Interview with Dr. Juzhong Zhuang, Deputy Chief Economist and Deputy Director General, Economic Research and Regional Cooperation Department, Asian Development Bank

Academic Overview of Asia's Infrastructure Needs — ADB Expert Discusses 2017 Report

By *Japan SPOTLIGHT*

Infrastructure is a key to overcoming impediments to economic growth in Asian countries. How much they will need to spend on infrastructure and how they can achieve it are crucial questions to be addressed in policy discussions on consolidating their growth potential. Besides economic growth, there are other challenges to be met by infrastructure such as global climate goals and reduction of income inequality. With the aging of societies as well, Asian nations will need to pursue an economically efficient way of spending government budgets for infrastructure building with increasing constraints due to pressure to increase social welfare expenditures.

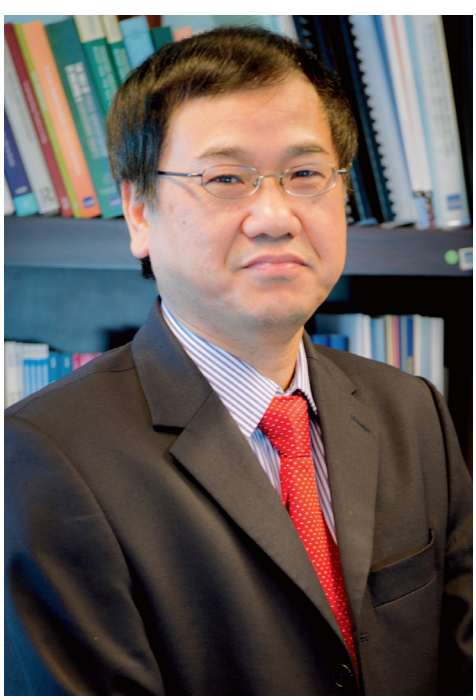
Dr. Juzhong Zhuang, deputy chief economist and deputy director general of the Economic Research and Regional Cooperation Department at the Asian Development Bank (ADB), kindly responded to the following questions via e-mail in our interview.

(Interviewed on July 25, 2017)

Self-Introduction

JS: Could you please briefly introduce yourself, in particular your research history in the ADB or other institutes?

Zhuang: I joined the ADB in 1997 and I am currently deputy chief economist and deputy director general of the ADB's Economic Research and Regional Cooperation Department. My research focuses on Asian development, and my latest publications include the co-edited books *Inequality in Asia and the Pacific* (Routledge, 2014) and *Managing Middle Income Transition: The Challenges Facing China* (Edward Elgar, 2015). In 1992-1997, I was a research officer of the Development Economics Research Program at the London School of Economics. I hold a Ph.D. in Economics from the University of Manchester.



Juzhong Zhuang, Deputy Chief Economist and Deputy Director General, Economic Research and Regional Cooperation Department, Asian Development Bank

Introduction of ADB Report on Infrastructure

JS: Could you tell us about the background of your publication *Meeting Asia's Infrastructure Needs*? Do you have any particular reason why you set 2030 as a target year in this report?

Zhuang: The ADB published a study in 2009, *Seamless Asia*, providing estimates of developing Asia's infrastructure investment needs in 2010-2020. According to that study, the region needed a total of $8 trillion in infrastructure investment (in 2010 prices) from 2010 to 2020. Our new report provides an update of the region's infrastructure investment needs, for 2016-2030. Why do we update the estimates? We have the following two reasons.

(1) When the 2009 report was published, the world was still in the midst of the global financial crisis. Eight years on, the picture is clearer. Developing Asia is still growing robustly, and is expected to continue to do so. Asia's infrastructure will need to keep pace with this continued expansion. It is important and useful to have updated figures.

(2) We now have a better understanding and appreciation of climate change and its impact, after the 2015 Paris Agreement which sets a climate goal of keeping the global mean temperature increase below 2°C above the pre-industrial level. Infrastructure has a key role

TABLE 1

Table 1: Estimated Infrastructure Investment Needs by Region, 45 DMCs, 2016–2030

Region/Subregion	Projected Annual GDP Growth (%)	2030 UN Population Projection (billion)	2030 Projected GDP Per Capita (2015 $)	Baseline Estimates ($ billion in 2015 prices)			Climate-adjusted Estimates** ($ billion in 2015 prices)		
				Investment Needs	Annual Average	Investment Needs as % of GDP	Investment Needs	Annual Average	Investment Needs as % of GDP
Central Asia	3.1	0.096	6,202	492	33	6.8	565	38	7.8
East Asia	5.1	1.503	18,602	13,781	919	4.5	16,062	1,071	5.2
South Asia*	6.5	2.059	3,446	5,477	365	7.6	6,347	423	8.8
Southeast Asia	5.1	0.723	7,040	2,759	184	5.0	3,147	210	5.7
The Pacific	3.1	0.014	2,889	42	2.8	8.2	46	3.1	9.1
Asia and the Pacific	**5.3**	**4.396**	**9,277**	**22,551**	**1,503**	**5.1**	**26,166**	**1,744**	**5.9**

Note: * Pakistan and Afghanistan are included in South Asia. ** Climate change adjusted figures include climate mitigation and climate proofing costs, but do not include other adaptation costs, especially those associated with sea level rise.
Source: 2015 Revision of World Population Prospects, United Nations; ADB estimates.

to play in ensuring that the global climate goal is met. Our updates incorporate climate mitigation and adaptation needs.

Estimations

JS: How do you estimate the infrastructure investment gap, the difference between investment needs and current investment levels?

Zhuang: In our report, the infrastructure investment gap is defined as the difference between infrastructure investment needs and developing Asia's current infrastructure investment levels. The report provides two sets of estimates of infrastructure investment needs: the baseline estimates and climate-adjusted estimates. The baseline estimates are based on the relationships between each type of infrastructure and a set of economic (such as per capita GDP, GDP growth, and the sectoral structure of an economy) and demographic (such as population size, and share of urban population) variables. The climate-adjusted estimates are the sum of baseline estimates and climate mitigation and proofing costs. Climate mitigation costs are estimated from a global energy optimization model by comparing the scenario of meeting the 2°C global climate goal with that of business-as-usual. Climate proofing costs are estimated on the basis of country and ADB experiences. The report focuses on four types of infrastructure: (1) power, (2) transport, (3) telecommunications, and (4) water and sanitation.

JS: How much do you think developing Asia will need to invest per year to maintain growth momentum until 2030? How much economic growth per year do you assume in your calculation?

Zhuang: Our estimation shows that, for developing Asia as a whole (covering 45 ADB developing member economies), the total infrastructure investment needs in 2016-2030 (15 years) would be $26.2 trillion (in 2015 prices), adjusting for climate mitigation and proofing needs, or $1.7 trillion per year. This is equivalent to 5.9% of the projected GDP for the region. According to the baseline estimates (without considering climate mitigation and adaptation needs), the total needs in the 15-year period would be $22.6 trillion, or $1.5 trillion per year. This is equivalent to 5.1% of GDP. In our estimation, we assume that developing Asia will grow 5.3% annually in 2016-2030. In comparison, developing Asia grew 7.6% annually in 2000-2015.

JS: Can you tell us about the investment needs by sector or region? In particular, how do you assess the need to respond to climate change?

Zhuang: Infrastructure investment needs vary across sub-regions and sectors. Across sub-regions, focusing on the climate-adjusted estimates, East Asia will have the largest annual needs in absolute level: $1.07 trillion, followed by South Asia at $423 billion, Southeast Asia at $210 billion, Central Asia at $38 billion, and the Pacific at $3 billion. However, in terms of percentage of GDP, the Pacific has the highest needs at 9.1%, followed by South Asia at 8.8%, Central Asia at 7.8%, Southeast Asia at 5.7%, and East Asia at 5.2% *(Table1)*.

TABLE 2

Table 2: Estimated Infrastructure Investment Needs by Sector, 45 DMCs, 2016–2030
($ billion in 2015 prices)

Sector	Baseline Estimates			Climate-adjusted Estimates			Climate-related Investments (Annual)	
	Investment Needs	Annual Average	Share of Total	Investment Needs	Annual Average	Share of Total	Adaptation	Mitigation
Power	11,689	779	51.8	14,731	982	56.3	3	200
Transport	7,796	520	34.6	8,353	557	31.9	37	–
Telecommunications	2,279	152	10.1	2,279	152	8.7	–	–
Water and Sanitation	787	52	3.5	802	53	3.1	1	–
Total	**22,551**	**1,503**	**100.0**	**26,166**	**1,744**	**100.0**	**41**	**200**

Note: – denotes not applicable.
Source: ADB estimates.

Across the four sectors, focusing on climate-adjusted estimates, the power sector has the largest investment needs, at $982 billion annually, accounting for 56.3% of the total needs. The transport sector has the second-largest needs, at $557 billion, accounting for 31.9%. Telecommunications need $152 billion, accounting for 8.7%; and water and sanitation investment needs would be $53 billion, accounting for about 3.1% *(Table2)*.

JS: How big are the infrastructure investment gaps?

Zhuang: To estimate the infrastructure investment gaps, we first estimate the current infrastructure investment in 2015, using the government budget data on infrastructure investment in the four sectors and the World Bank's Private Participation in Infrastructure (PPI) data base, focusing on 25 developing Asian economies where comparative data are available. In 2015, the 25 countries spent $881 billion on infrastructure investment in the four sectors (power, transport, telecommunications, and water & sanitation). A large part was spent by China, at $686 billion. The other 24 countries spent $195 billion. For the 25 countries, the annual needs in 2016-2020 are $1.34 trillion, which will give an annual gap of $459 billion, or 2.4% of GDP. Without China, the annual needs in 2016-2020 would be $503 billion, which will give an annual gap of $308 billion, or 5% of GDP.

Business & Government Work Sharing

JS: What do you think about work sharing between business and government to achieve your infrastructure investment goal?

Zhuang: How to bridge these gaps? The report first looks at how much more the public sector can spend on infrastructure investment for each country. The difference between the gap and additional public sector financing gives the additional private financing needed to close the gap.

To estimate additional public sector financing for infrastructure that governments can raise, the report uses fiscal space analysis, by looking at the potential for increasing tax revenue through tax reforms, spending re-orientation such as reducing general fuel subsidies, and prudent public sector borrowing. The report shows that most economies among the 25 which we focus on have fiscal space to increase infrastructure investment through these measures.

Assuming half of the additional fiscal space will be used for infrastructure investment (another half will be used for other public spending needs such as education and health), for the 24 economies, without China, the report shows that the public sector has the potential to increase infrastructure investment by $121 billion per year in 2016-2020. This will leave a gap of $187 billion for additional private financing to fill. That is to say, to close the investment gap for the 24 countries, the public sector has the potential to increase financing from the current $132.6 billion to $254 billion, and the private financing will have to increase from the current $62.5 billion to $250 billion.

Contribution of Fiscal Reform & Public Private Partnerships (PPPs)

JS: How do you think the relevant nations' fiscal reforms would contribute to generating additional fiscal revenues, a possible mitigation of budget constraints in response to meeting the growing need

for infrastructures?

Zhuang: Fiscal reforms will be critical for generating additional fiscal space in many Asian countries. The report highlighted four reform areas: (1) Tax reforms: many countries' tax revenues as a percentage of GDP are still low, and there is potential to increase tax revenues by a couple of percentage points of GDP through reforming tax systems to broaden the tax base and at the same time improving tax administration. (2) Spending reorientation, for example, by reducing general fuel subsidies. Many countries in Asia have made significant efforts to reduce general fuel subsidies in recent years, but there is room for further reducing the subsidies. General fuel subsidies benefit the rich more than the poor and they also encourage the inefficient use of energy. General subsidies can be replaced by targeted measures to protect the poor. (3) Prudent borrowing: some Asian countries have room for public sector borrowing given their still moderate public debt as a share of GDP. (4) In addition, governments can also try to generate more non-tax revenues, for instance, through means of land value capture and user charges.

JS: What kind of reforms do you think would be necessary to make infrastructure investment feasible and more attractive for private business? Would PPPs be the most appropriate way to achieve your investment goal?

Zhuang: The public sector alone will not be able to close the infrastructure investment gap in developing Asia. Private sector participation will be critical. In promoting private sector participation in infrastructure investment, countries will have to make continued efforts to (1) create a conducive investment climate, by ensuring adequate investor protection, maintaining political and macro-economic stability, introducing sound market regulation and promoting good governance; (2) deepen capital market development including local currency bond markets; and (3) promote PPPs. To promote PPPs, some countries have introduced PPP laws, streamlined procurement and bidding processes, improved dispute resolution mechanisms, and set up independent PPP units. Asian countries should share knowledge and experiences in promoting PPPs with each other. The ADB recently set up an Office of Public-Private Partnership to help its developing member countries make greater use of PPPs in infrastructure development. It is also important that Asian countries continue to build capacity for planning, designing and executing infrastructure projects.

Role of Multilateral Development Banks (MDB)

JS: How do you assess the role of multilateral development banks, in particular the ADB, in achieving your goal?

Zhuang: MDB financing of infrastructure in developing Asia in recent years amounted to about 2.5% of total actual infrastructure investment spending. But excluding China and India, the two largest economies in the region, MDB infrastructure financing in developing Asia amounted to more than 10%. Going forward, MDB finance for infrastructure is expected to rise. For instance, the ADB is to scale up its annual loan and grant approvals from $17.5 billion in 2016 to more than $20 billion by 2020. 70% of the ADB's total sovereign operations will be for infrastructure, with a growing share going to the private sector. The ADB contribution to infrastructure development goes much beyond providing financing. The ADB blends finance with expertise and knowledge, and supporting policy reform, and promoting regional cooperation.

Achieving Inclusive Growth

JS: How do you think your infrastructure investment goal would contribute to mitigating poverty and achieving inclusive growth?

Zhuang: Infrastructure plays a critical role in economic development, as a key factor of production, an important enabler of trade and investment, a key driver of productivity growth, and essential public services. Numerous empirical studies have shown that infrastructure supports not only economic growth but also poverty reduction by creating jobs and providing access to essential public services by the poor. JS

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