA) was overestimated and the hoped-for private investment failed to materialise (Bayliss, 2009). Water providers need to cover most of the cost of operations and routine maintenance through user charges. Such schemes can account for the differences in affordability through cross-subsidisation between wealthier and poorer users, as well as subsidisation across water and sanitation. Cost-recovery objectives can be facilitated by strengthening the utilities themselves. In most countries, government subsidies are used to provide for the poor, especially in rural areas and for sanitation. But in order to be effective they need to be implemented under certain conditions. New instruments can help catalyse funding, such as: output-based aid, and the sub-sovereign borrowing facilities and pooling mechanisms (OECD/AfDB, 2007).

Government budgets and ODA have been insufficient to cover the scale of investments needed to reach the MDG for access to an improved water source, whose price tag has been estimated at $16.5 billion a year in Africa, while spending is only one-fourth of what is required. To meet the MDG target for sanitation, African countries need to spend an estimated 0.9% of GDP per year, of which 0.7% is for investment and 0.2% for operation and maintenance (Foster and Briceno-Garmendia, 2010). At the same time national water providers have, in general, failed to achieve financial viability; and private participation has often proved disappointing in filling the resource gap (OECD/AfDB, 2007; Bayliss, 2009). In 2009 seven low- or middle-income countries (LICs and MICs) implemented 35 water projects with private participation involving investment of almost $2 billion, according to data from the PPI Database. In 2009 the number of LICs or MICs implementing new private water projects (seven) was the lowest since 1994 (Izaguirre, and Perard, 2010b).

Energy supply: Africa's large energy potential remains under exploited. Limited energy development in Africa has resulted in one of the lowest usage rates for modern energy sources. Africa also faces a power sector financing gap of approximately $23 billion a year. It spends only about one-quarter of what it needs to spend on power, much of which is spent on operating expenditures to run the continent's high-cost power systems, leaving little for the huge investments needed to provide a long-term solution (Foster and Briceno-Garmendia, 2010).

A number of countries have sought to bridge the gap between the potential of their energy and their populations' lack of access to it. In some countries, private-sector participation in electricity companies, coupled with new independent regulators have resulted in greater and more efficient power generation, increased employment, while doubling the number of subscribers (OECD/AfDB, 2004). In 2009, 139 energy projects with private participation reached financial or contractual closure in 21 LICs and MICs, involving investment of $58.5 billion. In addition, energy projects implemented in 1990-2008 attracted new investment of $10 billion, bringing total investment to the energy sector to $68.5 billion in 2009. That investment represents the highest level for the sector in the period 1990 to 2009. Private activity, however, was concentrated on a few countries and electricity generation projects. Brazil and India accounted for 67% of investment and 43% of new projects, and for all of the growth in private activity in 2009. Electricity generation accounted for 79% of investment and 80% of new projects (Izaguirre and Perard, 2010a).

The New Partnership for Africa's Development (NEPAD) is promoting an integrated, continent-wide energy strategy, linked to national policies for growth approach. The NEPAD Heads of States Implementing Committee has asked the African Development Bank (AfDB) to take the lead in regional infrastructure (including transport, energy, water, etc.) and banking and financial standards. The EU-Africa Infrastructure Trust Fund also gives priority support to projects in the energy industry. To be eligible, these projects must be sustainable and encompass a cross-border dimension and/or have a regional impact, be driven by public or private sector entities or with mixed public-private capital, contribute to poverty alleviation and economic development, and involve at least one country in SSA (UNCTAD, 2008).

As part of the work on regional infrastructure, the AfDB has developed a short-term action plan. Several projects, including some in the energy sector, have been prepared for financing by the AfDB. Projects and programmes identified in the short-term action plan were estimated to cost $7 billion. In addition, a medium- to long-term action plan was prepared in close collaboration with the regional economic communities (RECs) and in cooperation with the World Bank and the European Union (OECD/AfDB, 2004).

The emerging landscape of infrastructure financing

The cost of addressing Africa's infrastructure needs is estimated at $93 billion (Table 2). Whilst existing spending is higher than previously thought (see Foster and Briceno-Garmendia, 2010), additional funds will be required, and in a few countries – primarily fragile states – the magnitude of the funding gap calls for the consideration of taking more time to reach targets or using lower-cost technologies. Historical trends do not suggest that there is much prospect of increasing allocations from the public budget according to Foster and Briceno-Garmendia (2010).

Over the past decade external finance has grown and disbursements are likely to continue to grow as committed projects move to the implementation stage. There has been increased emphasis on new sources of finance for African infrastructure such as: development finance institutions (DFIs); public private partnerships (PPPs); private sector banks; Sovereign Wealth Funds (SWFs); emerging powers and the G-20. This section provides an overview of this emerging landscape.

Development finance institutions and infrastructure

Fixed infrastructure in developing countries requires large-scale and long-term investment that private investors often fail to provide. Even the upgrading and extension of networks have continued to be funded largely by multilateral and bilateral loans on concessional terms (Goldstein and Kauffman, 2006). Multilateral and bilateral agencies have also continued to actively mobilise funding for private infrastructure projects (World Bank, 2010).

DFIs have many objectives, including investment in sustainable private sector projects; maximising impacts on development; remaining financially viable in the long term; and mobilising private sector capital. For example, the German and Dutch bilateral DFIs (DEG and FMO) both have to invest in enterprises that contribute to developing country economies. The core business of DFIs is to invest financial resources, but they also provide project-specific and general technical assistance and promote standards in the funds or companies in which they invest. Providing financial resources is the core activity. Estimates based on the annual accounts of the main DFIs show around $33 billion worth of new DFI investments in the private sector in 2009 (in the form of loans, guarantees and equity positions). The International Finance Corporation (IFC) of the World Bank Group and the European Bank for Reconstruction and Development (EBRD) were ranked the largest DFIs in terms of new investments in 2009.

DFIs use different investment instruments. Most

do very little in guarantees. Some specialise almost entirely in equity, including CDC Group PLC (the Commonwealth Development Corporation), as well as SIMEST, Norfund, COFIDES and SIFEM (the bilateral DFIs of Italy, Norway, Spain and Switzerland respectively), although not always exclusively. For example, CDC also has a legacy of loans in some activities, and has worked recently with European Financing Partners (EFP) in providing more loans. The majority of the committed portfolio of others, such as the German Investment Corporation (DEG), Finish Development Finance Company (Finnfund), Netherlands Development Finance Company (FMO), and the French Investment and Promotion Company for Economic Corporation (Proparco) is through loans. Many have stated a desire to invest more in equity funds (FMO), but CDC leads the field globally in this area. IFC and the European Investment Bank (EIB) private equity fund investment is still comparatively small (Kingombe et al., 2011).

Bi-lateral development finance institutions: DFIs invest in a wide variety of sectors, ranging from the financial sector to infrastructure (Table 4). As a rule, DFIs invest most often in financial services and infrastructure projects (Kingombe, et al., 2011).

The biggest European bilateral DFI (EDFI) is DEG ahead of FMO and CDC (Figure 1). EDFIs have similar but different aims and objectives but most are involved in financing and structuring the investments of private companies in developing and emerging market countries. DEG provides it's know-how to, and invests in, profitable projects that contribute to sustainable development in all sectors of the economy. DEG pays particular attention to agribusiness, to infrastructure and processing industries as well as the financial sector. On infrastructure, DEG enables new and extension investments as well as modernisation investments in private infrastructure projects in: electricity generation and distribution; telecommunications; water supply and waste water management.

In 2009, CDC spent 34% of its funding on infrastructure, including telecommunications, power, water, roads and hotels (substantially more than DEG and FMO and the same as Proparco). CDC's own distribution suggests that 8% is spent on narrow infrastructure and 10% on energy and utilities (Kingombe et al., 2011).

Multilateral development finance institutions: World Bank Group

The World Bank (WB) as a whole, including the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA), has provided a total of about $110 billion to support more than 2,000 transport projects in more than 100 LICs and MICs since 1961. Approximately 65% of these projects have been implemented under the Transport Sector Board while the rest are mapped to agriculture and other sectors that have increasingly embedded in their projects transport as a key component (O'Neill et al., 2010).

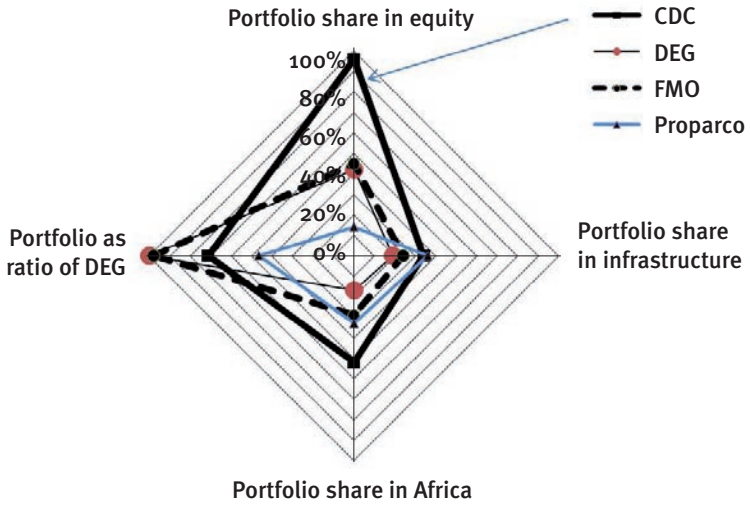
International Development Association (IDA): IDA is the public sector lending arm of the WB and disburses funds as interest-free grants and subsidised loans to the poorest countries, including for infrastructure. It has also provided low-interest concessional loans called 'credits' to support transport development in LICs since its inception. In the past 50 years, spanning the financial years 1961 to 2010, IDA has funded 1,115 projects – one half of the Bank's total transport projects (2,238 projects) – with a India receiving most of this of $28.3 billion investment in transport. This accounts for over one quarter (26%) of the Bank's total lending to transport ($110 billion). It is important to note that IDA transport lending has

Table 4: Sectoral distribution of DFIs' 2009 portfolios

	Financial sector	Infrastructure	Agri-business	Industry/ manufacturing	Other	No. of projects
Bilaterals						
CDC	23%	34%	6%	18%	19% (i)	794
DEG	35%	19%	13%	27%	6%	670
FMO	42%	24%	3%	30%	2%	904
Proparco	45%	36%	4%	12%	2%	354
Multilaterals (commitments in 2009)						
AfDB (ii)	10.8%	52.1%		7%	29.1%*	
ADB (iii)	3.9%	39.9%	3.4%	0.8%	52%	
EBRD	36%	37%	8%	18%	N/A	327
IFC	48%	25%	2%	25%	N/A	567

Notes: Others e.g. include: global financial markets; global manufacturing and services; health and education; oil, gas, mining and chemicals; sub-national finance; ICT; etc. (i) In the case of CDC, the underlying portfolio 'other' sector category e.g. includes: health care 8%; mining 6%; others 6%. (ii) Loan and grants approval by sector in 2009. (iii) Loans. (*) Multi-sector. Source: Kingombe et al. (2010).

Figure 1: Comparing the four largest bilateral DFIs



Source: Kingombe et al. (2011).

increased significantly in the last couple of decades. IDA's share in total Bank lending to transport was just over one fifth (21% in the period 1961 to 1990). It has increased over the last two decades and reached almost one third (30%) in the financial years 2001 to 2010 (O'Neill et al., 2010).

International Finance Corporation (IFC): The IFC is an international organisation established in 1956. IFC's activities are guided by five strategic priorities that allow it to help where it is most needed, and where its assistance can do the most good, including addressing constraints to private sector growth in infrastructure. IFC invested in 255 projects in 58 countries served by IDA in 2010, commitments that totalled $4.9 billion. Those countries where the development needs are deepest accounted for nearly half of its infrastructure and agribusiness investments. IFC investments typically range from $1 million to $100 million. To ensure the participation of investors and lenders from the private sector, IFC, in general, finances no more than 25% of the total estimated project costs (IFC, 2010).

IFC continues to develop new financial tools that enable companies to manage risk and broaden their access to foreign and domestic capital markets. IFC's investment services include: loans for IFC's account; syndicated loans; equity finance; quasi-equity finance; and equity and debt funds. IFC is dedicated to making equity investments in private companies in developing countries. It also invests in and encourages private equity funds, and has created an association to promote this activity, the Emerging Markets Private Equity Association (EMPEA) (Hall, 2006; IFC, 2010).

IFC helps increase access to power, transport and water by financing infrastructure projects and advising client governments on designing and implementing PPPs. IFC adds value by devising innovative projects and PPPs in difficult markets. IFC mitigates risk and leverage specialised financial structuring and other capabilities.

In 2010 IFC invested $1.5 billion in infrastructure projects. IFC strives to deliver what cannot be obtained elsewhere by offering its clients a combination of investment and advice designed to promote sustainable private sector development in emerging markets. IFC calls that special edge its 'additionality' (IFC's Annual Report 2010).

The IFC Board created a new, wholly owned subsidiary to act as a fund manager for third-party capital. IFC Asset Management Company, LLC, provides a fund management platform to raise money from sovereign funds, pension funds and other institutional investors, and invests it using IFC's well tested approach. The objective is to expand the supply of long-term equity capital to developing and frontier markets in a way that enhances IFC's development goals and generates profits for investors (ibid.).

Other multilateral donor infrastructure instruments

There are several other instruments including regional development banks such as the EBRD, and sector specific funds such as the Private Infrastructure Development Group (PIDG).

The EBRD, wholly owned by the member states of the EU, has taken significant equity stakes in some companies and is also a leading promoter of private equity funds in the countries of Eastern Europe and the Commonwealth of Independent States (CIS) (Hall, 2006).

The PIDG was established in 2002 to promote PPI in developing countries. Over the eight years of its operation, the PIDG has grown from one facility to seven; from a single donor to eight (as well as including commercial debt from the private sector). PIDG has grown to a portfolio comprising 30 projects that have received financial support from the Emerging

Africa Infrastructure Fund Ltd (EAIF) and GuarantCo Ltd (GuarantCo) and an additional 42 projects that have received project development support from InfraCo Ltd (InfraCo Africa) and DevCo (PIDG, 2009 Annual Report). The year 2009 saw significant growth and achievement for the PIDG. Two new investment facilities were created – the Infrastructure Crisis Facility Debt Pool (ICF-DP) and InfraCo Asia Development Pte Ltd (InfraCo Asia).

The PIDG delivers its mission and objectives through the activities of a number of private companies and facilities that target specific market and institutional failures that constrain the growth and development of PPI in developing economies. The PIDG operates in a number of key stages of the project cycle to address specific constraints to the participation of the private sector in infrastructure development. While each of the PIDG initiatives target specific constraints, at the highest level, it is convenient to classify them as:

- Project financing initiatives – including EAIF and GuarantCo, which provide long-term debt capital and local currency guarantees respectively, as well as the new lending facility, the ICF-DP
- Project development initiatives – including InfraCo Africa and InfraCo Asia, as well as the technical assistance/ advisory facilities of DevCo and the TAF (PIDG, 2009 Annual Report).

Public private partnerships

Because they lack financial resources, and faced with inefficient state-owned monopolies, many African countries have sought private-sector participation in infrastructure in the past two decades. Many attempts have been made, for example, to plan transport needs more accurately and to facilitate greater private participation in transport investment and management. Attracting the private sector presents the following challenges: identifying potential investors; raising financial resources; writing sound contracts; improving regulatory frameworks; and predicting revenue streams. There are limits to what can be achieved through greater private participation, with some governments, for example, lacking the means to create a PPP unit. Therefore, both government and the donor community will need to continue developing innovative approaches for raising additional public and private resources and learn to use them more efficiently (OECD/AfDB, 2006).

Various forms of PPPs have been tried in airports, seaports and railways, and more rarely for roads. Of all infrastructure sectors, telecommunications have long attracted the greatest amount of private investment in developing countries. While private financing of African infrastructure has surged since 2005, only about 10% of this rise has gone to transport. PPPs are particularly rare in the road sub-sector, because of the high perceived risk (OECD, 2008). Investors' perception of high risk renders full privatisation impractical, so most private participation in transport infrastructure has taken the form of leases or concessions. The results, however, have been mixed (Goldstein and Kauffman, 2006). Nonetheless, investment in transport in general and in road infrastructure in particular has increased in recent years.

The Public-Private Infrastructure Advisory Facility (PPIAF) notes that transport has become the fastest-growing sector in terms of global private activity in infrastructure since 2005. There has been a particular rise in BOT (Build, Operate and Transfer) concessions for road projects. Examples of BOT projects include the Maputo Toll Road (30-year concession since 1996). As a share of total investment in privately-managed road projects in developing countries, BOT concessions rose from 39% in the 1990s to 62% in 2001-06. These projects include both the construction of new roads and the expansion or rehabilitation of existing roads. PBCs (performance-based contracts) are becoming more frequent in this area, combining performance and traditional pay items. Amongst others, South Africa and Chad are designing PBC road concessions (OECD, 2008).

Efficient regulation is needed to derive the maximum benefits from private sector participation. The key factors of success include: strong government commitment to ensure the credibility of the reform process; proper sequencing; and the creation of an independent and well-enforced regulatory body prior to divestiture (World Bank, 2004; Goldstein and Kauffmann, 2006; OECD, 2008).

Financial market conditions remain more stringent than before the global financial crisis. For projects that are able to raise financing, the conditions usually involve lower debt/equity ratios, shorter tenors (i.e. maturity), and more conservative structures. Despite the more difficult environment, developing country governments remain committed to their PPP programmes. Private activity, however, remains selective (World Bank, 2010).

Private equity and investment banks

More recently, financial investors have begun to take major shareholdings in companies investing in infrastructure. Some of these are 'private equity' firms (PE), which specialise in buying all shares so they become 'privately' owned. Normally, when the funds buy a company they remove it from the stock exchange, and so there is no obligation to publish detailed data. The PE funds are active in all sectors of the economy, including private companies operating in public services, such as water, electricity and waste management. One category of funds, the so-called infrastructure funds, is of particular relevance to public service operations. These aim to invest specifically in network industries such as electricity, gas, water, telecoms, roads and airports, to give a steady return over a long period of time. There is also a global trend to reduce the use of equity finance in utilities and replace it with debt (Hall, 2006). These

two developments may, according to Hall (2006), have different implications from the activities of the private equity funds.

The private equity sector is dominated by a number of large firms, mainly based in the USA, but operating internationally. Compared with top US buyout groups, European private equity firms tend to be small and confined to national markets (Hall, 2006). PE firms use different types of funds for their investments. There are four main categories: venture capital, buy-outs, infrastructure funds, and hedge funds. Most PE firms have funds in a number of different categories, and so the same firm may operate venture capital, buyout, and infrastructure funds (Hall, 2006). In the 1990s Macquarie pioneered capitalising on capital flows from Australia's pension schemes, known as superannuation funds, and set up infrastructure funds, many of which were publicly traded entities (Tenorio and Idzelis, 2009).

Charting the risk-return profile for infrastructure and setting benchmarks remains work in progress. In general, Brownfield investments with well-established cash flow tend to produce the lowest returns, with a target internal rate of return of about 10% to 12% in OECD countries. Depending on how much capital is invested, rehabilitated Brownfield assets – those that are built but that may need capital improvements or expansion – may offer 15% returns. For Greenfields, or projects that need to be built, investors may hope for returns of 18% to 20% because they take on design, construction and operating risk. Most private infrastructure funds appear to have multiple investment targets, typically a combination of Brownfield, Greenfields and secondary investments (Tenorio and Idzelis, 2009).

The PE firms are less active in developing countries and as late as 2005 they failed to make adequate profits, with an average return of only 3% in developing countries (compared with nearly 14% in the US and 11% in Europe). PE firms invested $10.5 billion in Asia in 2005. Some made profits: Warburg Pincus made a return of nearly four times its original investment of $300 million in the Indian company Bahti; Carlyle made a return of over three times its investment of $171 million in Taiwan Broadband, which it sold on to Macquarie for $888 million in 2005. By comparison, PE firms invested only $1 billion in Latin America and nothing at all in Africa, the Middle East, or the CIS. A survey indicated that PE firms would expect returns of 26% before investing in Africa (Hall, 2006).

Infrastructure is only now emerging as a distinct asset class. For pension funds, it could be a useful way to match long-term funding liabilities with long-term cash flows that infrastructure assets tend to generate. Most private infrastructure funds are sponsored by large financial institutions through their investment banking units. The biggest single investors in European PE funds are banks and pension funds, followed by insurance companies. These three groups accounted for two-thirds of all money invested in PE funds in 2005 (Hall, 2006). A number of investment banks facilitate financing in infrastructure. While it is difficult to obtain a complete picture of what they are doing, as many investment banks decline to comment on their activities, the remaining part of this section includes a few examples.

Goldman Sachs: Goldman Sachs completed the first bank-sponsored fund in the US in 2006, raising $6.5 billion, of which $750 million came from the investment bank. It is now campaigning for a successor fund, which industry reports say is capped at $7.5 billion, though one source says the actual target is well below that mark. Its first fund was used for the $22 billion leveraged buyout of oil pipeline company Kinder Morgan Inc. and to purchase seaport facilities operator Associated British Ports Holdings plc, which a Goldman-led group bought for £2.8 billion in 2006 (Tenorio and Idzelis, 2009).

Standard Chartered Bank: A team of infrastructure professionals in Standard Chartered PLC focuses on making investments in infrastructure across Asia and managing the jointly-sponsored Standard Chartered IL&FS (Infrastructure Leasing and Financial Services) Asia Infrastructure Growth Fund. The fund takes an active management approach to investing in a portfolio of investments in the Asian infrastructure sector. The fund will have a primary focus on the rapidly growing Chinese and Indian markets where the combined requirement for infrastructure investment over the next five years is projected to be in excess of $1 trillion (SCB, 2011).

Barclays Bank: The Barclays Private Equity (BPE) division of Barclays Capital, the Investment Banking arm of Barclays plc, has an infrastructure investment arm with around £1.2 billion (€1.37 billion) under management, generating yields from over 84 concession-based projects with life spans of up to 25 years. BPE is one of Europe's leading mid-market PE investors. BPE has an infrastructure team of 12 investment professionals based in London. This specialist team invests in infrastructure projects sponsored predominantly under the Government's Private Finance Initiative and PPP. From the launch of the first infrastructure fund in 1997, BPE has raised in excess of £1 billion across five dedicated infrastructure funds. The five funds cover the primary market for the development of new infrastructure, and the secondary market for investment in operational infrastructure assets. Barclays Infrastructure Funds was established in 1996 and invests in social infrastructure to enhance public sector services in the countries in which it operates at a national and local level. The regions include EMEA; Asia Pacific and the Americas.

Nomura Holdings Inc: The Nomura group addresses infrastructure development challenges around the world through the core financial business of the group. In 2010

Nomura Holdings Inc's Nomura Securities established a fund to invest in infrastructure-development projects outside Japan. The fund will seek 100 billion yen ($1.1 billion) and invest in nuclear, railroad and other projects. In June 2010, Nomura Securities Co. ltd announced an operational collaboration with Nippon Export and Investment Insurance (NEXI) to establish infrastructure funds in Asia and other regions using trade insurance. In response to the recent expanding demand in emerging countries for infrastructure funding, Nomura Securities Co. ltd is considering the solicitation of investments from pension funds as well as institutional investors and others to support infrastructure projects. Through an operational collaboration with NEXI, Nomura plans to reduce country risk by using trade insurance and encouraging investments by pension funds and institutional investors and others who generally seek long-term investments from infrastructure projects that require long-term funding (Nomura, 2010).

Sovereign Wealth Funds and emerging powers

The Sovereign Wealth Funds (SWFs) present significant development potential to bolster Africa's investment shortfall (OECD, 2008; UNCTAD, 2008).

The role of SWFs in global financial markets has been growing, as part of a larger process of accumulation of foreign exchange assets by developing countries, which also includes the large accumulation of foreign exchange reserves. This reflects both booming exports and other capital flows (Griffith-Jones and Ocampo, 2008).

Based on IMF data, between December 2001 and October 2007 global reserves tripled, from $2.1 trillion to $6.2 trillion. The developing countries as a whole accounted for more than 80% of global reserve accumulation during this period, and their reserves approached $5 trillion. The growth in reserves has been steeper during the last few years. Export-led Asian economies, particularly China and India, and commodity-producing countries, especially oil-exporting countries based in the Middle East, have accumulated the lion's share of these increases (ibid.).

Official holdings managed by SWFs are difficult to estimate because of limitations of information. In some cases there may also be double counting. However, according to research by Morgan Stanley and Standard Chartered, SWFs across the world are thought to have about $3 trillion of international assets under management, that is, a sum equivalent to 50% of official reserve holdings. This compares with an estimated $500 billion in 1990. These SWFs assets are on the whole additional to foreign exchange reserves (Griffith-Jones and Ocampo, 2008). Some examples of SWFs are the Abu Dhabi Investment Authority, China Investment Corporation, Kuwait Investment Authority, GPFG Norway (the Norwegian Government Pension Fund) and GIC (Government Investment Corporation) fund from Singapore (UNCTAD, 2008; OECD, 2008).

Another reason for the growing role of SWFs in the international financial architecture is that their role has been confirmed by the global financial liquidity crisis. SWFs enjoy substantial freedom in selecting the assets that they deem appropriate for investing. The asset classes in which SWFs invest are far broader than those managed by central banks, including public and private debt securities, equity, private equity, real estate and alternatives. Their investment horizon can be considered as long term, whereas purely speculative elements are not seen as playing a dominant role in their investment strategies. On average, SWF asset allocation is split between fixed income securities (35-49%), equity securities in listed corporations (50-55%) and the remaining (8-10%) in alternative investments such as hedge funds, private equity or other products (OECD, 2008).

The potential for SWF investment in infrastructure is considerable. The current diversification trend seen across a number of funds is an indicator that they will look to allocate resources to non-traditional or alternatives assets, infrastructure in particular. Infrastructure investment fits well with the long-term, higher-return perspective of these funds. Indeed, alternatives are likely to experience the largest allocation increase. SWFs currently hold $270-340 billion in alternatives, and their share is expected to rise from 10% to 17%.

It has been estimated that annual world infrastructure investments range up to between $22 trillion and $50 trillion, making the sector comparable only to global equities ($30 trillion). In addition, during economic turmoil, infrastructure investment is also a counter-cyclical spending tool for some governments, who increase public spending during these periods (OECD, 2008).

China's new model: commodities-for-infrastructure concessional financing: A different capital risk model is being constructed that is more answerable to political stakeholders pursuing a defined national interest. The concessional finance model as implemented by China's state-owned (policy) Export-Import (EXIM) Bank according to Davies (2010) channels the bulk of Chinese capital being deployed in Africa. Key countries in Africa have been recipients of EXIM Bank's concessional financing, some of them ineligible for funding from traditional DFIs (Davies, 2010).

The EXIM Bank also finances investment projects – financing that is extended to Chinese SOE companies investing in oil and gas, mining, infrastructure and telecom projects abroad. The Bank's financing arrangement that ties a commodity off-take agreement with the provision of infrastructure in the contracting African country is commonly referred to as the 'Angola

Model'. The EXIM Bank's first such major deal was concluded with Angola's Ministry of Finance in March 2004 when the first $2 billion financing package was agreed. A total loan of $4.5 billion is providing Angola with the reconstruction of vital infrastructure whilst guaranteeing a minimum daily supply of oil to China's national oil corporation (Sinopec) in a joint venture arrangement with Angola's Sonangol.

China's developmental finance approach, with its higher tolerance (due to its political underpinning) of investment risk than traditional funding mechanisms, is increasing its appeal to African states over models that may not always cater for the developmental needs of resource rich but developmentally poor African economies. According to the World Bank, China provided $4.5 billion in 2007 for infrastructure projects. This is a major increase from the $1 billion provided each year from 2001 to 2003, but is down from a peak of $7 billion in 2007. It is reported that the EXIM Bank alone financed more than the combined total investment from ODA and PPI in the African power sector between 2001 and 2006, according to a survey carried out by the IMF (Davies, 2010).

Moreover, at the MDG Summit in September 2010 the China Development Bank explained that it has $600 billion of assets and plans to boost its Africa portfolio. It is China's intention to work not only with national governments but also with IFIs to get the job done. According to Sachs (2010), therefore, bridging Africa's financing gap for regional roads, rail, power, and fibre optic grids seem quite feasible.

The role of the G-20 in infrastructure development

In Toronto in June 2010, G-20 leaders committed themselves to narrowing the development gap and established a Development Working Group under the co-chairmanship of Korea and South Africa. The G-20 prepared multi-year action plans on inclusive growth which were adopted at the Seoul Summit in November 2010 (Draper et al., 2010).

Unlike the G-8, the G-20's focus is on 'beyond aid' issues. The G-20 operates the G-20 framework for strong, sustainable and balanced growth, in which African growth can play a role (e.g. it can inject capital arising through surplus reserves in profitable opportunities into sustainable infrastructure).

Winters et al. (2010) believe that international coordination on cross border regional infrastructure programmes is necessary and in many cases will be highly productive. G-20 members may be able to help LICs to achieve such cooperation. Members could, however, contribute in subsidiary ways and the G-20 could play a role in their coordination. Contributions could include: reviewing the guidelines for multilateral DFIs' infrastructure investment and the adequacy of their capital; encouraging SWFs to consider infrastructure investments in LICs; supporting the design and implementation of regional infrastructure initiatives; and assistance on infrastructure governance and regulation (Winters et al., 2010).

Draper et al. (2010) suggest that African economic development should be seen as central to the G-20 objectives, suggesting the following for the G-20 Summit in Seoul in November 2010:

- Consider looking at the financing of infrastructure in more detail. The G-20 could eliminate inefficiencies in the financing of infrastructure projects to free up significant resources that would reduce the need for additional funding in the short term. Initiatives like the African Financing Partnership, a collaborative co-financing platform amongst DFIs active in private sector project financing in Africa, could be supported.
- Enable DFIs to step up activities in African infrastructure, especially regional infrastructure, with an eye to leveraging (i.e. investing with borrowed money) G-20 outward FDI and sovereign wealth.

The G-20 has recently formed a high-level infrastructure panel (HLP), tasked to report back to the G-20 meeting in Cannes in November 2011.

Infrastructure financing: future issues

Infrastructure is key for growth and development. However, the financing gap remains large, despite increases in infrastructure funding. A major challenge is how the international community can find the necessary resources for infrastructure development to achieve the MDGs by complementing what is currently feasible through the ODA channel. This is particularly challenging in the light of the the on-going public finance crisis amongst the OECD-DAC donors.

The shift in economic power towards the emerging market economies (i.e. 'shifting wealth') has intensified South-South aid and investment flows, which may contribute significantly to meeting the unmet investment needs for the economic infrastructure sectors. However, widening the circle of aid donors beyond the non-DAC donors is going to take too much time to achieve the MDGs by 2015. Because time is of the essence it is necessary to consider new sources of infrastructure funding by scoping out the new infrastructure landscape.

This note considered traditional bilateral and multilateral donors, DFIs, private investors, investment banks, SWFs and emerging powers.

Going forward, there are a number of unanswered questions, such as:

- What would a comprehensive and consistent

mapping look like in the context of different international sources of infrastructure finance by region and country?
- What are the key constraints to unlocking new sources of infrastructure finance for development beyond aid?
- How can donors best use their grant funding to leverage in loans and other finance?
- How can approaches by DFIs best be used to promote private infrastructure finance?
- How can donors incentivise infrastructure investments that are sustainable and high impact in terms of social and economic effects?
- What does the role of infrastructure finance by emerging market economies mean for traditional donors and other financiers?
- How can SWFs be encouraged to take opportunities in African infrastructure more seriously?
- How should Africa embrace China as a new large-scale infrastructure financier?

Written by Christian Kingombe, ODI Research Officer (c.kingombe@odi.org.uk). This paper benefited from useful comments and insights from Alice Sindzingre, external referee, and Dirk Willem te Velde. Financial support for this research has been received from ODI's Growth programme.

References

AfDB and OECD (2009) *African Economic Outlook Report: Innovation and ICT in Africa*. Paris: OECD.

Atkinson, A.B. (ed.) (2005) *New Sources of Development Finance*. Oxford: Nuffield College, Oxford University.

Bayliss, K. (2009) *Private sector participation in African infrastructure: Is it worth the risk?* Working Paper 55. London: SOAS.

Commission on Growth and Development (2008) *The Growth Report: Strategies for Sustained Growth and Inclusive Development.* Washington, DC: World Bank.

Davies, M. (2010) 'How China is influencing Africa's Development'. Background Paper for the Perspectives on Global Development 2010 Shifting Wealth. Paris: OECD.

Devarajan, S. (2010) 'What's infrastructure got to do with it?'. World Bank Blog, 22 September.

Draper, P., Grant, C., Kingombe, C. and te Velde, D.W. (2010) 'The G-20 and African Development'. ONE Campaign Paper by SAIIA and ODI.

Estache, A. (2008) 'Infrastructure and Development: A survey of Recent and Upcoming Issues', in F.Bourguignon and B.Pleskovic (eds) *Rethinking Infrastructure for Development.* Washington, DC: World Bank.

Estache, A. (2006) 'Africa's infrastructure: challenges and opportunities'. Paper presented at 'Realizing the Potential for Profitable Investment in Africa'.

Fay, M. and Yepes,T. (2003) *Investing in Infrastructure: What is Needed From 2000 to 2010?* Policy Research Working Paper 3102. Washington, DC: World Bank.

Foster, V. (2008) *Africa infrastructure country diagnostic. Overhauling the Engine of Growth: Infrastructure in Africa*. Washington, DC: World Bank.

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

Goldstein, A. and Kauffmann, C. (2006) 'Is More Money Enough to Fix Africa's Transport Infrastructure?'. OECD Development Centre Policy Insights 21. Paris: OECD.

Griffith-Jones, S. and Ocampo, J.A. (2008) 'Sovereign wealth funds: A developing country perspective'. Paper presented at Sovereign Wealth Funds workshop, 18 February, London.

Hall, D. (2006) *Private equity and infrastructure funds in public services and utilities*. Discussion paper. London: University of Greenwich.

Izaguirre, A.K. and Perard, E. (2010a) 'Private activity in energy reaches a record high'. PPI data update note 40. Washington, DC: World Bank.

Izaguirre, A.K. and Perard, E. (2010b) 'Private activity in water and sewerage declines for second consecutive year'. PPI data update note 37. Washington, DC: World Bank.

Kingombe, C., Massa, I. and te Velde, D.W. (2011) 'Comparing Development Finance Institutions Literature Review'. London: ODI.

OECD (2009) *Africa - mobilising financial resources - boosting energy investment and carbon finance.* Paris: OECD-NEPAD Initiative.

OECD (2008) *Investment in Transport Infrastructure.* Paris: OECD-NEPAD Initiative.

OECD/AfDB (2007) *African Economic Outlook 2007: Access to Drinking Water and Sanitation in Africa.* Paris: OECD.

OECD/AfDB (2006) *African Economic Outlook 2005/2006. Promoting and financing transport infrastructure.* Paris: OECD.

OECD/AfDB (2004) *African Economic Outlook 2003/2004. Energy Supply and Poverty. Paris: OECD.*

O'Neill, P. (2011) *The Story behind 50 Years of Transport Investment in the Poorest Countries*. Washington, DC: World Bank.

O'Neill, P., Park, S. and Ahmedov, H. (2010) '50 Years of IDA Assistance to Transport Period: FY 1961-2010'. World Bank Blog.

Sachs, J. (2010) 'China has left the west on the sidelines in Africa?', FT.com, 22 September.

Tenorio, V. and Idzelis, C. (2009) 'Can private equity play the infrastructure game?' The Deal Magazine.

UN (2005) Resolution adopted by the General Assembly. 2005 World Summit Outcome. Sixtieth Session.

UNCTAD (2008) *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge.* New York: UNCTAD.

Winters, L.A., Lim, W., Hanmer, L. and Augustin, S. (2010) Economic growth in low income countries: How the G20 can help to raise and sustain it? Working Paper 8-2010. Brighton: University of Sussex, Economics Department.

World Bank (2010) 'PPI data update note 38', September. Washington, DC: World Bank.

World Bank (2004) *Reforming Infrastructure: Privatization, Regulation, and Competition.* Oxford: OUP.

Overseas Development Institute, 111 Westminster Bridge Road, London SE1 7JD, Tel: +44 (0)20 7922 0300, Email: publications@odi.org.uk. This and other ODI Background Notes are available from www.odi.org.uk.

 ISSN 1756-7610.