

# **Rethinking Infrastructure for Development**

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*Closing Remarks*

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Good afternoon, ladies and gentlemen,

We have reached the end of a very busy two days. In keeping with the tradition of past ABCDE conferences, we have covered an enormous amount of ground during this period – several keynote speeches, four different plenary sessions, numerous parallel sessions that required us to make difficult choices among diverse topics, and countless engaging conversations in the hallways and dining areas. I know that for me, the issues raised and perspectives provided over these two days will require time to absorb – not only at an analytic level, but also in terms of how the development community can be energized in response to the ideas put forth.

Because of the richness of our discussions here in Tokyo, the challenge of putting together concluding remarks seems especially daunting – with so much material to choose from, whatever I focus on will necessarily mean other topics are left out. But in closing, it is perhaps useful to return to the theme of our conference: “Rethinking Infrastructure for Development.”

As **Mr. Wolfowitz** noted in his opening remarks, this title is itself suggestive – we are *rethinking* infrastructure because what we have been doing has not been working well enough in light of the enormous challenges faced by developing countries. Our discussions have revealed just how broad are the infrastructure needs and how multi-dimensional are the policies and approaches that must be pursued. The infrastructure agenda encompasses diverse sectors – transport, telecommunications, water, power – in an equally wide range of settings – from

isolated lagging rural regions to burgeoning urban centers, from small local-level projects to massive multi-country regional initiatives. The scope of the problem is huge, the complexity enormous – but the need for progress is overwhelming.

The full range of topics considered during the conference has been broad: sessions on water management, disaster prevention and management, urban infrastructure and governance, foreign aid and aid for trade, poverty reduction strategies, and global development finance. But for my concluding remarks, I would like to draw on the discussions that occurred at the *four plenary sessions* – infrastructure and growth; infrastructure and climate change; infrastructure and rural development; and infrastructure and regional cooperation. I will first provide a very brief review of what I took away from these four sessions, and then move on to consider a number of cross-cutting issues within the context of the broader investment framework.

In the first plenary session, **Antonio Estache** began by discussing why infrastructure has re-emerged on the policy and research agenda. As of today, infrastructure quality and affordability remain serious issues, posing a continuing bottleneck for firms and a drag on the investment climate, while in addition, access rates for households lag, and public sector financing has fallen. The perception that infrastructure reforms were widespread is misleading – the “privatization” of the sector has been limited; moves towards independent regulators were uneven across sectors and countries; and progress was slow in other areas. He identified four emerging policy areas: first, revisiting infrastructure investment priorities – both among sectors and national versus local – so that available resources generate the biggest growth “bang for the buck”; second, anticipating and avoiding policies that lead to regressive outcomes that “punish the poor”; third, reevaluating the role of public sector financing as it appears that the private sector often can not – or will not – carry the burden alone; and fourth, responding to concerns

over corruption and governance through efforts to strengthen regulation and foster transparency in areas still dominated by monopolies – both public and private, domestic and global.

The second plenary session confronted the contentious challenge of how to deal with the growing evidence that human development is contributing to global climate change. **Michael Grubb** explored the links between global growth, energy use and climate change, and what opportunities and tradeoffs exist in efforts to tackle the problem. The link with infrastructure is quite direct – the pattern of energy use is, to a large extent, driven by infrastructure choices. Given the complex relationship between emissions and development, the evolution of future emissions will be driven primarily by the combination of abatement efforts by the industrialized countries and the capacity of developing countries to grow while “leapfrogging” toward lower-emitting technologies. Here the most important channel will be changing the technology embedded in the infrastructure investments that will make up the new capital stock – not just for power generation, but for transport systems or buildings. The scenarios for China presented by **Jiang Kejun** underscore this finding – they describe a range of policy interventions and technology choices that together can reduce the rate of growth of energy use in coming decades and even more dramatically affect the projected emission of greenhouse gases. As stressed by **Zmarak Shalizi**, avoiding lock-in situations is essential. For example, by 2015 half of China’s urban residential and commercial buildings will have been built since 2000. Energy use in these new buildings can be cut by half with a 10 percent increase in construction costs. If nothing is done now, it will take 50-100 years to eliminate these excessive emissions.

The third plenary session considered the particular challenge of infrastructure investment to promote agricultural development. As **Per Pinstrup-Andersen** noted, agriculture continues to constitute the core of most low-income economies, with significant potential to contribute to poverty reduction. But performance has not always matched potential, raising the question of

whether the policy and institutional environment is sufficiently supportive. In this context, rural infrastructure is key – it complements agricultural research and technology and raises productivity, it facilitates market integration over both space and time, and it can encourage broader institutional development, such as attracting financial institutions to rural areas. Despite its importance, the quantity and quality of rural infrastructure is woefully inadequate, especially in the least-developed economies. The limited available evidence on the return to rural infrastructure investments suggests relatively high returns, pointing to underinvestment in rural infrastructure – an outcome reflecting earlier failed efforts, limited private sector engagement, curtailed public investment attributable in part to tight fiscal constraints, and a mismatch between centralized resources and decentralized needs.

In a companion paper in this session, **Masahisa Fujita** looked at the special challenges posed by efforts to develop lagging rural areas. Based on programs developed in Japan – such as “one village one product” – he considers the potential from a rural development strategy based on “brand agriculture” which exploits local resources to develop increasingly sophisticated and varied local products and services that in turn can create brand recognition and loyalty. Infrastructure is key: brand agriculture can not evolve without successive improvements in various types of “hard” infrastructure, from electricity, water and roads, to “soft” aspects, including marketing and technical support.

In the final plenary session, **Liqun Jin** focused on cross-border infrastructure and its role in promoting regional (and global) integration. While trade and FDI have long been viewed as important drivers of growth, development, and poverty reduction, the potential contribution of regional infrastructure—and the “connectivity” it promotes—is increasingly recognized. The impressive expansion of trade, investment, and production networks that has occurred in Asia over the last two decades places new demands on logistics, distribution channels, and

infrastructure. While the successful East Asian economies have invested heavily in infrastructure to meet these demands, there are still tremendous infrastructure deficiencies for poorer Asian economies, or even for lagging regions in faster-growing economies. Reviewing examples of cross-border infrastructure investment, he concludes that even when projects are in the private sector, the role of governments is crucial – to share risks, facilitate the distribution of benefits and costs across constituencies, deal with cross-border externalities, and provide policy credibility and continuity.

This overview of the plenary sessions provides a diverse agenda on topics for which further research is called for. *But it does not naturally lead to an obvious policy framework within which to evaluate infrastructure investment options and tradeoffs.* To shed some light on this question, I want to comment on the near absence of cost-benefit considerations in the infrastructure sessions – a point made by several plenary session participants – and show how it points to several important cross-cutting issues.

Back in the 1970s, when everything in life seemed simpler, there was a view that all investment projects, public or private, could be analyzed through standard market indicators. The expected value of a project was simply the discounted sum of costs and benefits over its lifetime. For public projects, the necessary “social” cost-benefit analysis required adjusting some market indicators to reflect that private and public valuations did not always coincide. Shadow prices were used when there were no market prices or when they yielded a distorted signal of the social value of a good or the social cost of a resource. Distributional impacts had to be considered as a possible source of divergence between private and social valuations, and externalities – whether positive or negative – had to be taken into account. These shadow prices, external and distributional effects were increasingly derived from comprehensive models of the whole economy, especially when correcting for monopoly distortions or in the case of projects large

enough to affect the overall price system. For those of us old enough to remember, these were the “good old days” of the Little-Mirrlees manual of cost-benefit analysis or its Dasgupta, Marglin and Sen competitor. Cost-benefit analysis was the name of the game in the field of public finance, and in particular public spending, both in developed and in developing countries. Social rates of return between alternative projects could be computed and the best projects selected, and infrastructure was the field of application *par excellence* of these techniques.

Thirty years later, cost-benefit analysis appears much less frequently in the toolbox of public finance analysts in developing countries. Yet, the problem of measuring the rate of return of specific infrastructure projects has certainly not disappeared – yesterday **Antonio Estache** was reporting rates of return on infrastructure in Africa that ranged from 20-40% to 200%! Moreover, the problem of comparing the rate of return of various projects in order to select the “optimal” ones has not disappeared either.

Why has the use of cost-benefit analysis declined? There are several reasons why the empirical implementation of the theoretical construct behind cost-benefit analysis turned out to be overly ambitious. First, for a while we thought that econometrics would solve all measurement problems and provide all the quantifiable information necessary for project analysis. This proved to be overly optimistic – we’ve made progress, but simply not enough. More importantly, two other related factors may have contributed to the shift away from cost-benefit analysis: first, the growing faith in the primacy of the market that culminated with the ‘transition economies’ period in the 1990s, and second, the underlying ‘planning’ character of cost-benefit analysis that caused it to overlook behavioral responses from both beneficiaries and bureaucrats and the possibility that not all investments would automatically yield results. Mechanistic application of cost-benefit investment appraisal techniques that overlooked factors such as governance and behavioral responses often led to unrealistic evaluations, which in turn

often ended up associated with failed projects, without any *ex post* effort to understand whether the problem was a failure in the cost-benefit methodology or in the project itself.

The main point I want to draw from this brief history and critique is simple: moving away from straight cost-benefit analysis to widen our perspective did not automatically resolve these difficulties. Several themes running across the sessions illustrate this, and also point us toward how we can move forward.

First, the link between *infrastructure and growth*. In earlier cost-benefit analysis, the investment-growth link occurred at the micro level – each investment project generated output or income growth, often without any anticipated impact at the macro level. But the scope of our interest is now broader – the case for increased infrastructure investment must be built on its expected macro impact on growth and ultimately poverty reduction. Yet our understanding of exactly how this linkage works remains incomplete, empirical evidence of its magnitude is not very robust, and the policy implications are unclear. As **Antonio Estache** noted, there is growing evidence that infrastructure matters to growth *at the macro level*, but much less clarity on how this translates into sectoral priorities, or the pragmatic needs of policymakers to target interventions to lagging regions or address rural-urban divergence. This theme was echoed in the empirical studies reviewed by **Per Pinstруп-Andersen**, which generally found a positive link between infrastructure – such as investment in roads – and agricultural productivity, and in the correlation between growth performance and physical infrastructure investments to improve “connectivity” discussed by **Liqun Jin**.

Second, striking the right balance between *public and private involvement*, a debate which was largely absent from the cost-benefit approach. As already noted, the prevailing wisdom on the appropriate role for public and private sectors has swung between extremes – from the dominance of state-controlled and financed activities several decades ago (in the golden

era of cost-benefit analysis), to the more recent enthusiasm and optimism regarding the capacity and competence of the private sector. Pure public or pure private activities were straightforward to deal with using standard cost-benefit techniques. But the current consensus is that neither of these extremes is appropriate for dealing with infrastructure needs in developing countries, and also that there will not be a single solution that fits all countries and all sectors. The critical importance of public support and/or financing emerges from the different sessions: **Liqun Jin** emphasized the role that governments must play in cross-border infrastructure even if private sector financing is used. The privatization experiences of the last decade provide ample evidence that better designed and more effective regulatory institutions are a clear priority, but the role of such “soft” institutions was completely missing from earlier cost-benefit approaches. What matters is ensuring that all elements are in place to demonstrate the commitment of both public and private partners to fair outcomes for users, investors and taxpayers, which in many countries, starts with undertaking institutional reforms which increase the accountability of all actors.

The implication of different public-private financing options was almost completely absent from the traditional cost-benefit approach, which focused primarily on the spending side of the ledger. But we now recognize that this public-private balance can matter a great deal. One lesson of the last decade is that the private provision of infrastructure is inadequate to fill the infrastructure gap – suggesting a continuing need for mixed financing vehicles, through which public and private contributions can be combined or public policies used to indirectly support private finance. But care must be exercised here as well – governments must avoid options that create open-ended financing windows or large contingent liabilities, and the level and pattern of financing provided must be carefully balanced against fiscal requirements. A related issue for the public sector is the appropriate balance between domestic and external resources – while developing countries must shoulder a substantial portion of the financing burden, as they already

do, increased aid is needed to complement public resources and accelerate infrastructure investment programs undertaken in the context of efforts to reach the MDGs.

Third, the challenge of dealing with *cross-border or global externalities*. Standard cost-benefit analysis is ill-equipped to deal with the challenge of incorporating the impact of large externalities (either positive or negative) that can occur as a result of major investments. This is evident in considering major cross-border or even national investment projects whose impact will be amplified by increasing returns or cumulative causation, as noted by **Tony Venable**. More generally, he notes that there are often large efficiency gains from making people “closer together” in an economic sense, which our standard evaluations fail to capture. Dealing with externalities becomes even more problematic when one considers the tradeoffs implicit in the long-run adaptation and mitigation climate change scenarios described by **Michael Grubb** and **Jiang Kejun** – the challenge of assessing alternative investment interventions to reduce greenhouse emissions is compounded by the difficulty in capturing externalities with global impact that unfold over decades or even centuries.

Finally, the importance of *better data and improved evaluation*. We moved away from cost-benefit analysis in part due to the enormous data demands, but the range of issues just outlined suggests a need for more and even better data. This point is critical: without systematic initiatives to expand our capacity to monitor infrastructure availability (and deficiencies) along with efforts to improve performance measurement and evaluation, there is little likelihood that the ambitious infrastructure agenda can move forward.

On *data*, the point is a simple one: creating the information base that will allow us to monitor what is happening is crucial to increasing accountability for all participants. As **Hadi Esfahani** noted, the “missing” data is in some sense part of the “missing” infrastructure we must strive to create. As we have seen in global efforts to achieve the MDGs, measuring progress – or

lack thereof – depends on having at least two data points. The annual Global Monitoring Report prepared each year to evaluate progress towards the MDGs has emphasized increasing coverage of indicators on the human development MDGs, and a similar effort is needed with regard to infrastructure. And the indicators developed should not just look at access – as has traditionally been the case – but also at affordability, as this is critical to efforts to extend the benefits of infrastructure more broadly, especially to the poor.

On *evaluation*, the argument is equally straightforward: the needs are too great and the costs of failure too large to continue allocating resources to investment projects and other interventions for which no assessment of success has been done. One analytical weakness of cost-benefit analysis is that it is impossible to incorporate all possible channels of impact, and therefore hard to be certain that the overall assessment is comprehensive. By focusing explicitly on the overall impact of policies and programs, impact evaluation techniques can help fill gaps in our understanding about which policies and interventions work and which do not. It also provides benchmarks to which projects in different settings can be compared. The impetus for an increased focus on results comes from various quarters. When donors are financing such investment programs, there is a growing focus on “aid effectiveness” that translates into a demand for quantifiable measures of progress, with donors willing to commit large sums of money only to successful programs. When governments are financing investment themselves, the pressures are no less – nearly all face substantial fiscal pressures that call for increased scrutiny and care in choosing among alternative investment options. If infrastructure is not going to be neglected, it must be better understood. Progress is being achieved through efforts – among them the DIME initiative in which the Bank is engaged. They need to be expanded and generalized to countries and multilateral and bilateral donors. Knowing what does work and what does not is a key global public good.

In summary, the progressive decline of cost-benefit analysis use in public finance and from the infrastructure literature may be explained by the formidable demands it places on data availability, on the exhaustive understanding required of economic mechanisms in a non-competitive model of the economy, and on the knowledge demanded regarding institutions and governance parameters. But as our discussions have revealed, these issues still loom large in evaluating infrastructure policies and investment choices – we just are not dealing with them in a comprehensive framework.

Moving forward, efforts are required to build up a more systematic framework for evaluating investment choices. This certainly does not mean reviving traditional cost-benefit approaches – many of the shortcomings identified earlier continue to hold. Instead, efforts must be directed towards developing data and techniques that permit applying the same type of approach to a different scale and covering a wider set of factors – for example, macro-level analyses that enhance our understanding of the structural factors and policy levers that affect success, or micro-level impact evaluation assessments that help us understand what works and what does not. And yes, there is still a need for quantitative assessment of costs and benefits that goes beyond these areas, especially with regard to choosing among projects or sectors in allocating scarce resources.

In conclusion, let me again acknowledge all of the enthusiasm and expertise that have come together to make this conference a success, and take one final opportunity to heartily thank our Japanese hosts for their hospitality and efficiency in organizing this event. We also welcome the announcement by **Ms. Sadako Ogata** that Japan plans to scale up its support for developing countries seeking to achieve the MDGs. While we will all take away our own perspectives on what the key messages have been, and what the priorities should be, I am firmly convinced that

we have helped move the infrastructure agenda ahead – and I look forward to seeing what can be achieved in the months and years to come.

Ladies and gentlemen, thank you for your attention.