



**REALIZING THE POTENTIAL FOR PROFITABLE INVESTMENT IN AFRICA**  
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**Africa's infrastructure:  
challenges and opportunities**

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# **Africa's infrastructure: challenges and opportunities<sup>1</sup>**

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<sup>1</sup> This paper is based on a recent much longer paper: Estache, A. (2005), "How much do we know about Sub-Saharan Africa's infrastructure and the Impacts of its 1990 reforms?", Paper presented at the Cape Town Conference on Conference on Private Participation in Infrastructure, Economic Growth, and the Poor in Africa , June 2005. This paper reflects my personal views and none of the facts or assessments provided should be attributed to the World Bank , any of its affiliated institutions or any of its board members or member countries.

## 1. Introduction

1. The fact that Africa's infrastructure is central to its future is well understood by African policymakers. Energy, water, sanitation, telecoms and transport have long been mentioned by most heads of state in their speeches as essential concerns for which more resources are needed. Consultation processes reveal that these politicians are in tune with the poorest who also list access to better infrastructure services as critical to their quality of life.<sup>2</sup> The recognition of the importance of infrastructure was most recently collectively endorsed as part of the Commission for Africa report.

2. In spite of the political interest in infrastructure, until recently, during the 1990s, most of the academic and donors literature has tended to ignore infrastructure—with a few exceptions.<sup>3</sup> Human capital (health and education) mobilized the focus of researchers and donors alike. Water was part of the agenda because of its essential role in health—but mostly in that capacity. The importance of electricity, telecoms or transport for growth and hence poverty alleviation was largely ignored in the decisions to allocate public resources.

3. The MDGs formalized the central role of water and sanitation, and to some extent of telecoms, for most of Africa. The 2002 Johannesburg meetings set clear expectations for energy a little bit later.<sup>4</sup> Transport was essentially left out of the debate. Most surprising maybe is the fact that the concerns of the poor were not really addressed by the Poverty Reduction Strategy Papers (PRSPs) either—in spite of the MDGs. While these PRSPs (in their various evolving formats) managed to focus the international and local communities' attention on key development issues, they failed to give much credit to the central role of activities such as transport in achieving the MDGs. And yet, between 1960 and 2000, the correlation between average education levels of Africa's population and the various subsectors ranged from 0.51 (roads) to 0.70 (telecoms).<sup>5</sup>

4. More recent research now is now starting to confirm the politicians' and the poor's intuition. It shows that the relevance of infrastructure to growth and poverty alleviation is in fact quite analytically robust.<sup>6</sup> Whatever the approximation used for infrastructure, the econometric evidence shows that it influences positively either growth or growth convergence.<sup>7</sup> The strongest impact comes from the telecoms

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<sup>2</sup> See for instance, Narayan-Parker and Walton (2000), *Voices of the Poor*

<sup>3</sup> The NEPAD outputs, the Sachs papers, the Commission for Africa report, the 2005 Global Monitoring Report or the forthcoming OECD-DAC report on infrastructure for the poor, all offer estimates of these needs, at least at a fairly aggregate level. In that debate the linkages between infrastructure and growth are central.

<sup>4</sup> They did not however meet the expectations. SSA is likely to fall just short of meeting the water MDG—75% of coverage by 2015-- and is substantially behind on the sanitation MDG with 85% of SSA countries unlikely the MDG target of 66% of coverage.

<sup>5</sup> Correlation is a statistical measure of the degree to which two indicators are linearly related. This correlation measure can reflect direct or indirect causation but also a simple statistical oddity. In this context, however, the correlation is taken to be an initial indication of a link between education and infrastructure that deserves better scrutiny.

<sup>6</sup> For instance, see:

<sup>7</sup> For a recent overview of the research on growth in Africa, see Ndulu and O'Donnell (2005) or Ndulu (2004). The only papers covering infrastructure quantitatively are Easterly and Levine (1997), Esfani and Ramirez (2003),

sector, followed by roads and electricity. The evidence on the link of access to water or sanitation is more complex.<sup>8</sup> One of the latest studies shows that over the last 30 years, infrastructure investments accelerated the annual growth convergence rate by over 13% in the region.<sup>9</sup> The message is also strong on its relevance for agriculture. Diao et al (2003) for instance show that growth in African agriculture is critically constrained by high marketing costs in the region, largely due to high transport costs—as well as competition policy issues allowing excessive controls by intermediaries in the sectors. In that context, a recent IFPRI paper suggests that improving transportation infrastructure could increase agricultural income by as much as 10%.<sup>10</sup>

5. In addition to the few studies on the role of infrastructure on growth, there are many studies on its importance for trade.<sup>11</sup> Most of these studies find that the landlocked characteristic matters to growth and implicitly or explicitly argue that this increases the demand for transport services. They also confirm the Amjadi and Yeats (1995), Longo and Sekkat (2001) or Venables-Limao (2001) results showing that the lack of transport networks is hurting intra-regional and international trade.<sup>12</sup> In the context of Africa, there is also often an emphasis on the relevance of infrastructure for agricultural growth.

6. This brief survey points to a puzzling paradox. While politicians seem to have long been ahead of the academics and many donors in recognizing the relevance of infrastructure for growth and poverty alleviation, they ended up allocating a declining level of resources, both in absolute and relative terms to the sector during the 1990s. This paradox has a few rational explanations.

7. The main purpose of this paper is to review these explanations and the evidence on the sources of the decline of this allocation. It discusses the central role that the private sector was expected to play, the unmet expectations but also the sense that this partnership is unavoidable—another paradox maybe. The paper concludes with a discussion of the need to identify new ways of implementing these partnerships with an emphasis on the need for pragmatism. The main focus of the paper is on the implications of the failures of the 1990s for the poor, defining this concern as one of the main challenges for the next decade of reforms as countries try to get to the MDGs.

8. The paper is organized as follows. Section 2 discusses how the infrastructure gap came about. Section 3 documents the service access rates as well as

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Calderon and Serven (2004) and Estache, Speciale and Veredas. (2005). Many other mention infrastructure as an important variable but don't model it.

<sup>8</sup> This is probably because this sector has the highest correlation with health or education as well as with the other subsectors.

<sup>9</sup> See Estache, Speciale and Veredas (2005) who compare the relevance of infrastructure stocks in an augmented Solow model with and without human capital variables. There are also a few studies looking at the importance of being landlocked for a country. They are reviewed in Ndulu (2004)

<sup>10</sup> Abdulai, Diao and Johnson (2005),

<sup>11</sup> See Ndulu (2004) for a recent survey

<sup>12</sup> Sachs and Warner (1997) were among the most vocal to argue the relevance of this variable initially. See Ndulu (2004) for a survey; one exception not covered by Ndulu's survey is Naude and Krugell (2003) who find no evidence for the role of geography once institutions are taken into account

the affordability of infrastructure services in Africa. Section 4 covers the issues of service quality. Section 5 looks at the experience with reform so far. Section 6 concludes with some ideas of the opportunities available to ensure the fast, cost effective and affordable increase in infrastructure services needed to allow Africa to get to much needed high yet fairly distributed growth rates.

## 2. The infrastructure gaps and their sources

9. Africa's infrastructure stocks inherited from the colonial powers supported reasonably strong economic growth from the early 1960s until the 1970s oil shocks.<sup>13</sup> Between then and the mid-1990s, a long economic slow down, combined with growing interest in regional trade and other economic agreements catalyzed change in Africa's economic structure.<sup>14</sup> The fast, steady and continuous growth in household demand for infrastructure stemming from Africa's high population growth and the fast increase in the urbanization rates of these populations contributed to fuel the demand independently of all the changes on the production structure of the economy.<sup>15</sup> These changes led to a growing mismatch between the demand and the supply for infrastructure in the region. By the end of the 1990s, the gap had grown so significantly that some estimates suggest that to meet the Millennium Development Goals (MDGs), the average annual infrastructure expenditures in Africa (the sum of investment and maintenance expenditures) need to be around 9% of GDP between 2005 to 2015—see box 1 for some more specific data. This is much more than twice what Africa has spent on the sector over the last 40 years or so.<sup>16</sup>

10. The mismatch between demand and supply was amplified by the recurrent fiscal crises that accompanied the various economic crises. The policy responses to these fiscal crises, in particular from the mid-1980s onward, were often based on public expenditure adjustments set to address short term fiscal concerns. This may not have been the optimal policy in a continent in which the long term growth requirements needed a much more careful look at the relevance of the fiscal composition. These adjustments were too often blind to the sectoral allocations needed to support growth. They were also blind to the complementarity between expenditure categories within sectors—the commitment to maintenance is a condition to ensure the cost effectiveness of most investment decisions in infrastructure—which is characterized by potentially much longer lived assets than other sectors.<sup>17</sup> The upshot is that fiscal shortfalls and/or cuts led to under-maintenance and under-investment across infrastructure subsectors.

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<sup>13</sup> As pointed out by S. Brunel (2004), Africa's colonization dramatically modified the use of space in the region, shifting growth and urbanization from inland to the littoral.

<sup>14</sup> There is no country in Africa who is not a member of at least one of the 10 regional economic groupings!

<sup>15</sup> The urban population now represents 40% of the total, vs. 30% 25 years ago. This is about 300 million people

<sup>16</sup> Sachs and his colleagues talk about needs equivalent to 13% of GDP in their UN paper.

<sup>17</sup> The heated debates of governments—and often the Bank sector staff—with the IMF on Road Funds serves as a witness to the divergence of views on this topic. The debate is however on very solid concerns. According to Desmarchelier (2005), the ratio of actual to required maintenance in roads for a sample of averaged 42.4% and varied from 0.28% in DR Congo (in 2003) to 89.3% in Burkina Faso (2001). It was below 50% for 6 of the countries.

**Box 1: Africa needs US\$40 billion a year for 10 years to reach the MDGs.**

According to the 2005 Global Monitoring Report, if Africa is to meet the key MDGs by 2015, the region needs average growth rates of over 7% for the next 10 years or so.<sup>18</sup> The table below in this box shows that the estimated associated infrastructure expenditure requirements are of about 9% of GDP. This is, of course, only a rough order of magnitude but they are quite useful in getting sense of the challenge ahead.

**Africa's expenditure needs to meet the MDGs  
(% of GDP - 2005-2015)**

Needs	Electricity	Telecoms	Roads	Rail	Water	Sanitation	Total
<b>Investment</b>	1.2%	0.7%	2.2%	0.0%	0.4%	0.6%	5.1%
<b>Operation and Maintenance</b>	0.7%	0.5%	1.7%	0.2%	0.3%	0.5%	3.9%
<b>Total expenditure</b>	1.9%	1.2%	3.9%	0.2%	0.7%	1.1%	9.0%

In dollar terms, this total represents average annual investment needs of about US\$22-24 billion for the next 10 years, with a peak in the 2005-2010 period if the MDGs are to be met—that is if growth rates are at 7%/year over the next 10 years or so; if growth rates are closer to about 5%, the 5.1% of GDP investment needs only represent US\$17 billion/year. That's about US\$31 per capita per year, 8.5cts/day/capita. Adding annual operation and maintenance needs of US\$17-18 billion results in annual expenditure needs of about US\$40 billion between 2005 and 2015. Note that these figures ignore the needs in the port and airport sector and most importantly leave out irrigation. It may also ignore some of important large regional projects. The estimated total needs, including needs for regional projects, conducted by NEPAD in 2002 for its Infrastructure short term action plan for the whole of Africa (NEPAD 2002), are around US\$64 billion for the next 10-15 years. This estimate included about US\$8.1 billion in needs to finance 20 top priority regional projects. Transport projects aiming at promoting the regional integration of the continent counts for 25% of these needs. The African Development Bank adds US\$4 billion needed to complete the Trans African Highway.

11. The inefficiency of many of the public enterprises responsible for the delivery of infrastructure services did nothing to help the fiscal situation. Instead, they contributed to inflate costs, hence increasing the severity of the budget constraints and ultimately the infrastructure gaps. The excessively mis-targeted policies aimed at addressing the sector's problem during most of the 1980s and the early part of the 1990s were counter-productive in many more ways—too many to cover them here.<sup>19</sup> Some of these actually further fueled the fiscal problem they were trying to address and contributed to the erosion of a potential tax base expansion much needed to finance the increasing capital and recurrent expenditure required by this sector and others.

12. Africa's original fiscal space problem was thus initially the outcome of a sequence of misguided public policies. Early on, the sector's resources were

<sup>18</sup> To be precise, the estimates based on a sample of 28 countries for which the required data on poverty is available suggests that a population weighted average growth per capita needed to achieve the MDGs is 5.2%. More than half of the countries in the sample need per capita growth rates of over 6%.

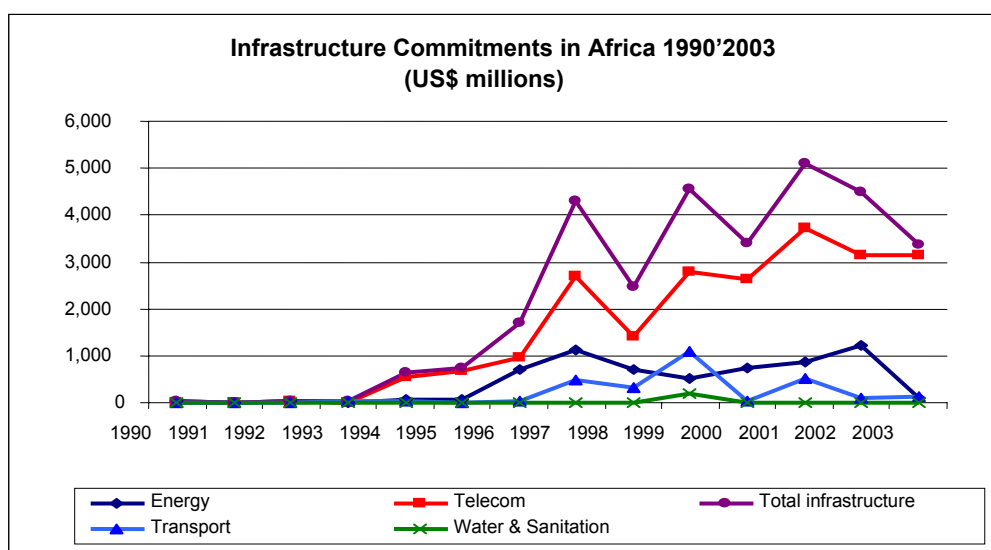
<sup>19</sup> For an overview, see the World Bank 1994 World Development Report on infrastructure.

essentially wasted, next the resources were excessively rationed with the hope of achieving efficiency. The second half of the 1990s saw a third stage in which resources were further rationed under the hope that private sector financing would replace public sector financing--while addressing the public sector inefficiency problem. At most 10-15% of the investments made during the 1990s can be credited to private investors. This is not negligible but it is not significant enough to cover the reductions associated with the fiscal adjustments. The simple fact is that the unrealized hopes of the 1990s have unfortunately contributed to ration infrastructure investment and quality. Box 2 provided an indication of the commitments made by the private sector in Africa's infrastructure.

### Box 2: Private commitments to contribute to the financing of Africa's infrastructure investment needs

Based on the information available on private sector commitments since 1984, the private sector allocated about US\$ 1.4 billion on an annual basis over the last 18 years or so—this refers to foreign private sector but it is the only data we have on private sector participation. These commitments were actually US\$1.8 billion over the last 5 years. This suggests that the private sector contributed at most 15% if all commitments were disbursed. It is likely that the private contribution to these investments is closer to 10%. This is significant but it would have to be increased significantly to contribute in any major way to the financing needs of the continent. To mitigate somewhat this conclusion, it may be worth pointing out that it is based on the fact that we do not know the actual economic importance of the domestic private sector. There is plenty of anecdotal evidence on their importance in delivering where no-one else does.

The evolution of this mostly foreign investment commitments over time shown below is also interesting. It shows that Africa peaked in 2001, about two-three years later than most other regions, but that it has followed a downward trend since in all sectors but telecoms. Over an almost 20 years period, Africa has only managed to generate 230 projects in partnership with foreign operators and about 50% of the money has been committed to a single country: South Africa! Even ignoring the South African bias of the data, the total number of projects is small and so is the average size of projects in Africa. The average project size is indeed less than 50% of the average size for developing countries. In most sectors, Africa's share of total (mostly foreign) private investment attracted by infrastructure in the developing world is roughly 1-2% (except in telecoms, 6%).



13. If government had not internalized the hope of increased private sector financing of infrastructure, Africa's infrastructure problems may not have been as dramatic. But most governments cut the resources allocated to infrastructure before there was any evidence of significant private sector disbursements. This observation is based on the evidence we have on the evolution of the physical stocks which have traditionally been financed by the public sector. This is because the sectoral decomposition of public expenditures is not really well measured in many countries. These days, public expenditure reviews are process oriented, not really focused on finding out how much is spent on what. As a result, there is no reliable data source on the level of expenditure in the various infrastructure subsectors.

14. To get a sense of the total level of expenditure by the public sector—i.e. government + public enterprises-- in infrastructure, the only quick approach possible is an assessment of the changes in infrastructure stock levels as mentioned earlier. Since the private sector financed 10% of the investments, about 90% of these changes must have been financed by the public sector. According to this approach, the government and the public enterprises spent at most 3-4% of its GDP during the 1990s. This is about US\$8-8.5 billion/year. This figure establishes the baseline from which the increased government commitments to the sector will be assessed. It is unfortunate that it has to be estimated in such a rough way, in light of the importance of this baseline in assessing the effectiveness of the changes the international community is trying to obtain in the sector.

15. Because the quality of the data, in particular the data on quality, is so unsatisfactory, it is important to recognize that the conclusions delivered by this paper are preliminary. As more and better data becomes available, this preliminary diagnostic is likely to be refined. But for now, this "macroeconomic" picture seems to be robust enough to generate some concerns among policymakers. Esfahani & Ramírez (2003) estimated that if Africa had had East Asia's growth rate in telephones per capita (10% vs. 5%) and in electricity generation (6% vs. 2%), its per capita growth rate would have been at least 0.9% higher. Calderon & Servén (2004), relying on a synthetic indicator of infrastructure services and generating counterfactuals suggest that if Africa had enjoyed South Korea's infrastructure capital stock, its average growth rate between 1996 and 2000 would have been 1.04% points higher than observed. These sort of estimates imply that Africa's infrastructure gap was not a minor policy failure.

### **3. How should Africa's needs be financed?**

16. Considering the information provided by Box 1 on needs and section 2 on current levels of expenditures in the sector, very roughly, Africa needs to double the resources it is allocating to the sector. How could it finance such a big increase?

17. There are two ways of looking at the financing of these needs: ex-ante and ex-post. Most of the sector specific literature and policy discussion tends to take an



ex-post perspective. This ex-post approach focuses on how the providers recover their costs, i.e. the distribution of financing responsibilities between users (i.e. direct cost recovery) and today's tax payers (subsidies from the state) or tomorrow's taxpayers (if the government contracts loans). The ex-ante approach looks at financing from a more macroeconomic perspective. The debate is on the distribution of financing between the taxpayers and the operator. When the operator is public, in general, the financing takes place through a budget transfer--hence today's taxpayers pre-finance the users—or through loans—from donors or private sources. When the operator is private, it pre-finances the user mostly from equity or borrowing/bonds—which is of course recovered through tariff and subsidies ex-post. For now, I focus on the ex-ante concerns of macro-policymakers—we address the ex-post view, including the importance of cost recovery from a financing as well as from an efficiency and equity viewpoint, later in the discussion of the affordability of the service.<sup>20</sup>

18. For many African countries, multilateral development banks (MLB) provide one of the main sources of financing for their infrastructure. The MLB lend money at a margin over the 6 month LIBOR (London Interbank Offer Rate). As of July 15, 2004, taking account of commitment fees and front-end fees, the equivalent interest spreads varied from 35 basis points (ADB) to 154 basis points (EBRD). The World Bank and the African Development Bank, the main sources of funding for Africa, were in the range of 44 to 57 basis points. At that time the 6-month LIBOR for US dollar loans stood at 1.86%. So, for example, the effective interest rate for a US dollar variable spread loan from IBRD was 2.3% (=1.86% + 0.44%)

19. These loans have to be reimbursed at some point and it is essential to adjust those rates to the social cost of borrowing from multilaterals at a concessional rate—which essentially consists in adjusting in net present value terms for the cost of public funds which account for the welfare losses associated with country specific tax distortions.<sup>21</sup> According to Warlters and Auriol (2005) estimates, by borrowing \$1 from IDA, the Government of Kenya imposes a social cost on the country of 6 cents. This is a very low social cost. It is low because IDA countries do not pay interest and have a long grace period, and Kenya's government has a high discount rate. At the other extreme, the social cost of South Africa's borrowing is higher than the other countries because it pays interest, has a shorter grace period and has a lower discount rate than the other African governments.

20. When concessional lending is not available and user fees are not relied upon, subsidies are the most common form of financing. The social cost of these subsidies is best approximated by estimates of the marginal cost of public funds (MCF). For a sample of 38 African countries, Warlters and Auriol (2005) find an average distortion of 17% which means that any public sector public expenditure,

<sup>20</sup> Cost recovery is indeed an issue. Based on the information from a sample for 27 water utilities collected by IBNET, the average recovery rate for operational expenditures between 1997 and 2002 was around 18.5%.

<sup>21</sup> The MCF measures the ratio of the additional welfare cost imposed on society as a result of a small change of tax rates, to the amount of additional tax revenue raised. Say that the MCF associated with a small simultaneous increase of several tax rates is 1.30. This means that if the government raises an additional dollar of tax revenue, consumers are worse off by not only the additional \$1 they have just paid in taxes, but also by 30 cents of welfare that is destroyed by the additional distortions of the economy. If the government simply gave the \$1 back to consumers as a transfer, consumers would be 30 cents worse off than they were before the tax and spend operation.

including investment and operation and maintenance of infrastructure, should have, on average, a minimum social rate of return 17% (with a spread going from 5% to 37% depending on the country since tax distortions vary significant across African countries).

21. When the cost of private financing is lower than the equivalent cost of public funds, it makes sense to try to rely on private sector financing. This is most likely to happen under two extreme cases. First, when the tax distortions are very significant—i.e. for countries with cost of public funds close to 37% in Warlters and Auriol' sample. It can also happen when country and project risks are very low and hence the cost of private funds are very low. According to two recent studies (Estache and Pinglo (2005) and Warlters and Auriol (2005)), this is seldom the case. In Warlter's and Auriol's sample, the cost of private funds across Africa ranges from 15% to 20% depending on the country and on the sector. It is only in Ethiopia, Mali and South Africa that public financing requires a higher rate of return than private financing for all sectors. Ethiopia and Mali have high distortions in their tax system while South Africa enjoys very competitive private sector financing terms. In most of the other countries, it is only for specific projects in any sector that it will be cost effective to rely on the private sector.<sup>22</sup>

22. The point is that, for most countries, as expected, if concessional loans are available, they are, in general, likely to be the cheapest source of funds available.<sup>23</sup> Hence, and ignoring for a moment the debt sustainability and the sector specific and total absorption capacity issues—see Box 3 for some thoughts on these limits--, when looking at this specific sector, it is in the interests of most African countries to borrow as much as possible from donors offering concessional rates.<sup>24</sup> The needs are however so large that once all concessional options have been cashed in and once the social limits of taxation have been reached, it is likely that there are many instance in which it will make sense to try to go for private sector financing as well. This is likely to be the more so the case, in countries characterized by significant distortions in their tax system.

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<sup>22</sup> This is why project finance is so attractive—it allows to identify the projects with low private costs--- but also dangerous because they may give an incentive to pick the cherries which have historically financed a sector, leaving the state to pay for the high costs activities without the opportunity to cross-subsidize within a sector.

<sup>23</sup> It is important to recognize that there are limits to this somewhat mechanical approach. The estimates provided here of the cost of public and private funds are rough approximations. Moreover, tax financing has its social and political limits—which is yet another argument in favor of well designed user fees. Finally, these ignores any difference in efficiency in expenditures between public and private providers of public services.

<sup>24</sup> There are of course specific projects and specific activities for which the private sector will be an ideal partner, but this statement must also be weighted against the possibility that these private project are associated with cream-skimming problems in which a profit center is amputated from a public sector business at a higher net fiscal cost. There is significant evidence of this in Latin America, see for instance Campos et al (2003).

### **Box 3: How much more aid can Africa absorb infrastructure?**

Although there is a lot of talk about Africa's needs, little concrete evidence is available on Africa's capacity to absorb any new massive inflow of aid in a specific sector—e.g. the doubling of resources to be allocated to infrastructure argued for by the Commission for Africa report. While the relevance of this concern will clearly vary across countries, any country specific assessment will have to look into two decision margins: (i) the macroeconomic limits—both short run and long run--; and (ii) institutional constraints. Of course, other dimensions may matter also,—including more political aspects or even distributional aspects as discussed by Bevan (2005) but they are at a second level.

***The macro limits to absorptive capacity.*** One of the first things Ministers of Finance and macroeconomists of the IFIs are likely to do when specific commitment figures and associated disbursement and repayments patterns will be known for every country, is to assess the fiscal sustainability of these new flows to finance infrastructure. In that context, the main challenge is that current public sector accounting and debt sustainability rules of thumb may be discriminating against infrastructure and in the process penalize growth. Under current fiscal rules, short term fiscal considerations tend to dominate longer term concerns.

These concerns distort the desirable allocation of resources in at least two ways. First, they favor sectors which generate quick positive cash flows. This penalizes many infrastructure investments which take 18 to 24 months before they generate any cash flow at all and are generally build to address demand forecast 15-10 years ahead of time. Accrual accounting rules would not generate these distortions. Second, by ignoring the fact that growth levels are driven by the composition of public expenditure and drive growth with a lag —consider the role of roads in agricultural growth--, these rules overstate the absorption capacity problem.

***The institutional limits to absorptive capacity.*** Among many observers, there is a concern with the managerial ability of the public sector administrations of many countries to deliver significantly higher levels of service at equal or improved levels of service quality. A related element is the concern with the risks associated with the impact of dramatic aid levels on the government capacity and incentive to generate domestic resources needed for the long run sustainability of the operation and maintenance of the sector. There are other more complex institutional elements that limit the full value of the usual fiscal calculus associated with the debates on absorption. These include the many incentives problems—political interference, corruption and other governance concerns—which contributed to the deterioration of the public provisions of infrastructure services since the mid-1970s. It is quite important not to forget that these incentive and fiscal problems were the main catalyzers of the search for alternative sectoral organizations and other reforms, including the search for more collaboration with the private sector—as discussed later in the paper in more details. The next wave of reforms cannot afford to ignore that a return to the pre-reform situation is likely to be an undesirable situation.

These institutional limits are also relevant to the assessment of the idea suggested by many participants in the debate on the financing of Africa's needs that aid in loans or grants may be the more cost effective solution to help Africa. Indeed, it is quite crucial to recognize at this stage that any scaled-up ODA flows and long term commitment will be require major changes in the ways the public sector does its business in infrastructure. The new environment requires an exceptional commitment to institutional changes by African countries and by the donors. It also requires a very concrete workable game plan to achieve improved governance, capacity and institutions. Indeed, there is a fundamental dilemma to address as part of the debate on how to meet Africa's financing needs. Once it is accepted that the public sector will be the main actor and that donors will have to scale up their commitments, everyone needs to accept that the dramatic scale-up in aid risks overwhelming fragile institutions. The ideal would that the efficiency and effectiveness of use of greater aid flows will improve the delivery of public services and be coordinated with the development of good institutions that increase the accountability of all the parties involved.

## 4. Africa's infrastructure challenges

23. The baseline information on the extent to which infrastructure is meeting the demand can be separated into residential and non residential demand. Besides the sense on nonresidential demand stemming from the growth models, there is also growing evidence from investment climate assessments being conducted throughout Africa. This evidence is briefly summarized below. As for residential demand, the MDGs may have given a strong sense of the challenge and of the urgency, but they have ignored some of the major concerns that influence the day to day life of the poorest. These concerns are also reviewed in this section.

### 4.1 The non-residential infrastructure needs

24. The African infrastructure market structure tends to differ from the one observed in other regions –e.g self reliance as a way of life to avoid rationing by unreliable public providers; areas too large to hope for dense networks, over 70% of rural clients, about 50% of poor clients. This complexity may hide the existence of an effective but frustrated demand and certainly hides the very high costs to the economy of forcing investors to aim at self reliance.

25. In a recent study on the topic, Lumbila (2005) shows that African countries with larger infrastructure stocks—unfortunately only approximated by telephone connections—see significantly more FDI and domestic investment than countries with low stock levels. Countries with more developed infrastructure see a disproportionately greater impact of infrastructure on FDI and domestic investment on growth. However, countries with lower, underdeveloped infrastructure see no statistically significant impact of infrastructure of investment on growth. This suggests that not only can a lack of infrastructure be an impediment to more investment, but it can also be one of the dimensions of the poverty trap argument since it seems that a critical mass of infrastructure is needed to convince investors to make the decisions leading to growth.

26. In a nutshell, this implies is that infrastructure meets the investors' demand in Africa, as anywhere else, *but only after a threshold has been reached*. Because the majority of African countries have not yet accumulated a critical mass of infrastructure or a sufficient infrastructure platform, costly self sufficiency seems to be the norm to meet the demand of investors for infrastructure services.

27. The econometric lessons from the past seem to be confirmed by investors surveys of future needs collected as part of the Investment Climate Assessments (ICAs). One of the questionnaires sent to investors asks for their assessment of the general constraints to operation. In the 6 African country case studies available, electricity appears in the top 5 among 19 possible constraints. Transport and telecommunications tend to be ranked in the bottom third of the priorities. When asked which factors are major or very severe obstacles for the operation and growth of their business, 22% of the establishments surveyed responded telecoms, 25% transportation and 48% electricity. To put things in perspective, 40% of the establishments surveyed list corruption as a major or very severe obstacle.

28. These investment climates, to the extent that they rely mainly on foreign investors needs, introduce a bias in the diagnostic of the non-residential infrastructure needs. A recent paper by Moss et al (2005) analyzes the data collected on the difference between foreign and domestic investors in three East African countries (Uganda, Tanzania and Kenya). It reveals that foreign investors are systematically more concerned with electricity and transport than domestic investors. This is only anecdotal evidence but it is consistent with the traditional vision built-in the design of policies aimed at attracting foreign investors. More recent evidence should be available on the differences in demand from the large number of additional surveys to be conducted over the next 2-3 years.

29. From a strict policy viewpoint, three main lessons for Africa seem to emerge jointly from the econometric and survey evidence: (i) non-residential demand is not being met and energy seems to be at the top of the list of investor's concerns; (ii) there is an infrastructure stock level threshold required for foreign investors to start investing in non-natural resources related activities; (iii) while foreign and domestic investors share some concern with respect to infrastructure, their demand can be different and hence designing an infrastructure to cater to the foreign demand may leave some of the domestic demand unmet. *In other words, if the policy is to promote domestic investment—i.e. promoting small and medium corporations--, it may be worth conducting a differentiated assessment of infrastructure needs per investors' type to assess the level and sources of differences. Not all infrastructure matter equally at all time to all investors.*

#### 4.2 The residential infrastructure needs

30. The best approximation of the residential demand for infrastructure is given by the access rate. For some indicators like water, sanitation and electricity, when access is not 100%, it seems reasonable to presume that the policy target is to eventually get it as close as possible to 100%. For telecoms it would be ideal to get a sense of the share of the population with access to a fixed or mobile phone. While that information is however not collected by household surveys on a systematic basis, there are reasonable alternatives. For transport the matter is much more complex. There are many debates as to what the appropriate policy approximation should be. Most of it is about how best to define the role of transport. Transport is a displacement between two standardized points in space—i.e. between home and school, the market or a clinic. The time it takes to move between these two locations in the most common transportation mode—i.e. walking--should be a reasonable approximation to access. It is however available for only very few countries and hence does not generate a good enough sense of access rates in the continent. The alternative is to rely instead on the very rough—and contested—approximation of the access to transport by a snapshot of the size of the road network.<sup>25</sup> The paper presents

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<sup>25</sup> The main problem with this indicator is that there is not objective sense of how much road coverage is ideal; the only thing that can be said is that there is too much or too little based on a benchmarking exercise but while

later some of the better indicators available for a smaller set of countries and, in some instances, for the various income classes. For now, Table 1 provides an overview of the best information available on Africa for the largest possible country coverage.

**Table 1: Access rates to the main infrastructure services in Africa**

	2002 unweighted averages (sample sizes are given in parenthesis)			
	Africa (48)	Low income (65)	Low middle income (52)	Upper middle income (38)
<b>Electricity access rates</b>				
% of total population <sup>(a)</sup>	14.9 (40)	30.7 (59)	81.8 (38)	87.2 (24)
% of rural households <sup>(b)</sup>	8.3 (25)	19.1 (34)	59.1 (11)	n.a.
% of urban households <sup>(b)</sup>	54.0 (25)	63.4 (34)	95.3 (10)	n.a.
<b>Water access rates</b>				
% of total population	64.1 (47)	64.8 (65)	85.4 (48)	92.8 (26)
% of rural population	53.9 (47)	55.9 (65)	76.0 (49)	85.3 (26)
% of urban population	82.6 (47)	82.9 (65)	94.3 (48)	95.6 (29)
<b>Sanitation access rates</b>				
% of total population	36.5 (46)	40.1 (65)	71.7 (48)	85.6 (23)
% of rural population	27.9 (47)	40.4 (65)	57.8 (49)	76.1 (25)
% of urban population	54.3 (46)	60.4 (65)	85.2 (48)	90.5 (26)
<b>Telecoms access rates</b>				
Telephone Subscribers/1000 people	89.7 (48)	50.9 (65)	250.3 (52)	578.3 (36)
Rural ownership of phones (% of households) <sup>(c)</sup>	0.7 (21)	2.4 (29)	9.4 (11)	n.a.
Urban ownership of phones (% of households) <sup>(c)</sup>	9.7 (21)	14.4 (29)	44.8 (11)	n.a.
<b>Transport access rates</b>				
Road km/1000 people <sup>(d)</sup>	3.5 (47)	3.0 (64)	4.96 (50)	9.2 (34)
Road km/1000 square km <sup>(d)</sup>	166 (47)	189 (64)	326.8 (50)	1083 (34)

Source: Based on data presented in Estache and Goicoechea (2004)

Notes: averages figures correspond to unweighted averages of data available.

(a) Data in 2000.

(b) Africa averages include 4 observations in 1997, 6 in 1998, 6 in 1999, 4 in 2000, 4 in 2001, and 1 in 2002.

(c) Africa averages include 1 observation in 1997, 4 in 1998, 5 in 1999, 2 in 2000, 4 in 2001, and 5 in 2002.

(d) Africa averages include 1 observation in 1997, 1 in 1998, 35 in 1999, 5 in 2000, and 5 in 2001.

31. Besides the infrastructure policy lessons to be drawn from this table, there are four process points that emerged from the preparation of this table. First, there is some disparity across sectors in country coverage. Electricity is the least well covered for all indicators. Second, there is disparity in the quality of the indicators available.

this information has some policy value—in particular when a country is far from having reached a critical mass of road stocks—, it cannot be used to drive specific investment decisions.

All of them, however, have their own set of problems. Transport is the weakest in terms of information available to approximate access. Water and electricity are equally problematic in terms of reliability. Its definition fails to recognize that water access 24 hours a day, 7 days a week is different from anything less. This means that the ideal indicator should have been adjusted for comparable service qualities. The electricity indicator is an estimate for some countries. The most reliable information comes from the household surveys discussed later but they are not available for enough countries. Third, except for water and sanitation where the data is actually for a single year (2002), for all other sectors, the data covered are for the latest year for every country. The details are provided in the footnote to Table 1. The data on total population and the data distinguishing urban and rural population is not strictly comparable because it comes from different sources—in the case of electricity and telecoms. The total data comes from various sources while the unbundled data comes from DHS in general which have a much lower coverage and focus on the low and some lower middle income groups only.

32. The main lessons that can be drawn from this very “bird-eye” snapshot can be summarized as follows:

- To state the obvious: *Africa’s non residential demand for infrastructure is not being met*; but this is not just about water or telecoms and other information services as implied by the MDGs; it is not just about rural electricity as implied by the Johannesburg supplement to the MDGs, it’s a much wider problem that cuts across sectors and concerns all populations and all sectors;
- *Africa’s worst sectoral performance is in terms of electricity access rates*, both in absolute terms and in comparison to its peer group; this is true for the total population but also for rural and urban populations
- *Africa’s worse off population in terms of access to modern infrastructure services is rural*; the gap between rural and urban infrastructure access rates is quite significant across sectors and tends to be larger in Africa than in other low income groups. It is largest for electricity and telecoms services.

Of course, these conclusions hide a very wide diversity of country specific experiences. But the purpose here is not to provide country specific assessments but to give a bird eye view of the collective challenge to be addressed by the global community of stakeholders in Africa’s future.

33. What the table does not show is that progress during the 1990s has been very different across sectors. Africa’s electricity access rates are the poorest performers with a significant deterioration in electrification rates relative to its peer group where access rates have grown much faster and a very high concentration of poor performers. At the other extreme, Africa’s telecoms sector has achieved the most impressive progress, although the bulk of the countries are still lagging the performance of lower and upper middle income countries. Africa’s water access rates as measured by WHO appear to have achieved a good progress during that decade. The region average has caught up with the low income country average; however, many of the countries have only hardly done better than population growth (i.e. those very close to the diagonal). Africa’s sanitation access rates did not progress as

successfully: many countries are in fact worse off now than they were 12 years earlier; Africa has in fact progressed worse on average than its peer group. Finally, Africa's transport access has deteriorated somewhat in absolute terms even if it has improved when compared to its peers—according to the weak approximation available.<sup>26</sup>

34. Not all countries have performed equally well or equally poorly. The top performers across sectors in our sample include Botswana and South Africa. However, Ghana, Mauritius, Namibia, Senegal and Zimbabwe are very close to belong to this group. The bottom performers defined as countries that have been able to be above the regional average in only one of the 4 sectors tracked down here include 20 countries! There is no single sector in which all poor performing countries tend to perform better collectively—although telecoms seem to enjoy the highest share.

35. Given the extreme poverty level observed in Africa, a fair concern is if the infrastructure needs of the poor and those of the higher income classes are addressed equally well. As in many other instances, this is not a policy area that tends to be addressed systematically by international databases. One option available to policymakers interested in cross-country comparisons is to rely on comparable household surveys. The best source of information based on these criteria is the Demographic and Health Surveys (DHS) for utilities and Living Standard Measurement Surveys (LSMSs) for transport. The DHSs provide information on access rates per quintiles to electricity and piped water in 26 Sub-Saharan African countries.<sup>27</sup> The LSMSs provide information on the time it takes to get to a school or to a hospital but only for a smaller set of countries (12).

36. Table 2 summarizes the information available. It shows that access rates to networked water and electricity very obviously exclude the poorest 40% of the population. Only 3 countries (SA, Cote d'Ivoire and Nigeria) have managed to do a much better job a distributing access across income classes. In a third of the sample, access in fact only concerns the richest 20% of the population. An explanation is that utilities tend to serve the capital city and the largest urban centers where the richest are likely to concentrate.<sup>28</sup>

37. For transport, there are also significant differences between income classes but not as dramatic, in particular, for access to primary schools. Moreover, the dispersion of experiences across countries is much narrower than for utilities.

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<sup>26</sup> The approximation is weak because being within 30 minutes of a school does not imply that children are actually going to school or that the transport infrastructure allows easy access to a clinic in case of emergency.

<sup>27</sup> The raw data needs to be subjected to a manipulation to generate a full welfare assessment. Indeed, since DHS data do not include information on consumption or income, the level of well being of each household is assessed from an index of wealth. The approach is described in Diallo and Wodon (2004)

<sup>28</sup> Relying on the WHO definition of water access, the story is less dramatic for the water sector since all income groups enjoy some access—although difference across income classes are still large



**Table 2: Summary of DHS information on average access rates in Africa**

	Quintiles				
	First	Second	Third	Fourth	Fifth
<b>Improved water sources</b> (% of population)	34%	49%	54%	67%	85%
<b>Piped Water</b> (% of population)	0%	1%	3%	11%	40%
<b>Network Electricity</b> (% of population)	0%	4%	12%	28%	71%
<b>Transport in terms of access to School</b> (% of population within 30 minutes of school)	62%	65%	66%	68%	72%
<b>Transport in terms of access to Health</b> (% of population within 30 minutes of a clinic)	56%	60%	70%	73%	79%

Source: Based on a sample of 26 countries for which data is provided by Diallo and Wodon (2004)

38. But the poor's problem is not only access, it is also affordability. Rules of thumb to assess affordability suggest that 5% of income should be the maximum the poor should spend on their water and sanitation needs—3.5 for water alone--, and another 4-5% on electricity. Overall, poor households should not have to spend more than 15% of their income on infrastructure services—5% on water and sanitation, 4-5% on energy and the rest on transport and telecoms. The data available has some limitations. It tends to focus on the expenditure on water and electricity of household connected to a network. Since in general, unit costs for non-network provisions tend to be higher, it may be reasonable to assume that these figures are lower bound for water and electricity expenditures—although because unit costs are higher for the non-connected users, consumption may also be lower.

39. Without being too specific, there is quite a bit of anecdotal evidence that Africa's poor spend more on infrastructure than other regions' poor. The poorest African income class tends to spend more than the ranges identified in other regions. For energy also, they spend on average 7.5% of their income. This suggests that tariff structures may not have paid enough attention to the ability to pay of the users. There is unfortunately no benchmark for transport but these numbers seem to be quite small in comparison to expenditure patterns observed in other regions where the poor may end up paying up to 20% of their income on transport services. This also reflects the very low rate of motorization, the use of alternative vehicles in the region or the very low mobility of the average African.

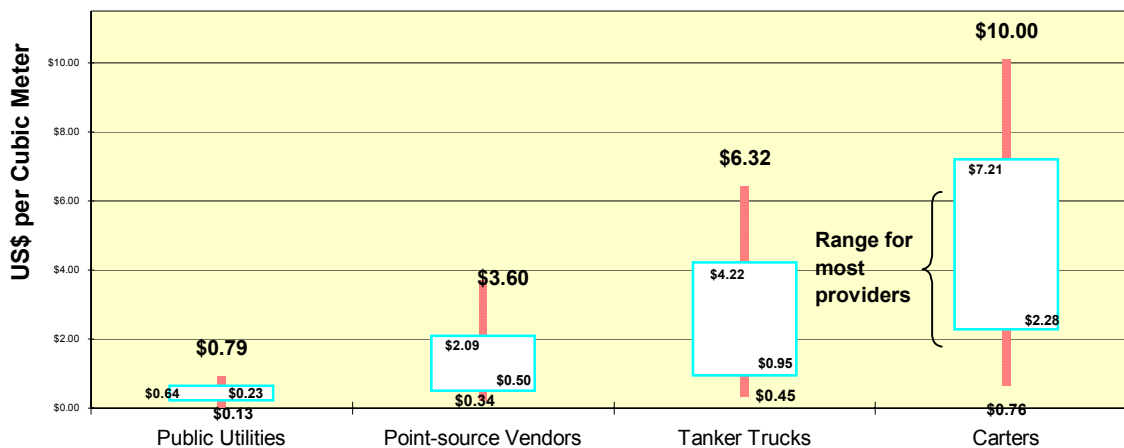
40. Part of Africa's problem is that cross-subsidies are certainly not what they used to be. Historically, one of the most common ways of financing expansion was to have cross subsidies from industrial users to the residential users and from urban to rural areas. This has perverse incentive effects which have been widely documented and criticized for quite a while. The ideal solution would clearly be to have targeted subsidies financed from tax revenue. Unfortunately, Africa's tax systems tend to be highly distorted and in many instances it may be preferable to give up a little bit of efficiency to achieve equity objectives by relying on cross-subsidies to keep tariff affordable.<sup>29</sup> Not all regulators or policymakers chose the same side of this

<sup>29</sup> To get a rough sense, it is useful to know that it costs roughly 1.2 to 1.5 times more to serve a residential client than it does to serve a non-residential client. If the tariff ratio is in that range, not much can be said of the extent to

efficiency-equity trade-off and the reform of the 1990s have often made efficiency prevail over equity. This has resulted in tariffs rebalancing which have tended to penalize the poor connected and reduced the scope to rely on cross-subsidies to finance service expansion.

41. Indeed, unconnected users still represent 40 to 60% of the population. For those potential users, it would be useful to get a sense of how affordable services are for those not connected to network and have to rely on alternative providers instead. A recent study by Kariuki and Schwartz (2004) provides a useful sense of the differences in water prices charged by a wide range of providers. This gives a sense of the differences in water service affordability between users connected and users not connected. The result of their survey of prices according to supply types is summarized in Figure 1.

Figure 1: Price of Water by Type of Service Provider



Source: Based on Kariuki and Schwartz (2004)

42. Figure 1 shows the wide variation in prices between different small scale providers, and within each category for different locations. While prices charged by small piped network operators are not dissimilar to those charged by the utility, unit prices for non networked services can increase several fold with the highest prices being recorded for mobile distributors (tankers and carters). For example, in Ghana, the price of water increased several fold as it moved along the supply chain (e.g. the water utility sells water to a tanker who sells it to a private individual with storage tank that in turn sells to a carter who delivers water to households in jerricans).

43. The evidence provided by Kariuki and Schwartz (2004) implies that the less “formal” the system on which a household needs to rely, the more likely it is that the higher the odds that the service is likely to become unaffordable and that rationing of consumption of improved water sources will be the norm. The main point is however

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which there are cross subsidies. If the tariff ratio is higher than that the 1.4 limit, there is clearly no cross-subsidy since the tariff ratio is higher than the cost ratio.

that the evidence reviewed here confirms that the limitations to access discussed so far can have very dramatic social consequences.

44. Overall, the following may summarize the overall evidence on the needs of the poorest:

- The users who are connected to a network do not have a major affordability problem
- The users who are not connected often do however have a major affordability problem, although they address it by rationing the services they consume
- Around 50-60% of the population is not connected to a utilities network and about 34% has only limited access to transport services to attend to local needs (education or health)
- The population not connected tends to be among the poorest income groups.

### 4.3 Infrastructure quality is also a challenge

45. Quality has several dimensions. The most widely reported measure is technical quality. It includes partial productivity indicators (i.e. output/employees or per connection), water or energy losses or outages or phone faults. This is a fairly objective measure which raises few issues—although their measurement is often quite uncertain. But there is also a second, much more subjective, measure of quality. It deals with the client orientation of service delivery. This can focus on relatively objective information such as number of clients per employee but it is often much more subjective. Indeed, the quality of service orientation is usually generated from perception surveys—e.g. the global competitiveness report or the investment climate assessments.

46. There is also a third, more subtle dimension. Because the cost of quality matters, economic efficiency matters. Indeed, the crucial importance of costs minimization in a sector in which cost padding is known to be quite common—and not just in developing countries—tends to often be ignored by policymakers responsible for the sector.<sup>30</sup> Cost padding hurts the poor because it contributes to the mismatch between ability to pay and tariff required to recover costs. They usually also hurt the taxpayers because the financing gaps the operators can't recover from users tend to be recovered from taxpayers—who finance subsidies given to operators. This assessment of costs is thus not independent of the assessment of quality since quality has a cost

47. In an ideal situation, quality choices would internalize the necessity to deliver services that meet the ability and willingness to pay of the users. Indeed, quality costs can hurt any users when there is an excess supply of quality just as much as lack of quality can hurt them. Not too long ago, everybody wanted to enjoy the transport speed of the Concorde, but few were able or even willing to pay for it; as a result, demand never reached the level needed to maintain the airplane financial viability. Similarly, providing a service quality associated with costs that would result in tariff levels inconsistent with the ability to pay would keep many of the poorest

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<sup>30</sup> See Flyjvberg et al. (2003)

looking for alternative solutions to their infrastructure needs—and in the process hurt the operators. The policy solution to this problem boils down to a match between the technology choices, the ability to pay of the users, the willingness to pay and the design of the tariff structure. This goes beyond the discussion covered in this paper.<sup>31</sup>

48. Table 3 summarizes all the information available for Africa and benchmarks it against the performance of three country groupings: low income, low middle income and upper middle income. Besides the poor level of coverage of the data, three things stand out, what stands out is that Africa's technical performance is quite poor across sectors when benchmarked against the performance of middle and high income groups. When benchmarked against its closest peer group, low income countries, the assessment is somewhat more positive. While Africa is roughly at par with the comparator for water, it seems to be doing technically somewhat better in electricity, telecoms and transport. Unfortunately, these can only be a very rough assessment in light of the limitations of the data and of the indicator availability mentioned earlier. Overall, Africa's image with respect to quality should continue to be a matter of concern to policymakers concerned with the image that their core utilities services are giving to investors and users.

49. What's even more problematic is that there is evidence that except for telecoms, quality is not improving or even getting worse in some sectors. In electricity, the general sense is a poor and deteriorating average performance but the story is a more complex one; the data on quality reported here reflects an assessment at the country level which is not totally compatible with what emerges from an assessment at the operator level. In water, the average quality performance has not evolved significantly; most importantly, very few of the poor performers are managing to catch up with the top performers (Mali and Rwanda seem to stand out on this front), also quite notable is the very wide diversity of experiences since the observations are spread across the two extremes of the diagonal. In a sample of 98 utilities representing 28 African countries, water services are available 17 hours per day (on average).<sup>32</sup> But the standard deviation is 7 hours. Moreover, 25% of the 98 utilities provide water services for less than 12 hours. For the road sector, the quality indicator measured here has been characterized by a status-quo—most countries are almost exactly on the diagonal.

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<sup>31</sup> A longer discussion of this issue is available in Estache, Foster and Wodon (2002)

<sup>32</sup> Water Utility Partnership for Africa (<http://www.wupafrika.org/spbnet/>)

**Table 3: Quality ratings of the main infrastructure services in Africa**

	2002 averages (sample sizes in parenthesis)			
	Africa	Low income	Lower-middle income	Upper-middle income
<b>Electricity</b>				
<i>Technical</i>				
Transmission and distribution losses (% of total output) <sup>(a)</sup>	22 (17)	24 (33)	15 (31)	14 (23)
<i>Perceived (1=worst 7=best)</i>				
Commercial perception of electricity service	4.3 (6)	2.8 (9)	4.2 (25)	5.2 (20)
Commercial perception of public agency electricity Provider <sup>(b)</sup>	4.3 (16)	4.0 (27)	5.0 (24)	5.3 (17)
<b>Water and Sanitation</b>				
<i>Technical</i>				
Piped to other sources of drinking water ratio <sup>(c)</sup>	0.34 (25)	0.34 (34)	0.71 (12)	0.73 (1)
<i>Perceived (1=worst 7=best)</i>				
Commercial perception of water service <sup>(b)</sup>	4.2 (16)	4.0 (27)	4.8 (24)	5.0 (18)
<b>Telecom</b>				
<i>Technical</i>				
Phone faults (reported faults per 100 mainlines) <sup>(d)</sup>	63 (40)	67 (49)	32 (39)	22 (27)
<i>Perceived (1=worst 7=best)</i>				
Commercial perception of telephone/fax infrastructure	4.3 (6)	3.4 (9)	4.9 (25)	5.6 (20)
Commercial perception of availability of mobile	5.7 (6)	5.0 (9)	5.8 (25)	6.0 (20)
Commercial perception of internet access in schools	2.8 (6)	2.1 (9)	3.0 (25)	3.8 (20)
Commercial perception of postal efficiency	3.7 (6)	3.1 (9)	3.5 (25)	4.4 (20)
<b>Transport</b>				
<i>Technical</i>				
Paved roads (% of total road network) <sup>(e)</sup>	25 (44)	29 (61)	48 (47)	55 (33)
<i>Perceived (1=worst 7=best)</i>				
Commercial perception of services delivered by road department <sup>(b)</sup>	3.7 (16)	3.4 (27)	4.2 (24)	4.1 (18)
Commercial perception of port facilities	3.8 (6)	2.6 (9)	3.5 (25)	3.8 (20)
Commercial perception of railway services	3.2 (6)	2.7 (9)	2.6 (25)	2.9 (20)
Commercial perception of air transport services	4.5 (6)	3.6 (9)	4.2 (25)	4.5 (20)

Source: Based on data presented in Estache and Goicoechea (2005)

Notes: averages figures correspond to unweighted averages of data available. The universes of countries by group are: Africa 48 countries, low income 65, lower-middle income 52, and upper-middle income 38

(a) Africa average includes 1 observation in 2000, and 16 in 2001

(b) Data available in 2000

(c) Africa average includes 4 observations in 1997, 6 in 1998, 6 in 1999, 4 in 2000, 4 in 2001, and 1 in 2002

(d) Africa average includes 5 observations in 1997, 6 in 1998, 5 in 1999, 2 in 2000, 6 in 2001, and 16 in 2002

(e) Africa average includes 1 observation in 1997, 1 in 1998, 32 in 1999, 6 in 2000, and 4 in 2001

50. As mentioned earlier, it is difficult to separate the discussion of quality from the discussion of costs. Poor quality tends to increase many of the costs in the long run, even if in the short run, cutting quality is a way of saving costs. The World Bank lending experience suggests that Africa is doing, on average, better than other regions. Indeed, its cost overruns in recent years were roughly 20% vs 22% for the rest of the borrowers—again there are some explanations, including the composition of loans, i.e. works vs. technical assistance. For Africa, as in the rest of the world, cost overruns tend to be the highest for transport and lowest in the telecoms sector (5%). Overall, however it does suggest that when costs overruns exist, they increase costs by about 20%.

51. The sense that cost is an issue also comes from studies of the economic efficiency of the sectors.<sup>33</sup> Overall, they suggest that production costs are excessive in almost all sectors (i.e. with averages excesses ranging from 15% to 45% according to the sectors), with the exemption maybe of the telecoms sector where the technological revolution has guaranteed the right incentives to maintain cost cutting efforts.<sup>34</sup>

52. Despite the limitations imposed by the poor quality of the data, the overall sense is that quality is certainly an important challenge. It matters a lot more than it is given credit by the ongoing debate on MDGs. Moreover, it matters from a fiscal viewpoint, poor quality is associated with high costs. Since a large share of the sector financing requirements are financed by today and tomorrow's taxpayers, cost overruns and inefficiencies place an unnecessary burden, in particular in view of the limited revenue generation ability of many African countries.

## 5. Africa's policy responses so far

53. This final descriptive section provides a partial view of the evolution in the market structures and in the institutions of the various sectors. The description is partial because it only focuses on only two dimensions of market structures and institutions: (i) the extent to which there is some degree of private sector participation in the sector (PPI) and (ii) the extent to which governments have decided to signal their commitment to transparent and accountable regulation by creating an "independent" regulatory agency (IRA) for the sector.<sup>35</sup>

54. The two dimensions were chosen because they are among the most controversial of the 1990s. Specific new data were generated for this paper to

<sup>33</sup> For instance, see Mbangala (2004) for railways, Tovar and Trujillo (2005) for electricity, Estache and Rossi (2005) for water or Colson and Mbangala (2003) for telecoms

<sup>34</sup> This extrapolation from partial data on production and on inputs is a very far stretch conceptually since it uses information on efficiency levels in production to imply cost efficiency levels. It is only done to provide a very rough order of magnitude. Not a precise measurement.

<sup>35</sup> There is quite a widespread interest in assessing these reforms but most rely on country specific case studies or on small samples of countries. See for instance, Clark et al. (2005), Eberhard et al. (2005), Bhagavan (1999) or Karekezi and MacKenzie (2002) or Karekezi et al (2001)

identify their actual importance in Africa. As it turns out, quite consistent with the fact that only 10% of Africa's investment needs were financed by the private sector, these data show that these two dimensions are not the central organizational or institutional issues for many sectors.

55. Many other dimensions have been considered during the 1990s reforms which have influenced the infrastructure markets and their institutions—i.e. decentralization, separation of rural and urban agencies, restructuring to promote competition, etc. These will not be addressed here, even though they are obviously critical determinants of the effectiveness of Africa's governments to meet the needs of their populations, in particular their rural poor.

56. Even within the two dimensions analyzed here the information is partial. There are many ways to introduce the private sector—sales, concessions, services or management contracts, outsourcing, etc.—and to develop an accountable regulatory capacity—sector specific vs. multi-sector, contract based vs. discretionary regulation, etc. It is however beyond the scope of this paper to generate data at that level of detail for all countries of the regions and all sectors. When the information is available, it will be discussed appropriately.

57. Table 4 provides a quantitative snapshot of PPI and IRA in Africa as of mid 2004—the country specific data is available in the statistical appendix.<sup>36</sup> The utilities and transport surveys were conducted in very different ways. For utilities, the survey was designed to provide only a very global view of the situation. Indeed, when sending questionnaires or interviewing individuals the two specific questions asked were as follows:

(a) Has a regulatory body that is separate from the utility and from the Ministry started to work?

(b) Is there any (significant) private participation in the financing of the sector?

58. The idea was to get a binary answer (yes or no) to these two questions. On the second one, the information revealed by the replies reveals the extent of foreign private investment rather than the extent of any private participation—i.e. including domestic investment.

### **5.1 The large foreign private sector in Africa's infrastructure**

59. Table 4 suggests that the strongest private sector presence is for ports with 57% of the countries with ports working with some type of PPI. Next is in the telecoms sector with 51%. However, even there—and this is for the fixed line business only—, it may seem to be low in comparison to common wisdom on PPI in the sector. This is because a somewhat surprisingly large share of the operators has actually been corporatized but not privatized. Next in line in terms of the PPI performance are rail and electricity generation—over 40% of the cases for these three infrastructure business lines. Note that this does not mean that all of these activities

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<sup>36</sup> For utilities, the methodological details on the survey are described in Estache and Goicoechea (2005). For transport, the details are provided in Ouedraogo (2005).

are privatized. It simply means that these sectors have been unbundled enough to allow some parts to be operated by the private sector.

**Table 4: Extent of reforms in Africa's infrastructure sectors as of 2004**

	shares of sample (% of total sample size for each country grouping given in parenthesis)			
	Africa	Low income	Lower- middle income	Upper- middle income
<b>Electricity</b>				
Existence of Independent Regulatory Agency	36% (44)	38% (61)	63% (43)	63% (32)
Existence of Private Capital in Electricity Generation	41% (46)	41% (59)	48% (42)	58% (33)
Existence of Private Capital in Electricity Distribution	28% (46)	29% (62)	37% (43)	48% (33)
<b>Water and Sanitation</b>				
Existence of Independent Regulatory Agency	12% (42)	11% (55)	32% (38)	28% (29)
Existence of Private Capital	20% (44)	18% (55)	50% (40)	47% (32)
<b>Telecoms</b>				
Existence of Independent Regulatory Agency	77% (48)	69% (65)	60% (52)	71% (38)
Existence of Private Capital	51% (47)	50% (64)	62% (50)	72% (32)
<b>Transport – railways</b>				
Existence of Independent Regulatory Agency	3% (31)	2% (41)	8% (38)	19% (21)
Existence of Private Participation	48% (31)	34% (41)	26% (38)	60% (20)
<b>Transport – ports</b>				
Existence of Independent Regulatory Agency	22% (23)	n.a.	n.a.	n.a.
Existence of Private Participation	57% (26)	n.a.	n.a.	n.a.
<b>Transport – airports</b>				
Existence of Independent Regulatory Agency	11% (27)	n.a.	n.a.	n.a.
Existence of Private Participation	26% (27)	n.a.	n.a.	n.a.

Sources: Estache and Goicoechea (2005) and Jane's World Railways 2003-04.

Notes:

\* Independent agency refers to a body that is separate from the Ministry and from the operator in terms of financing, decision-making, and structure.

\* Private participation refers to the existence of any kind of private participation including management and service contracts. Private capital refers to private participation that requires capital investment from private parties, includes only concessions, divestitures, and built-operate-transfer (BOT) contracts.

\* Rail data was published in 2004, but there is a lag of about 2 years in the data. Thus, it would be more accurate to say that rail data is a snapshot of 2002.

\* Ports and airport data is based on a survey of World Bank task managers conducted in the fall of 2004

60. In many instances, the segments in which the private sector is present are not essential to the operation of the infrastructure service. In airports for instance, only 26% have some form of PPI deal—in airport management--, but when accounting for private sector participation in commercial services the share increases



to 46%. Considering aeronautical services, it drops to 21% and for air traffic control to 8%. In electricity generation, it simply means that there is at least 1 private generator. In a sense, this data tells more about the degree of opening of the infrastructure business to competition for or in the market in at least some segments. The sectors the least successful in attracting private sector interest are water and electricity distribution for utilities and airport infrastructure, where fewer than 30% of the countries count on PPI, with the lowest performance for the water sector with only 1 country in 5. All in all, Africa's performance on this front is consistent with that of its peers. It is however well below the performance of lower-middle and upper-middle income.

61. To keep things in perspective, it may be useful to point out that considered jointly; it is this level of private sector presence that financed no more than 10% of Africa's investment needs during the 1990s. Latin America, the best performer on this front, managed to generate private financing of about 35% at most for its needs. Table 5 provides some insights on the sectoral distribution of the private sector commitments to Africa since the early 1990s. Roughly 70% of those went to the telecoms sector and about 20% to the electricity sector. Neither transport nor water and sanitation were very effective at attracting the private sector. Table 5 also shows that average project sizes confirm the total volume bias in favor of telecoms and electricity.

**Table 5: Nature of Private Participation in Africa's Infrastructure (1990-2003)**

	<b>Concessions</b>	<b>Greenfield</b>	<b>Divestiture</b>	<b>Management</b>	<b>Total</b>
<b>Electricity</b>					
Total investment (US\$ millions)	1,682	3,377	1,104	13	6,175
Number of projects	12	21	5	10	48
Average project size (US\$ millions)	140	161	221	1	523
<b>Water &amp; Sanitation</b>					
Total investment (US\$ millions)	197	13	..	21	230
Number of projects	2	2	..	10	14
Average project size (US\$ millions)	98	6	..	2	107
<b>Transport</b>					
Total investment (US\$ millions)	1,709	871	169	0	2,749
Number of projects	18	12	3	11	44
Average project size (US\$ millions)	95	73	56	0	224
<b>ICT</b>					
Total investment (US\$ millions)	..	11,960	9,375	388	21,724
Number of projects	..	95	15	2	112
Average project size (US\$ millions)	..	126	625	194	945

Notes:\* Total investment adds investment in government assets and investment in facilities and is based on commitments.

62. In total, greenfield contracts are the most popular but this is driven by the experience of the two most attractive sectors for investors where greenfield projects tend to dominate all other contract forms. The electricity sector has also seen a fair volume of concession and management contract while for the telecoms sector, the second most common type of PPI arrangements are divestitures or sales—but way behind “Greenfield projects”. For Water, the preferred instrument is a management contract. For transport, concessions dominate but are followed closely by concession.

63. The main lesson may be that for many countries, it would be a mistake to continue emphasizing the debate on the ideal way of meeting Africa’s need on the role of large scale private supply. The public sector continues to play a major role and the small scale operators are taking a slowly increasing, yet generally underestimated role in catering to the needs of the populations not supplied by the actors with higher visibility. This segment of the market supply has its own quality, affordability and sustainability issues which are too seldom addressed as part of the high profile policy debate. This is an issue because in many countries, these suppliers cater to the needs of shares of the population at least as large as those being served by public and private utilities.

## **5.2 Africa’s experience with “independent” regulatory agencies (IRA)**

64. A second common dimension mentioned by analysts of infrastructure reform is the commitment to independent regulation. Table 5 provides a better handle on what is known about the extent to which IRAs have spread in the region. The first point to observe is that as in the case of PPI, the spread of IRAs in the region is consistent with the level of commitment to the creation of separate regulatory agencies observed in the peer group—LICs. In almost all sectors—although the information is not available for ports and airports--, the commitment is however much weaker than it has been in richer developing countries. The only exception is the telecoms sector. Africa has the highest share of countries with an independent regulation of the sector—77% vs. 71% for upper middle income countries and 60% for lower middle income countries. While a third of the higher income countries have an IRA for electricity, only one in three African countries has an IRA in that sector. The lowest share of countries with IRAs are for transport and water with a share of 22% or less—as low as 3% in railways and 11% in airports

65. A simple comparison for each sector of the shares for IRA and PPI provides some insights on the interactions between these two dimensions of reform. From the energy experience, it should be clear that the commitment to institutional reform has not yet generated the expected private investment payoffs. More African countries now have an IRA than there are countries with private operators in electricity distribution. The experience of the telecoms sector is misleading. There are indeed many more cases of IRAs than cases of private fixed operators. This is related to the facts that: (i) many African countries have favored corporatization over privatization and (ii) the mobile business has been the main entry point for private operators in most countries.

66. The various sectors experiences, and in particular water, suggest that IRAs are not necessary to attract the private sector in all cases since a larger share of countries enjoy private operators than IRAs. The risks are not the same. The need for regulation is lower for transport activities than for water since intermodal or intramodal competition tends to be important in transport while the residual monopoly power continues to be strong in water, in particular urban, where alternatives tend to be much more costly.

### 5.3 Africa's experience with "independent" regulatory agencies (IRA)

67. It's now been 5 to 10 years for most African countries who have reformed since they start working on those reforms. The analysis of the achievements so far is still modest. But it is starting to benefit from a combination of good econometric work to measure the relative importance of the various factors and their interactions and more detailed country specific studies. This section is a very brief overview of what the economic literature offers on the impact of reforms in Africa. Table 6 shows summarizes the information available

**Table 6**  
**Lessons from econometric assessments of the impact of PPI and IRA the sectors' performance**  
 (++, very positive; + = positive/increase; - = negative/decline;  
 ? = undetermined; n.a. no good information available)

	Investment/ access rates	Quality	Average Costs or inefficiency	Average Prices	Comments
<b>Electricity</b>	++	++	None	none	IRA and PPI work <u>only</u> jointly Risks matter
<b>Water</b>	?	+	0/-	<b>n.a.</b>	Corruption and institutions matter
<b>Telecoms</b>	++	?	-	-	IRA and PPI work better jointly Competition is what matters Politics matter

68. The main lessons from this overview of the statistical and econometric evidence are quite simple and generally predictable:

- (i) in all sectors, these reforms tend to have a stronger impact—and sometime any at all—when implemented jointly; regulation or competition tends to be much more important than ownership
- (ii) in all sectors but in the water sector, PPI and IRA, have been associated on average with increases in investment, access rates and quality;
- (iii) in all sectors for which some measure is available, these reforms have also been associated with improvements in quality,

- (iv) the impact on average tariffs has generally been not statistically significant in energy but has been associated with a decline in telecoms and

69. On telecoms, the most relevant research on the impact of the main reforms adds some information.. It suggests that (i) privatization tends to speed up coverage and cut average prices, (ii) the effect of competition is however much more important; (iii) good regulation matters to affordability; (iv) quality problems get better identified after reform and (v) the introduction of IRA offsets some of the effects of corruption and of investment risks.

70. These conclusions are of course still preliminary because it takes time before institutional reforms can work their way through bureaucracies. But the analysis of the effects of reforms so far are already teaching policymakers some useful lessons. Most important maybe is the lesson that we need to look for a better match between the reforms designs and the local constraints and needs. The restructuring of the markets, the interactions with the private sector, the definition of the new role of the government all need to fine tuned to address this lesson.

## **6. Exploring the new opportunities to meet Africa's needs?**

71. In this last section, I discuss some of the main directions the design of infrastructure is likely to follow. These are of course personal convictions. But they are based on very direct experiences in trying to deal with the issues. They are also based on the firm conviction that there are solutions for Africa. The small scale private sector has already found many of them for some users frustrated by the failures of the large scale public and private provider. It is however essential to come up solution that cater to the needs of the users, in particular the poorest who have for too long had to rely on unsafe, unreliable and often overpriced alternatives to compensate for the policy failures. The remainder of this section is a list of the main policy areas in which new opportunities for more effective service delivery need to be looked at.

72. First, I believe that, if the infrastructure needs are to be met within the next 10 years or so, it will be difficult for the sector to function without some type of collaboration with private provider. But governments are likely to look into different types of market structures and different types of contracts from the ones that prevailed during the 1990s. While the international community has generally been quite focused on the potential role of large international OECD based operators in financing the sector, the evidence seems to suggest that the scope for such a large role is at best modest in Africa. This opens two main roads to adjust the current model. The first adjustment is to look for non-OECD operators, the second is to look for different types of collaboration with these operators.

73. In terms of the adjustments to the market structure, adjustment, there are also two options. The first is to try to promote local operators and in general this will consist of small scale operators as discussed earlier. The fast growing adoption of this solution and the initial evidence of its effectiveness in East Africa point in that

direction. The alternative is to try to promote South-South FDI. The growing presence of South African, Chinese or Malaysian operators everywhere in Africa suggests that there is scope for this kind of approach as well. Most of the evidence available on these new forms of PPI is however anecdotal and very little is known on their effectiveness in delivering service levels consistent with Africa's needs.

74. Second, the types of contracts with private operators that are likely to emerge are likely to be different from the one observed during the 1990s. One of the important questions to address going forward is the need to match contract types and legal systems. Indeed, one of the emerging debates is the apparent incompatibility of certain contract types with the historical heritage of some countries. Concession contracts have a clear anglo-saxon twist while affermage have a clear "Francophile" flavor. The domination of concession contracts throughout Africa where PPI has been implemented is a possible explanation for the apparent higher effectiveness of PPI and IRA oriented reforms in Anglophone Africa in comparison to non-Anglophone Africa. The sample sizes available to assess the equivalent impact of the adoption of affermage contracts are however very small. But there is a clear need to revisit this issue as part of the design of the next wave of reform. Not all legal frameworks are comparable and these will not be changed by infrastructure reforms. The challenge is to figure out how infrastructure contracts can be designed to fit the legal frameworks while still improving the performance of the sectors along a wide array of criteria. A lot more work is also needed in this area. Maybe just as importantly, a menu of contracts will have to appear that recognizes that not all sector and not all countries are equally likely to attract commitments to investment by foreign or local private operators. Contracts will also have to be diversified along these sorts of dimensions.

75. Third, the experience of the 1990s has also revealed a surprising wide range of views on what constitutes good economic regulation. The same diversity characterizes the views on the necessity and on the ideal design of a regulatory institution. Experts and others have provided a plethora of ideas to governments, sometimes contradictory, on both of these themes. It is thus essential to try to improve the coordination of policy advice given to Africa and to do so to generate evidence that allows government to distinguish between dogma and substance. This will show that one size does not fit all but it will also identify a minimum set of principles common to all reforms but more consistent with the region's needs and constraints. This set of principles will have to be matched by the identification of a common set of instruments that will allow and ensure their implementation. Quality, costs, fiscal, efficiency and equity concerns will only be addressed if a regulator, independent or not, is given the mandate and the power to do so and if the operators who enjoy a monopoly over service and information are mandated to contribute enough information to ensure that the government's objectives are met. Similarly, once governments have made transparent commitments to operators, it is essential to ensure that the country has a regulator capable of enforcing these commitments and that this regulator, once more independent or not, can be made accountable for its decisions. All these concerns imply a commitment not only to set up that regulatory capacity but it also means a commitment to support it as needed until the capacity has actually been built, trained and coached appropriately.

76. Fourth, the experience of the 1990s has also taught us that pricing is an important dimension of the effectiveness of any reform in the sector. The standard message to reformers will continue to emphasize the need to improve the recovery of the costs incurred in delivering the services—assuming that these costs have been minimized. The social situation in most of Africa however is such that cost recovery for operators is often likely to imply direct subsidies or cross subsidies. It is quite essential for the international community and for Africa to not only recognize this basic fact but to start generating the information that will allow a quantification of what these direct and indirect subsidies will cost.

77. Finally, given its tremendous role in the financing of the sector in Africa, it is important to conclude this list with a discussion of the characteristics of ODA and of its idiosyncrasies. ODA, indeed, has its own biases which matter to the performance of Africa's infrastructure. The main lessons from the 1990s on this front can be summarized as follows. The large scale suppliers have tended to get a large share of the attention of the international community and of the donors even if they cater to only a small share of the population and most typically the rich. More recently, alternative technologies have started to become the focus of many agencies, shifting resources away from more traditional businesses with a view to help the rural poor. There is however, some concern with the fact that however important these technologies may be, they may not be the solution that will cater to the majority of today's and tomorrow's poor (the rural and the urban poor). In some instances, the resource allocation and the focus of the advice of bilateral donors has also continued to tend to be associated with activities that support the interest of their national companies. This is rational and consistent with any definition of sovereignty in the allocation of national resources but it can make and has occasionally made aid coordination difficult. In other instances, agencies have both a private sector development branch and a policy branches which in principle function with Chinese walls to avoid conflicts of interests. These walls do not however function as effectively as generally hoped, creating difficulties in relations between governments and beneficiaries of aid. Finally, there is often a diversity of views across donors and sometimes within governments or within donor agencies which tend to increase the difficulty of building institutions. Additional effort is needed to document the sources of (often legitimate) differences across donors, and within donors but more transparency is needed to avoid inconsistent messages and if Africa's interests are to be at the top of donor priorities in this sector.

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**Impact of PPI  
oriented reforms  
in Africa:  
Survey of evidence**

**Antonio Estache**

**Tunis 2006**

# Outline & focus

- **How much reform?**
  - large scale (mostly foreign) PPI
  - creation of regulatory agencies (IRAs)
- **Impact assessment**
  - access in general
  - access across income classes
  - quality
  - investment
- **Focus on countries, not projects!**

# WARNING

Quality of assessment is limited by:

- **quality of data**

- Full coverage for reforms
- But for access, quality & distribution, assessment is based on sample of 17 countries for which data is available in early 1990s and early 2000s)

- **time elapsed since reforms started**

- it takes time to build institutions and most reforms started less than 3 years ago!

- **partial coverage of reforms, it ignores:**

- PPI without investment
- SMEs promotion
- rural agencies
- decentralization
- supra-national initiatives... and many more

How widespread were  
PPI  
&  
the creation of IRAs  
in Africa?

# How much reform in utilities?

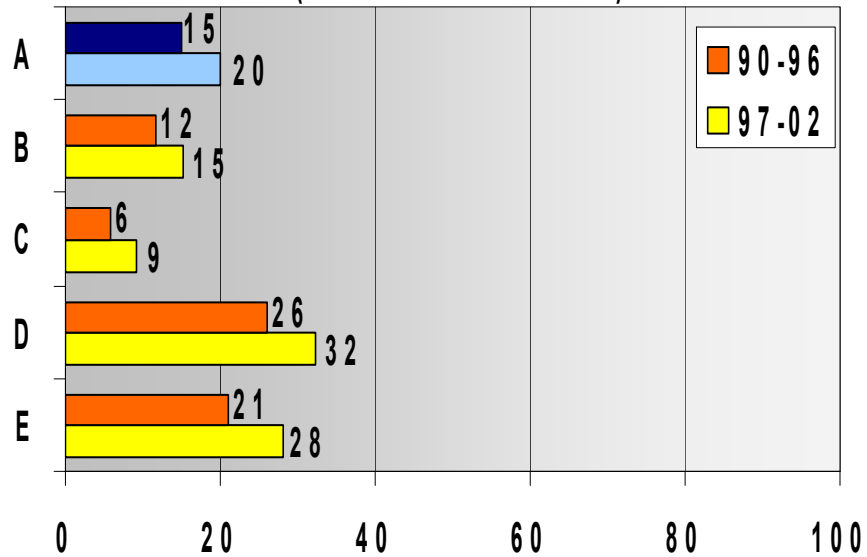
<b>Percentage of countries in sample</b>				
	<b>With a regulator</b>		<b>With private participation</b>	
	<b>Africa</b>	<b>Low income</b>	<b>Africa</b>	<b>Low income</b>
<b>Water</b>	14%	13%	20%	18%
<b>Electricity</b>	36%	38%	28%	29%
<b>Telecoms</b>	77%	69%	51%	50%

# How much reform in transport?

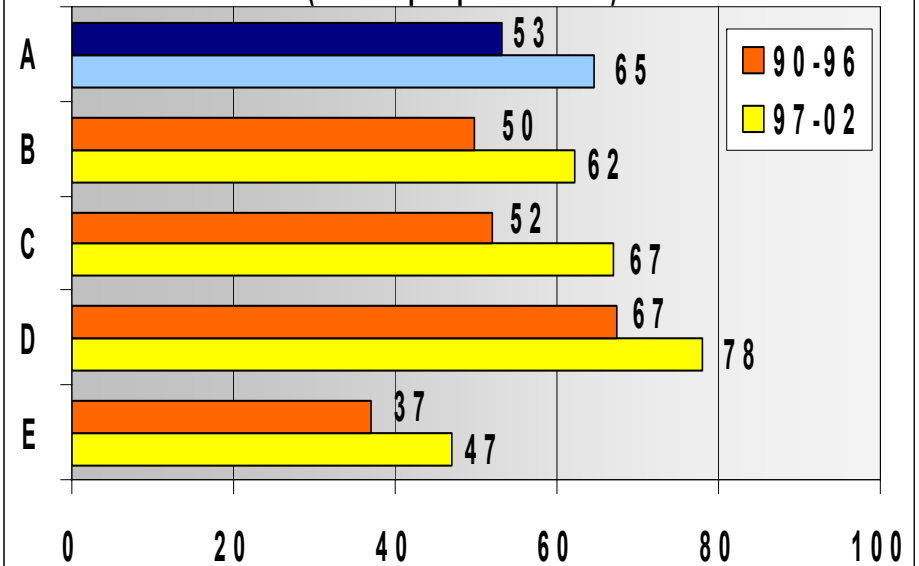
<b>Percentage of countries in sample</b>		
	<b>With “regulator”</b>	<b>With private participation</b>
<b>Air</b>	<b>11%</b>	<b>63%</b>
<b>Ports</b>	<b>22%</b>	<b>87%</b>
<b>Rail</b>	<b>3%</b>	<b>47%</b>
<b>Roads</b>	<b>36%</b>	<b>N.A.</b>

What  
happened to  
access rates?

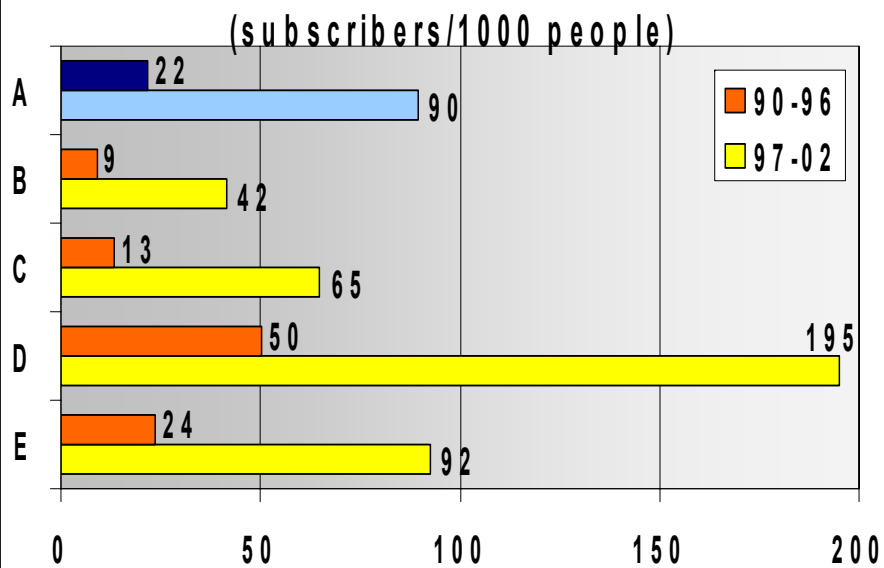
## Electricity Network (% of households)



## Improved Water (% of population)



## Teledensity (subscribers/1000 people)



## *Access averages of:*

**A:** all countries in sample

**B:** countries without IRA, nor PPI

**C:** countries with IRA, without PPI

**D:** countries without IRA, with PPI

**E:** countries with IRA, with PPI



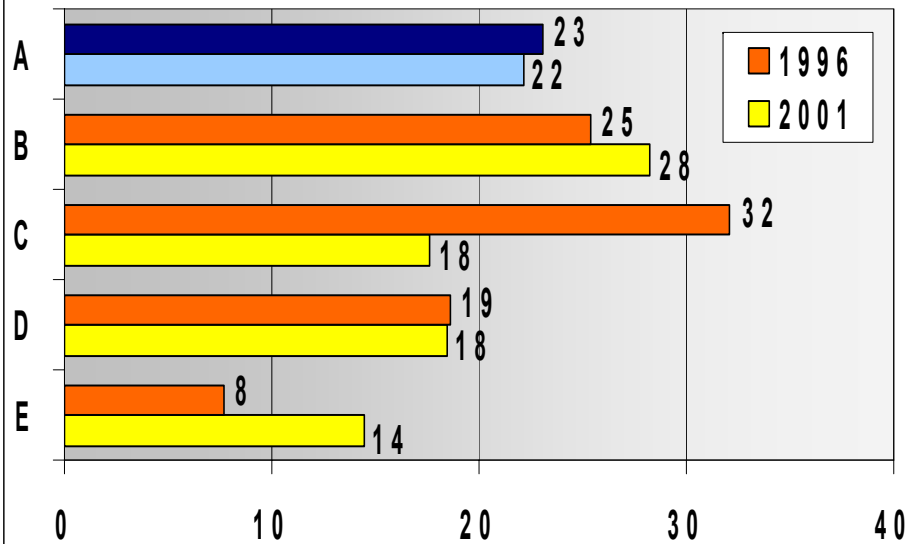
What happened  
to access across  
income groups?

# Access & income distribution

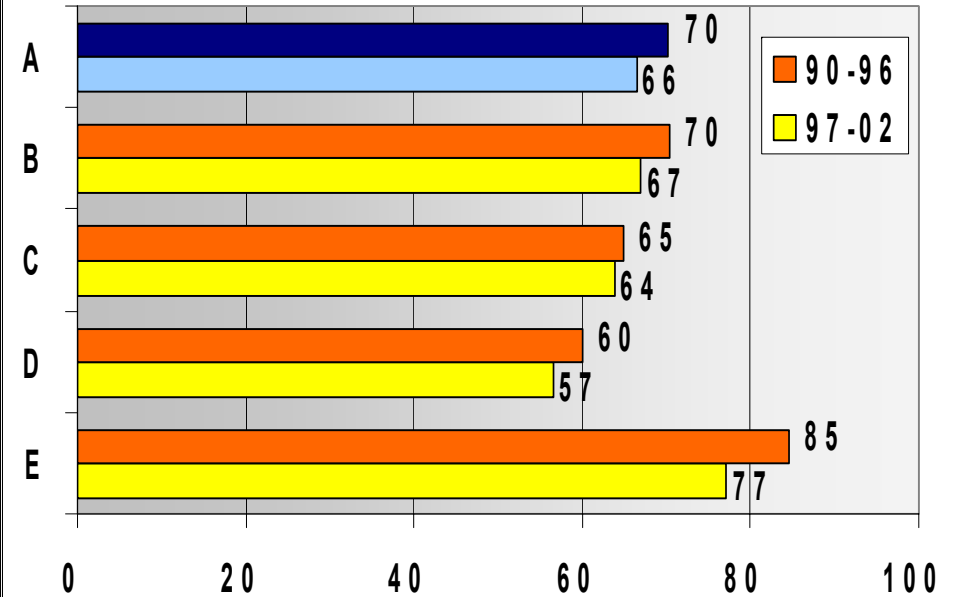
	Electricity		Piped water		Improved Water	
	<i>Early 90s</i>	<i>Early 00s</i>	<i>Early 90s</i>	<i>Early 00s</i>	<i>Early 90s</i>	<i>Early 00s</i>
Poor	0%	0%	0%	0%	35%	39%
Q2	1%	4%	0%	0%	41%	53%
Q3	4%	13%	0%	2%	51%	57%
Q4	22%	32%	13%	10%	70%	70%
Rich	68%	75%	53%	43%	88%	85%

What happened  
to quality?

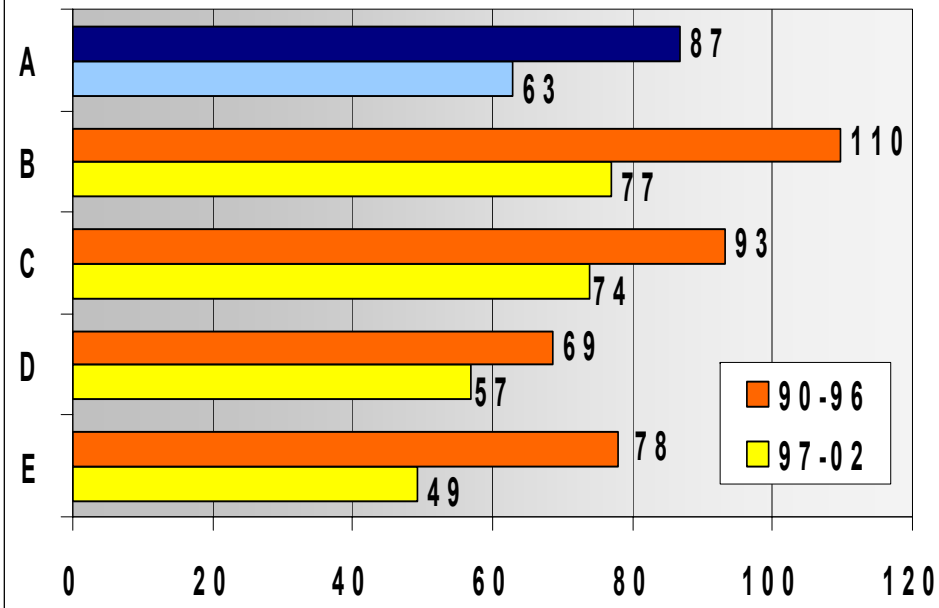
### Electricity Losses (%)



### Non-Piped Water as % total



### Phone Faults/100 mainlines



## *Quality averages of:*

**A:** all countries in sample

**B:** countries without IRA, nor PPI

**C:** countries with IRA, without PPI

**D:** countries without IRA, with PPI

**E:** countries with IRA, with PPI

What happened in  
the road sector?

# The Roads Agency Story

## **With road agency:**

- 1. Angola**
- 2. Cape Verde**
- 3. Cote d'Ivoire**
- 4. Ethiopia**
- 5. Ghana**
- 6. Malawi**
- 7. Mozambique**
- 8. Senegal\***
- 9. Tanzania**

## **Without road agency:**

- |                         |                       |
|-------------------------|-----------------------|
| <b>1. Benin</b>         | <b>10. Lesotho</b>    |
| <b>2. Burkina Faso*</b> | <b>11. Madagascar</b> |
| <b>3. Burundi</b>       | <b>12. Mali</b>       |
| <b>4. Cameroon</b>      | <b>13. Niger</b>      |
| <b>5. CAR</b>           | <b>14. Nigeria*</b>   |
| <b>6. Chad</b>          | <b>15. Rwanda</b>     |
| <b>7. Gabon</b>         | <b>16. Togo</b>       |
| <b>8. Guinea</b>        | <b>17. Zimbabwe</b>   |
| <b>9. Kenya</b>         |                       |

In a sample of 26 countries, only 3 have not established a roads fund (marked with asterisk)

# What are roads reform achieving?

	<i>Change in road density (km/1000 people)</i>	<i>Change in share of paved roads (%)</i>
<b>Without Road Agencies</b>	<b>-9%</b>	<b>5%</b>
<b>With Road Agencies</b>	<b>4%</b>	<b>-12%</b>
<b>Total</b>	<b>-4%</b>	<b>-1%</b>

# Infrastructure Investment

## **Needs:**

**Investment: +/- 5% of GDP**

**O&M: +/-4% of GDP**

## **Today:**

**total expenditure < 2.0-2.5% of GDP  
(private investment < 0.3% of GDP)**



# Conclusions (1)

- Access rates improved a bit in general,
  - For utilities,
    - when both IRA & PPI but no clear evidence when partial reforms;
      - Better stories for telecoms and electricity than for water or sanitation
  - For transport,
    - too early to tell but promising improvement in network management
- Quality improved a bit in general:
  - more with either PPI or IRA than if no reform

# Conclusions (2)

- Restructuring DID NOT...
  - *Generate large FDI flows*
    - *5-6 countries got most of it*
    - *...and it wasn't a large share of needs*
  - *Address the needs of the poor*
    - *60% poorest of the region were excluded of big item reforms*
      - *Alternative with local PPI seem to be delivering better*

# Conclusions (3)

To meet needs AND

To get to fast track growth:

=> Look beyond large scale PPI & IRA

=> New model needs to deliver:

- More ODA, local PPI & cost recovery

- Faster improvements

- In a more equitable way

- More cost effectively

- Under more transparency & accountability!

**THANK YOU  
FOR YOUR  
PATIENCE!**