TO BUILD, OR NOT TO BUILD: INFRASTRUCTURE CHALLENGES IN THE YEARS AHEAD AND THE ROLE OF GOVERNMENTS

Address to the Conference on The Economics of Infrastructure in a Globalised World: Issues, Lessons and Future Challenges

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18 March 2010

Introduction

Thank you for your invitation to speak at this conference on the economics of infrastructure in a globalised world.

Infrastructure provides a foundation for social and economic interactions. For that reason, it is of considerable interest to government. But the government's role in enabling, or directly funding, the provision of infrastructure confronts tremendous policy challenges. Your efforts to tackle these difficult issues are, therefore, very welcome.

Infrastructure poses many complexities that are not encountered in more familiar markets for goods and services. Lagged supply responses, issues of lock-in and path dependency, the prevalence of substantial positive and negative externalities, and network characteristics with widely dispersed benefits or costs all combine to make infrastructure policy especially challenging.

Thoughtful and effective competition policy is essential to quality infrastructure outcomes. However, recent experience also demonstrates the importance of long-term planning and, in particular, the governance structures surrounding infrastructure planning and financing. This experience suggests that it is likely that continued and significant institutional reform will be required, over time, to improve planning and governance arrangements in many countries, including Australia.

The need for infrastructure policy reform is magnified by the challenges associated with global climate change and changing demographics. These challenges are common to a number of countries. In addition, Australia faces unique challenges associated with a sustained mining boom and protecting for future generations a fragile environment. And while there have been some policy successes, we can always do better.

There is little doubt that large-scale economic and social infrastructure investment is required to sustain economic, environmental and social activity. But, given the complex nature of infrastructure decisions, the institutional settings within which these investments take place will be a crucial determinant of their success.

Perhaps the best way to illustrate Australia's challenges is to begin by telling the infrastructure story of the recent past; then to reflect on some of the factors shaping Australia's future economic circumstances and their relationship to infrastructure challenges;

and finally to move to some of the policy lessons for infrastructure provision.

Infrastructure planning and recent events

Prior to the Global Financial Crisis (GFC), there was a widespread view that the Australian economy was experiencing capacity constraints, in particular in the form of infrastructure bottlenecks.[1] A commonly cited symptom of these bottlenecks was a pronounced slowing in productivity growth.

There was talk of an infrastructure deficit, with the private sector providing estimates running from $445 billion to over $770 billion[2]. To put such claims in context, in 2009 there was around $274 billion of public and private business investment, representing around 22 per cent of GDP. Economic and social infrastructure is about 30 per cent of total investment or 6.8 per cent of GDP.[3] Using the upper end of these estimates, if we doubled the annual investment typically undertaken in economic and social infrastructure, it would still take over 8 years to close these suggested infrastructure gaps.

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[1] See for example, Organisation for Economic Cooperation and Development, 2008, Economic Survey of Australia, available at http://www.oecd.org/document/35/0,3343,en_2649_33733_41441891_1_1_1_1,00.html

[2], For a discussion of these estimates see Infrastructure Partnerships Australia, 2009, Financing Infrastructure in the Global Financial Crisis, available at http://www.infrastructure.org.au/Content/FinancingInfrastructure.aspx

[3] Economic infrastructure includes transport infrastructure, such as road, railways and ports; telecommunications infrastructure, such as phone lines and internet connections; energy infrastructure, such as electricity generators and power lines; water infrastructure, such as dams and pipes. Social infrastructure includes those assets devoted directly to social expenditure in areas such as schools, hospital, and libraries. The calculations include $46.9 billion in 'economic infrastructure', $11.6 billion in 'social infrastructure' and $27.2 billion in 'other infrastructure' in 2008-09.

It is also interesting to consider what people mean when they are discussing infrastructure bottlenecks, especially in a close to fully employed economy, as was Australia's case prior to the GFC. In such an economy, for bottlenecks to be resolved there has to be a reallocation of resources from existing activities to new activities and/or a more efficient utilisation of existing infrastructure.

In the period prior to the GFC, we were only really beginning to see the difficulties associated with a reallocation of resources. To some extent, the reallocation was muted by a large increase in migration.[4] In the period ahead, as capacity constraints re-emerge, we will face difficult structural challenges, with a stronger need for some industries to shrink - or at least not grow as quickly - so that others can expand.

In the period of the GFC, the concerns of a fully employed economy quickly dissipated and it seemed to many that the emerging global recession provided an ideal time to move ahead with public infrastructure provision. However, attempts to bring infrastructure online as part of fiscal stimulus packages were hampered by difficulties in finding ready-to-deliver, nationally significant infrastructure investment proposals. As it happens, such projects were not simply lying on the shelf ready to be picked-up and implemented by policy makers.

[4] Henry, K, 2009, 'The Shape of Things to Come - Address to the QUT Business Leaders' Forum' . Available at http://www.treasury.gov.au/contentitem.asp?NavId=&ContentID=1643

The Government tasked Infrastructure Australia to conduct a national audit of the nation's infrastructure in late 2008, based on a broad range of submissions from state and local governments and the private sector. The national audit shortlisted 94 projects for further examination[5], 9 of which were recommended to the Government in the context of the 2009-10 Budget, with 7 projects receiving funding.[6] [7]

The process revealed a systemic lack of long-term infrastructure planning, with major project proposals requiring significant development before they could even be assessed.

These difficulties were not unique to Australia. Other developed economies, including the United States, that pursued similar strategies faced the same difficulties. While some of the United States Government's infrastructure projects have been rolled out, many others have been subject to major delays and other difficulties. Even though a significant share of projects is still scheduled to commence, one year after the US stimulus package

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[5] Infrastructure Australia, 2008 'A Report to the Council of Australian Governments' December 2008 . Available at **http://www.infrastructureaustralia.gov.au/files/A_Report_to_the_Council_of_Australian_Governments.pdf**

[6] Infrastructure Australia, 2009, National Infrastructure Priorities, available at http://www.infrastructureaustralia.gov.au/files/National_Infrastructure_Priorities.pdf

[7] Commonwealth Treasury, 2009, *Australia to 2050: future challenges*, Intergenerational Report 2010. Available at **http://www.treasury.gov.au/igr/igr2010/default.asp**

was signed, some 70 per cent of its US$ 275 billion in stimulus grants and contracts have yet to be paid out.[8]

There is considerable scope for improvement in this area, in many countries. Improvements in planning have their own benefits, ensuring that infrastructure networks are best positioned to enhance productivity growth. And, the extent to which infrastructure projects can be brought online as "shovel ready" during cyclical downturns also has the potential to enhance the conduct of macroeconomic policy.

The mineral boom and future infrastructure demands

With the domestic economy recovering well from the global recession, the focus of debate in Australia is shifting back to emerging capacity constraints, infrastructure bottlenecks and coping with strong demand, especially from China, for Australia's mineral resources.

For some time now, I have been suggesting that the re-emergence of China and India could lead to a sustained rise in Australia's terms of trade[9] and that these changes would necessitate a structural adjustment characterised by a significant shift in our factors of production toward capital-intensive production and away from

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[8] Information available from **http://www.recovery.gov/Pages/home.aspx** an official U.S. government's official website providing easy access to data related to American Recovery and Reinvestment Act of 2009.

9 Henry, K, 'The Fiscal and Economic Outlook' (address delivered to the Australian Business Economists, Sydney, 16 May 2006), available at **http://www.treasury.gov.au/documents/1112/HTML/docshell.asp?URL=Australian_Business_Economists.htm**

labour-intensive production[10] - with important consequences for labour productivity growth.

These issues are neither trivial nor academic. They will present Australian policy makers with complex challenges for years to come. How policy makers respond to these challenges will play an important role in determining how well the Australian economy handles the reallocation of resources across different sectors of the economy.

The minerals boom also demands significant infrastructure investment, primarily in export infrastructure such as dedicated rail lines and bulk export ports. These are, of course, mostly private assets. There is also a case for public investment in infrastructure, but it is most important that government policies enable, or at least don't stand in the way, of productive infrastructure investment – whether private or public.

Demography, cities and infrastructure

While we face the challenges of successfully navigating a minerals boom, we also face the challenges of a strongly growing but ageing population.

With Australia's population set to continue to grow quite rapidly in the next 20 to 40 years, it is important that those responsible for

[10] Henry, K, 'The Shape of Things to Come' (address delivered at the QUT Business Leaders' Forum, Brisbane, 22 October 2009), available at **http://www.treasury.gov.au/contentitem.asp?NavId=&ContentID=1643**

infrastructure planning assess the pattern of Australia's settlement and the complex challenges raised by it: where and how will this growing population be located?

In 2008, and for the first time in history, the majority of the world's population lived in cities. This trend is expected to continue, with the United Nations predicting that 70 per cent of the world's population will live in cities by 2050. In Australia, the trend is well advanced, with almost 90 per cent of the population residing in urban areas[11].

I think that it is safe to say that cities have emerged as the dominant form of social organisation simply because concentrated areas of population are significantly beneficial in terms of productivity and the delivery of welfare. These benefits arise from a range of agglomeration economies: as businesses locate in close proximity to one another, they are able to share knowledge and labour inputs while also residing close to businesses and individuals to whom they sell products, resulting in high levels of specialisation that can promote productivity growth[12].

A greater degree of specialisation creates higher levels of wealth, higher incomes and increases the range of goods and services available to consumers by promoting a more efficient organisation

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[11]United Nations Population Division, 2008, *World Urbanization Prospects: The 2007 Revision Online*, United Nations Department of Economic and Social Affairs, available at http://www.un.org/esa/population/publications/wup2007/2007WUP_Highlights_web.pdf

[12] For a discussion of these dynamics see Chapter 4 of Porter, ME, 1990, *The Competitive Advantage of Nations*, Free Press, New York

of production. The concentration of population and wealth in cities facilitates the emergence of cultural and educational institutions while improving efficiency in the delivery of government services. There are also benefits for infrastructure provision in cities through economies of scale and economies of density – at least up to some point.

It would be prudent to ask whether there is a "productivity dividend" to be gained from a more efficient distribution of Australia's population,[13] and further, whether there might be an accompanying urban amenity dividend to be realised through improved organisation, and possibly higher densities, of Australia's cities.

Australia presently has some of the highest levels of urbanisation in the world, but with very low levels of density[14]. This combination of high urbanisation and low density is illustrated by statistics showing that Australia has a relatively large average home size, with the average floor size of new houses having increased significantly during the past 25 years.[15] According to the Commonwealth Bank, Australia has an average house size of 215 square metres,

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[13] Marceau, J, 1999, 'The Disappearing Trick: Clusters in the Australian Economy' in Organisation for Economic Cooperation and Development, 1998, Boosting innovation: The cluster approach, OECD Proceedings, Paris.

[14] For example Sydney is the world's 56th largest city but ranks 113th by measures of density. Information from Australian Bureau of Statistics, 2006Census of Population and Housing. Available at, http://www.abs.gov.au/websitedbs/d3310114.nsf/Home/census , and City Majors, The largest cities in the world by land area, population and density (2007), http://www.citymayors.com/statistics/largest-cities-density-250.html, accessed 17 March 2010.

Commonwealth Treasury, 2009, *Australia to 2050: future challenges*, Intergenerational Report 2010. Available at **http://www.treasury.gov.au/igr/igr2010/default.asp**,

[15] Australian Bureau of Statistics,various, Building Approvals, Australia, cat. no 8731.0, ABS, Canberra. http://www.abs.gov.au/ausstats/abs@.nsf/mf/8731.0

compared with the USA at 202 square metres, and New Zealand at 196 square metres. There is then a fair gap to the next group of countries analysed, led by Denmark at 137 square metres.[16] So policy makers might want to ask what incentives in our current arrangements have led Australian cities to develop as they have, and are there better ways to plan and organise Australia's cities?

Providing impetus for such a consideration, the Treasurer recently released the third Intergenerational Report (IGR), which presented scenarios for future population growth. The IGR projects that Australia's population could be around 36 million people by 2050 compared to around 22 million people now.

Treasury projections indicate that much of this growth is likely to occur in Australia's cities. Sydney and Melbourne are projected to grow in size to around 7 million people by 2050, Brisbane is projected to grow to around 4 million people and Perth is projected to grow to nearly 3½ million people by 2050.

If we get the institutional arrangements surrounding the provision of infrastructure to cities right, is it possible that we could have a city of 10 million, as observed elsewhere in the world? And might this actually be a good thing?

For example, if we are able more intelligently to plan our cities with supporting infrastructure in the form of utilities and transport

[16] James, C, 2009, 'Australian homes are biggest in the world - Housing market trends'. A Comm Sec Economics Economic Insight Series 30 November 2009, http://images.comsec.com.au/ipo/UploadedImages/craigjames3f6189175551497fada1a4769f74d09c.pdf.

networks that were designed carefully and priced accurately, could it be that the per capita consumption of natural resources would actually be significantly decreased?

Getting it right with cities and infrastructure has significant potential, not just from a pure economic perspective, but also from a social and environmental sustainability perspective. Getting it wrong is likely to be very costly socially and environmentally. It is easy to observe some undesirable outcomes already manifest in some of Australia's cities, with inadequate infrastructure and chronic congestion.[17]

Australia is not the only country experiencing considerable challenges in urban amenity. The fact that the majority of the world's population now live in cities has come about largely as a result of developments in China and India. China, for example, is urbanising at a rapid pace and currently has over 100 cities with a population of more than 1 million, including two cities with a population over 10 million; one of these is Shanghai, which has more than 15 million residents.[18] Yet less than 50 per cent of China's population resides in urban areas. The challenges many developing countries face with rapid urbanisation are immense and their success in meeting these challenges will be important, not only

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[17] Bureau of Transport and Regional Economics, 2007, *Estimating urban traffic and congestion cost trends for Australian cities*, Working Paper No. 71, Available at **http://www.bitre.gov.au/publications/49/Files/wp71.pdf**

[18] United Nations Population Division. 2008. *World Urbanization Prospects: The 2007 Revision* Online. The United Nations Department of Economic and Social Affairs. Available at http://www.un.org/esa/population/publications/wup2007/2007WUP_Highlights_web.pdf, accessed 16 March 2010

for the global response to climate change but also productivity growth.

The challenges of infrastructure and their connection to productivity growth

For both the public and private sectors, decisions to fund or provide infrastructure are especially difficult. Infrastructure assets are typically large fixed assets with significant capital costs; they take a long time to construct and, are effectively irreversible. As infrastructure assets can also have important network features and generate significant positive and negative externalities, choices can lock-in, determining a network of transaction costs that then shape patterns of trade for a long time.

These realities often create particular difficulties for private infrastructure investment; there are high risks when infrastructure investment goes wrong, and the presence of positive externalities means that investment may be lower than is socially desirable. Overlay these difficulties with the strategic behaviour of existing private providers in limiting new entry and sovereign risk that may accompany instability or uncertainty in the public institutions that are designed to support infrastructure investment and you have a recipe for chronic underprovision.

However, governments should have no illusions that simply building more infrastructure is a panacea for these problems. Putting in place effective institutions to support the private market is essential.

There remains an important role for public investment in infrastructure. There may be infrastructure projects that are of strategic importance and that may not pass a private cost-benefit analysis; perhaps because the costs and benefits need to be amortised over too many decades or for other reasons. Intelligently conducted cost benefit analysis can deal with such issues. They should be the prime guide of public infrastructure decisions.

In undertaking cost-benefit analysis, consideration of the theoretical advances that shed light on the connection between infrastructure and productivity growth can be particularly helpful. I note that this conference has been considering developments in international trade theory and spatial economics. These ideas shed light on the momentum towards urbanisation. They also provide new insights into the benefits of infrastructure and, in particular, the presence of increasing returns, clusters and agglomeration economies.

For example, we traditionally value the construction of a road between two cities based on the reduction in transport costs that it yields for households and businesses, and we set this against the cost of construction. However, the predominant benefits may arise from dynamic productivity gains, including the economies of scale to which transport costs are subject, and the integration of two connected markets across which goods can be traded.[19]

[19] Krugman, P, 1991 'Geography and Trade'. Leuven University Press, Belgium, page 24.

As Adam Smith noted, the level of specialisation in a market is driven by its size, or to quote him more accurately "the division of labour is limited by the extent of the market".[20] Larger integrated markets, which infrastructure can help create, may generate higher levels of specialisation and innovation. Larger markets also potentially open up opportunities for more competition.

In this paradigm, governments can play an important role in the wealth creation process, facilitating productivity growth through creating the conditions for integration and specialisation, by getting infrastructure and planning decisions right.

This suggests that there might be a positive relationship between public and private infrastructure investment, with some types of government infrastructure investment improving the marginal returns to private investment, or increasing its scope.

Some preliminary empirical analysis undertaken by colleagues at the Treasury suggests that in Australia there is a crowding-in effect from public to private investment. This analysis suggests that the two types of investment are complementary, though, as you would expect, public investment has the greatest effect on private investment when the economy is operating below potential and

[20] Smith, A (1776) 'An inquiry into the nature and causes of the Wealth of Nations' ed. A.S.Skinner, London Penguin Books, page 121.

there is less likelihood of it competing resources away from private investment.[21]

The Policy lessons

What is clear from the accumulated evidence is that public infrastructure is not a panacea for all that ails economies, but rather a form of capital that when deployed properly, can be effective in enhancing growth and well-being. To deliver these outcomes there are two important elements for government to consider. First, the need for infrastructure investment to take place in carefully designed and planned networks. Second, the promotion, in public and private infrastructure markets, of competition.

Government has an important role to play in enabling planning and providing a coordination and organising function. For example, governments and their institutions can coordinate the delivery of a city's infrastructure assets by ensuring that projects with high positive externalities are constructed, with land set aside in advance. One should not have to consider the possibility, for example, that you would plan to construct an airport in a major residential area.

For this reason, some major international cities have a metropolitan level planning authority, which coordinates planning and development. Mega cities, such as London, Tokyo, and New York,

[21]Liu, Lo and Morling (2010) Public and Private Investment in Australia: Crowding in or crowding out? Treasury 'unpublished working paper in progress'

all have metropolitan planning authorities, which underwrite their city's amenity and productivity. There have been recent calls for similarly empowered bodies in Australia.

Noting the idiosyncrasies that various infrastructure markets face and the challenges that these create for policy makers, institutional frameworks can enhance the productivity benefits of infrastructure through thoughtful planning, as well as innovation in institutional design. Infrastructure Australia is an important step in the right direction.

Infrastructure Australia will be complemented by reforms that help the three tiers of government to work together so that they can deliver quality infrastructure outcomes. And while, in the future, reforms to governance structures may be necessary, the establishment of Capital City Strategic Plans provides a way forward; promising to facilitate cooperation between tiers of government while enhancing accountability and transparency in state planning processes.

Of course, in designing governance arrangements for planning and building infrastructure, we should keep in mind that there is considerable potential for incumbent actors to manipulate arrangements (and the public debate) in order to create economic rents.

The complications and mass of regulations, although well intentioned, can serve the interests of incumbent rent seekers, with

the direct costs being paid by the broader public – with a particular concentration of these costs among those less well off. There is a tremendous capacity for well intentioned planning and regulation to become a barrier to entry, insulating incumbents from competition.

We may well be observing such an example in the housing affordability debate. Consider the complexity of planning, zoning, and approval processes involved in property development; the maze of regulations which are often idiosyncratic to each local council, and involving multiple departments and acts of parliament; the uncertainty and delays in determining approvals and charges; high costs of compliance and scope for discretionary political interference. One wouldn't be surprised if all of this led to a market dominated by few players, with participants restricted to those having the necessary scale to cover the considerable compliance costs and risks involved.

Some of you may wonder why I have stressed the importance of institutions this evening and devoted less attention to the role of the price mechanism. This is not because the price mechanism is not important; instead, that price signals can coordinate activity more efficiently when they have support from appropriate institutional frameworks.

In fact, given the complexity faced by governments in infrastructure decisions, one might argue there is even more reason for the government to design markets such that the private sector can play the maximum role possible. For example, I can see no reason why,

with well-designed markets, regulation and institutions, we can't see the private sector dominate the delivery of energy, water and transport. These are all areas capable of supporting well functioning markets with price signals as the predominate mechanism for encouraging efficient investment and use. And, in fact, we are well down this road in a number of areas; for example, with the national electricity market.

Such arrangements allow governments to focus on enabling other markets to function effectively, intelligently providing social infrastructure that directly addresses market failures. It also frees governments to undertake high quality analysis about future infrastructure needs; social and environmental externalities; and the potential for positive network externalities.

But we should not underestimate the difficulties ahead. As economists, we might regularly cite the great example of congestion charging in London. But there are considerable difficulties in bringing such reforms to fruition, with an event in London's northern neighbour, Manchester City, giving us pause for thought on a number of fronts. A referendum on the introduction of a congestion charge for the residents of Greater Manchester, was defeated by 79 per cent to 21 per cent.

It is not entirely clear why the proposal for a congestion charge was rejected so decisively, especially as congestion charging has been such a success in London, though anecdotal evidence suggests

that Manchester City residents perceived it simply as a revenue raiser, rather than an opportunity to alleviate congestion.

Surveys of the public's attitudes towards congestion charges indicate that the London congestion charge appears to have received a more favourable acceptance because it hypothecates revenues from the charge towards increased bus services and provides tax deductions for bikes purchased to replace car based commuting.[22]

Conclusion

The recent policy responses to the global financial crisis exposed a need for improvement in infrastructure planning and development; in particular, to enhance the scope for infrastructure construction to be deployed as an instrument of counter-cyclical macroeconomic policy.

However, it also exposed a lack of strategic planning for the nation's infrastructure needs. There have been important first steps in improving this situation, such as the development of a pipeline of projects with cost-benefit analysis by Infrastructure Australia and a recent focus on city strategic plans. But we need to do more, including improving the operations of infrastructure markets by promoting more effective competition. It is also critical that we get the governance and regulatory structures accompanying

[22] K.T. Analytics, Inc.(2008) 'Lessons Learned from International Experience in Congestion Pricing. Final Report' prepared for U.S. Department of Transportation, Federal Highway Administration. Sections 2-1 and 3-1. Available at http://ops.fhwa.dot.gov/publications/fhwahop08047/intl_cplessons.pdf

infrastructure right, paying very close attention to potential unintended consequences.

The public policy goal should be the sustainable enhancement of wellbeing.

Sadly, there have been many failures for well over 100 years in Australia to develop policies to promote sustainable activity. This is strikingly evident in the dramatic loss of native species and biodiversity. This most significant example should motivate us not only to solve the complex and difficult problems associated with the intersection of public infrastructure policy and private endeavour, it should also motivate us to put in place policies and governance structures that are truly focussed on a sustainable future.

I would note, as I have on previous occasions, that productivity, properly understood, is not in conflict with sustainable growth. Indeed, I would argue that productivity enhancement that is not consistent with sustainable growth would simply point to a major methodological deficiency in our measurement of productivity.

Thank you.