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The Importance of Infrastructure Bond Market Development in Asia

Background

The Asian Development Bank, ADB, (2017) says that infrastructure demand in Asia is estimated to be approximately USD 26 trillion from 2016 to 2030 or USD 1.7 trillion per year. However, rising fiscal burdens in the post-crisis period and falling bank lending under Basel III have widened funding gap for infrastructure projects and consequently renewed the attention to private participation in infrastructure financing in order to boost infrastructure developments in the region. Behind the efforts to facilitate private participation in infrastructure projects is also the region's relatively high economic growth.

To bridge the widening funding gap in Asia, local currency bond financing for infrastructure is becoming an alternative avenue for infrastructure financing. Large financing gaps and the advantages of bond financing for long-term infrastructure projects provide an impetus for the development of long-term, local currency bond markets and therefore the rationale for the Asian Bond Markets Initiative (ABMI). In this context, ASEAN+3 governments pro-

posed a study exploring new debt instruments for infrastructure financing at the 10th ASEAN+3 Finance Ministers' Meeting held in Kyoto in May 2007.

Bonds also would be suitable financial products for institutional investors with long-term liabilities such as pension funds and insurers, which are moving toward increasing allocation into infrastructure largely due to the current low interest rate environment. It is expected that the emergence of institutional investors in Asia will further spur the development of infrastructure bond markets as major investors of infrastructure bond.

Bond Financing for Infrastructure

Usually, an infrastructure company carries out an infrastructure project by setting up a special purpose company (SPC) through which to raise capital. From the perspective of financing, equity capital mostly consists of investments from construction companies or infrastructure funds while debt capital includes infrastructure bonds or loans from various financial institutions such as international organizations, public and private financial institutions, etc. In

some cases, the operation company directly raises capital by issuing stocks or bonds. The issuance of general obligation bonds is based on the credibility of the company and is different from that of infrastructure (project) bonds that are based on the future cash flows from a specific project.

Each stage of an infrastructure project has different risks and expected returns, and thus requires a different financing method. During the early stage of planning and construction (greenfield), equity investments and bank loans represent a primary part of financing. Once the project enters the mature stage (brownfield) and creates stable cash flows, capital can be raised via bond issuance. And the participation of international organizations or state-owned banks can help an infrastructure project enhance its viability and thus facilitate financing of large-scale and long-term capital. However, when these public sources are used, Hyun, Nishizawa and Yoshino (2008) insist that it is critical to design a risk-sharing mechanism to prevent moral hazard and to strike a balance between the public nature of a project and its commercial viability that is an incentive for private sectors.

Traditionally large banks in developed countries remain major financiers to emerging countries. According to the World Economic Forum (2014), commercial banks provided an estimated 90% of all private debt for infrastructure financing from 1999 to 2009. However, banks with short-term liabilities are not suitable to hold long-term assets on their balance

sheets. Under Basel III, the regulatory capital burden is increasing particularly on illiquid long-term assets for infrastructure projects by banks. And revenues from infrastructure projects are generated in local currencies while the major financing sources are provided in foreign currencies by foreign banks. In this case, hedging can be one solution for mitigating currency risk. However, hedging cost would be very high because hedging markets are illiquid in most Asian countries. These situations might pose the problem of a double mismatch, in maturity and currency, in infrastructure financing as experienced in Asian financial crisis in 1997-1998.

Therefore it is critical to nurture infrastructure bond markets in order to raise long-term, large-scale capital and to fill the gap created by commercial banks' reluctance to extend loans under Basel III. Infrastructure bonds are defined as bonds issued to finance the infrastructure projects of public interest such as railways, toll roads, airports and so on. The scope of infrastructure also has evolved significantly, covering a broad range from traditional infrastructure such as power, oil and gas, water as well as hospitals, schools, and prisons to low-carbon, climate resilient infrastructures such as renewable energy.

By nature, principal and interest payments on infrastructure bonds are based on a stream of cash flows from projects, instead of issuer's credibility. Hence, such bonds require an independent, differentiated evaluation method that takes into

account uncertain cash flows in the future. Infrastructure bonds are closely associated with the development bond markets and therefore primarily issued in developed markets and euro markets that are equipped with appropriate conditions, e.g., the US, Europe, Australia, Canada, and etc.

Infrastructure Bond Market Development in Asia: Comparison with Europe

Although local currency bond financing can plug large financing gaps and finance long-term infrastructure projects in Asia, the Asian infrastructure bond market is in a nascent stage with a meager size of bond issuance compared to the large amount of investment required. Then what makes local currency bond financing difficult for infrastructure projects in Asia?

Ehlers, Packer and Remolona (2014) explain the reason why bond financing is difficult as follows. Firstly, infrastructure projects are complicated and require highly specialized expertise from both governments and investors. Secondly, there are some risks inherent in infrastructure projects which cannot be controlled by sponsors. Thirdly, bond financing has

co-movement between bond market and infrastructure bond market. Lastly, the lack of depth and liquidity of domestic local-currency bond markets makes bond financing difficult. Therefore, infrastructure bond markets are closely related to bond markets in general. The development of domestic local currency bond markets will consequently facilitate further bond financing of infrastructure projects in Asia.

ADB (2015) reviews extensively the recent experience of infrastructure bond markets in Asia and the lessons from other markets such as revenue bonds in the US and Project Bond Initiative (PBI) in the EU where infrastructure bonds are commonly used. Therefore I attempt to compare infrastructure bond market in Asia and that in Europe in order to address fundamental challenges in developing the infrastructure bond market in Asia, and to derive implications and lessons from Europe's experience.

To understand the difference between Asia and Europe, Table 1 reports the mean standard deviation, and number of observations for all variables in the sample period of 2003-2015 with 29 countries.*¹ As seen from the table 1, the variables are significantly different between regions, Asia and Europe. As seen from the figure 1 and table 1, we know obviously that countries in Europe had relatively developed infrastructure bond markets with average issuance 11.7% of GDP while Asia showed a comparatively small issuance with 6.8% of GDP. As Eichengreen and Luengnarue-mitchai (2006) insist, economic size is

Table 1: Descriptive Statistics related to Infrastructure Bond Markets in Asia and Europe

	ASEAN+3			Europe		
	Mean	Standard Deviation	OBS	Mean	Standard Deviation	OBS
Bond/GDP (%)	6.845	(8.75)	143	11.730	(21.33)	221
lnGDP	26.487	(1.84)	143	26.857	(1.33)	221
ln(GDP per capita)	9.567	(0.97)	143	10.608	(0.27)	221
General government balance (% of GDP)	-0.963	(3.74)	143	-2.756	(4.10)	221
Inflation (of GDP deflator, %)	3.888	(4.71)	143	1.656	(1.43)	221
Volatility of the FX rate	1.271	(0.70)	117	0.724	(0.50)	221
Domestic credit by banks (% of GDP)	94.188	(48.03)	138	118.837	(43.48)	221
Average institutional factors	48.031	(24.28)	143	78.289	(12.13)	221
Property index	48.636	(28.10)	143	81.425	(13.43)	221
Corruption index	46.577	(24.54)	143	75.095	(15.62)	221
Investment Freedom	48.881	(22.90)	143	78.348	(12.23)	221

Note: OBS=observations; GDP and GDP per capita are transformed to their natural logs

Source: Dealogic, Bloomberg, BIS, World Bank, IMF, Heritage Foundations

positively related to bond market development because the small and fragmented economies in Asia may lack the minimum efficient scale needed for deep and liquid bond markets.

Asia's small economic size and large discrepancy in economic development are reflected in the small means and large standard deviations on the economic variables for the region compared to those for the European region. This might impede the further development of infrastructure bond markets with liquidity and depth. For the variables measuring institutional factors, such as the corruption freedom index, the property index, and the investment freedom index, the means for Europe are higher than those for Asia, which indicates a more favorable environment for infrastructure financing for Europe. Therefore, low values on the property index, corruption index, investment index also are critical barriers to financing infrastructure projects through bond markets in Asia.

Lessons from European Experience: Project Bond Initiative (PBI)

The PBI was created in response to the global financial crisis and subsequent debt crisis in Europe, which has led to a reduction in financing options for infrastructure projects. Traditional funding options such as public sector debt have become less important in the wake of the European debt crisis. In addition, more stringent capital adequacy requirements under Basel III have made bank loans less preferable. The PBI aims to provide partial credit enhancement to infrastructure bonds in order to attract more investors.

As seen from Figure 2, most infrastructure bonds in our sample have been rated by at least one of three international rating agencies such as Fitch, Moody's and S&P in order to assess the importance of country risks. When we chart the distribu-

tion of issues by average rating, the share of infrastructure bonds rated AA or above is about 52% in Europe, while only about 16% of infrastructure bonds in Asia are rated AA or above (Figure 2). About 57% of infrastructure bonds in Asia are rated A. Meanwhile, BBB-rated (investment grade) infrastructure bonds are also frequently issued to finance infrastructure projects in Europe.^{*2}

Asian infrastructure bond issuance poses a challenge to corporate issuers because their credit ratings are lower than those of their respective governments considering the region's low sovereign ratings, which consequently raises the cost of debt financing. Therefore, preferential treatment for Asian local currency bond markets through credit enhancement policies is required to bridge the rating gap. As an example, credit enhancement by the European Investment Bank increases the ratings of infrastructure bonds and thereby decreases funding costs on projects in the region.

Credit enhancement programs in Asia can facilitate infrastructure bonds issuance by providing Asian investors with higher rated bonds. The ABMI's Credit Guarantee and Investment Facility (CGIF) is expected to help bridge this gap. Howev-

Figure 1: Infrastructure Bonds Size/GDP

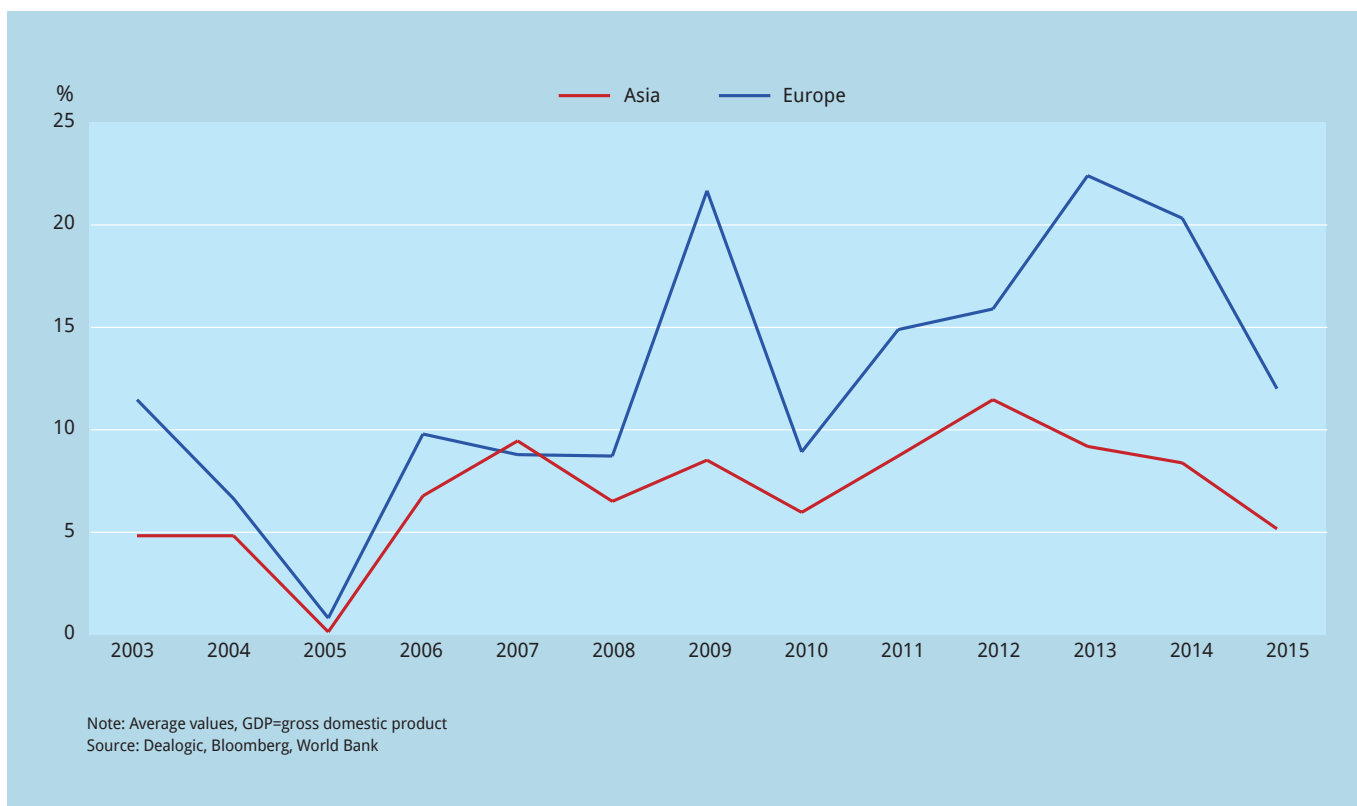
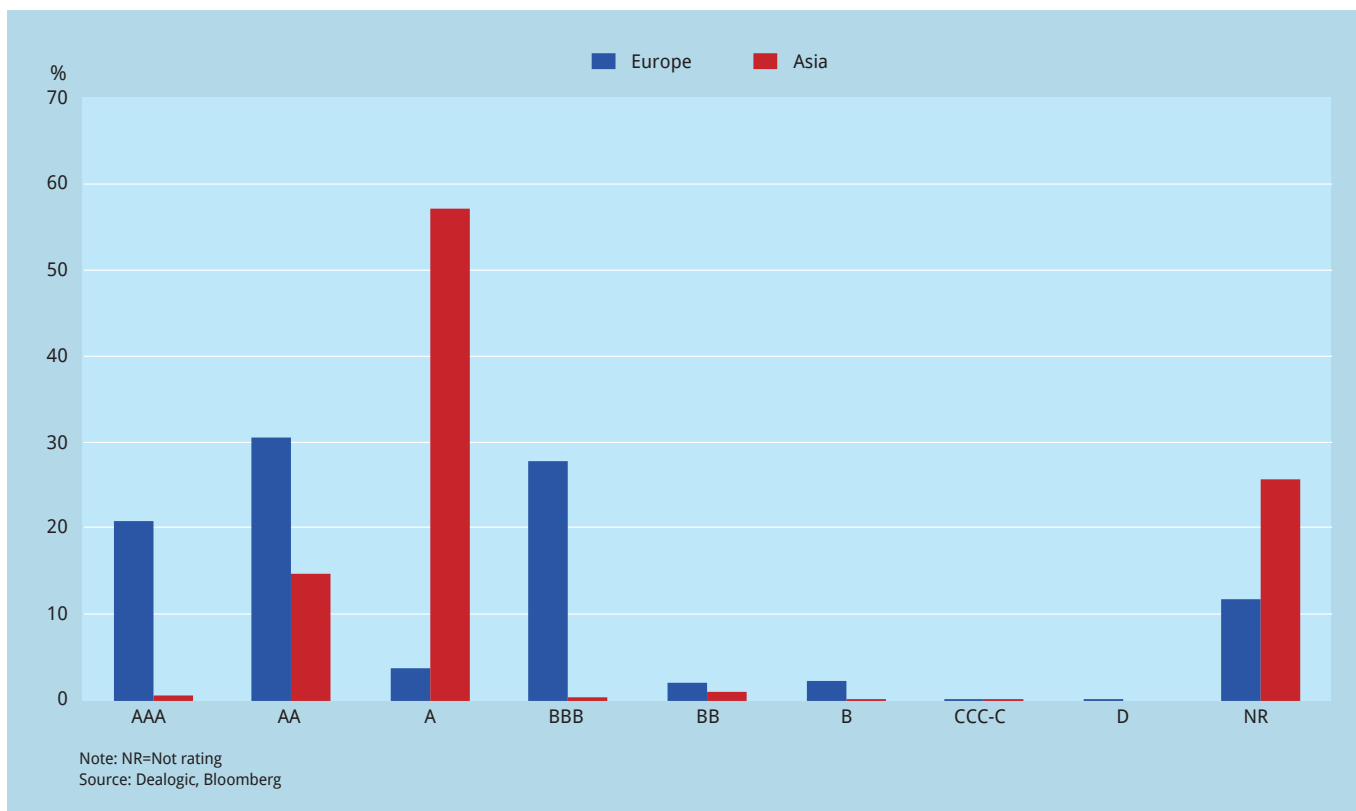


Figure 2: Distribution of Credit Ratings, 2003-2015

er, considering the huge investment needs and financing gap in Asia, this facility will need to be strengthened to successfully facilitate infrastructure bond issuance.

Lessons from Korean Experience: Social Overhead Capital (SOC) Bond

To facilitate private participation in infrastructure in Korea, the Promotion of Private Capital into Social Overhead Investment Act (PPI Act) was passed and enforced for the first time in 1994. The PPI Act and the Enforcement Decree, as the principal components of the legal framework for Public Private Partnership (PPP), define “eligible facility types, implementation schemes and process, conflict resolution/termination mechanism, and the roles of the public and private parties.” The Act was amended in 1999 to introduce a risk sharing and minimum revenue guarantee (MRG) mechanism and again in 2005 to

introduce the Build-Transfer-Lease (BTL) scheme, diversification of facility types, and expansion of investor profile.

The Korean government supported PPI projects with various policy measures. Construction subsidies can be granted to the concessionaire if the subsidy is necessary to maintain the user fees of the services provided at an appropriate level. A certain fraction of projected revenue can be guaranteed through MRG agreement if the actual operating revenue falls short of the projected level. Also, various preferential tax treatments are applied to PPI projects. Furthermore, Korea Infrastructure Credit Guarantee Fund (KICGF), which was established in 1994, provides credit guarantee services, including guarantees for infrastructure bonds.

Among these government supports, the MRG mechanism resulted in a fiscal burden increase because the actual revenue fell far short of the projected revenue. Against this background, since the revision of the PPI system in 2006, the government has become more selective about providing MRGs. While the number of MRGs continues to be reduced, the government expects an increasing demand for infrastructure credit guarantees.

Korean SOC bonds were popular

in their early stage because of the special tax treatment as well as of the difficulty in obtaining syndicated bank loans in the aftermath of the 1997 financial crisis. However, in recent years, a relatively low expected rate of return and high transaction costs involved in SOC bonds made them a less attractive option for infrastructure financing, while investors are competing for higher returns provided by alternative financial products as reflected in the recent performance of private sector infrastructure funds in Korea.

Conclusion

As Eichengreen and Luengnaruemitchai (2006) insist, the small and fragmented economies of Asia face difficulties in developing liquid and efficient bond markets because they require a certain minimum efficient scale. Economic size is one

critical determinant of the infrastructure bond market. The on-going discussion on standardization and harmonization in the ASEAN+3 Bond Market Forum (ABMF) can facilitate the integration of Asian regional bond markets to obtain the minimum efficient scale that would enhance liquidity and depth in the regional integrated bond markets.

As learned from European experience and Korean experience, credit enhancement for infrastructure bonds has contributed to infrastructure bond market development. Considering this positive impact on the development of the infrastructure bond market, ASEAN+3 economies also should take more active policy measures to facilitate infrastructure bonds and furthermore the function and the role of CGIF should be strengthened in order to provide guarantees for infrastructure bonds.

Thus far, the Asian infrastructure bond market is in a nascent stage with the size of issuance still meager compared to the required investment level. However, some meaningful progress has been underway in terms of forming a ripe environment for infrastructure bonds as ASEAN+3 expressed interest in facilitating and developing infrastructure bonds and the regional Credit Guarantee and Investment Facility began to provide guarantees for infrastructure bonds. This implies that now is an opportune time for ASEAN+3 to launch its regional initiative to promote infrastructure bonds from the regional perspective of Asian bond market development.

Notes

- *1 Asia refers to Brunei Darussalam, China, Hong Kong, Indonesia, Japan, Korea, Laos, Malaysia, Philippines, Singapore, and Thailand while Europe refers to Austria, Belgium, Switzerland, Cyprus, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Sweden. In line with Ehlers, Packer, and Remolona (2014), this article focuses on infrastructure bonds that finance economic infrastructure such as roads and electricity (though it excludes the oil, gas, and mining industries), as well as social infrastructure such as schools and health care. The data is merged from Dealogic and Bloomberg and cover infrastructure bonds issued by national and local governments, government agencies, and government development banks regardless of whether these bonds are used solely for financing infrastructure projects.
- *2 European investors might be more prone to take on the higher risks of BBB rated bonds than Asian investors are.

Reference

- Asian Development Bank. (2015) *Local Currency Bonds and Infrastructure Finance in ASEAN +3*, ADB.
- Asian Development Bank Institute. (2017) *Meeting Asia's Infrastructure Needs*, ADB.

Association of Southeast Asian Nations Plus Three (ASEAN+3). (2007) "The Joint Ministerial Statement of the 10th ASEAN+3 Finance Ministers' Meeting." Kyoto, 5 May. http://www.mof.go.jp/english/international_policy/convention/asean_plus_3/20070505.htm

Ehlers, T., Packer, F. and Remolona, E. (2014) "Infrastructure and Corporate Bond Markets in Asia." A chapter in *Financial Flows and Infrastructure Financing*, Reserve Bank of Australia.

Eichengreen, B. and P. Luengnaruemitchai. (2006) "Why Doesn't Asia Have Bigger Bond Markets?" *Working Paper*, BIS.

Hyun, S., Nishizawa, T. and Yoshino, N. (2008) "Exploring the Use of Revenue Bond for Infrastructure Financing in Asia." *JBICI Discussion Paper No.15*.

World Economic Forum. (2014) *Infrastructure Investment Policy Blueprint*. Geneva.

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