

Bhattacharyay, Biswa

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**Financing Asia's Infrastructure:
Modes of Development and
Integration of Asian Financial
Markets**

Biswa Nath Bhattacharyay

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Biswa Nath Bhattacharyay is a Lead Professional and Adviser to the Dean of the Asian Development Bank Institute and on secondment from the Asian Development Bank. This is a revised version of a background paper prepared for ADB/ADBI's Flagship study on Infrastructure and Regional Cooperation and the book "Infrastructure for a Seamless Asia".

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Please contact the author(s) for information about this paper.

Author's email address: bbhattacharyay@adbi.org

Asian Development Bank Institute
Kasumigaseki Building 8F
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

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Abstract¹

Asia faces very large infrastructure funding demands, estimated at around US\$750 billion per year for energy, transport, telecommunications, water, and sanitation during 2010–2020 (ADB/ADBI 2009). Asia has large savings, significant international reserves, and rapid accumulations of funds that could be utilized for meeting these infrastructure investment needs, but Asian markets have failed to use available resources to channel funding into highly needed infrastructure projects. This paper explores issues and challenges in financing infrastructure for seamless Asian infrastructure connectivity and for other high priority development financing needs, and seeks methods and instruments to help direct Asian and international resources to cost-effectively and efficiently support infrastructure and other development needs. The paper discusses three important topics: First, what are the lessons for Asia from the European Union's experience of developing and integrating financial markets and using development banking institutions to support infrastructure investment? Second, how can Asian public and private resources, such as pension funds, social security funds, sovereign wealth funds, and private portfolio funds contribute to infrastructure development across Asia? Third, can Islamic financial markets provide funds for Asian infrastructure development? Finally, the paper makes recommendations regarding financing options and how Asian financial markets and infrastructure companies could be further developed and integrated to mobilize Asian and other regions' savings for financing priority infrastructure projects in the region.

JEL Classification:**G10, G20, G42, G48**

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1. INTRODUCTION

The costs of building and upgrading the Asia-Pacific region's infrastructure to meet the basic needs of its citizens and industries and raise standards and quantity levels to those comparable to advanced countries are huge. During 2010–2020, it is estimated that Asia will need to invest approximately US\$8 trillion in overall national infrastructure for energy, transport, telecommunications, water, and sanitation. In addition, the region will need to spend approximately US\$300 billion on regional pipeline infrastructure projects² in transport, energy, and telecommunications. This amounts to an overall infrastructure investment need of about US\$750 billion per year during this 11-year period (for details see ADB/ADBI 2009 and Bhattacharyay 2010). Financially, the demand for cross-border and regional infrastructure funding will often directly compete with funding for improved national infrastructure³, which will be primarily financed by the home country (national and local) authorities. These financial requirements are huge and the result is a very large financing gap, or the difference between total financial requirements and the likely available financing through direct public resources. However, it simultaneously offers considerable benefits and vast investment opportunities for the large savings and international reserves in Asia and the Pacific (hereafter referred to simply as Asia).

Asia has an abundance of resources that can be utilized to meet these financing needs. Table 1 shows how the total annual savings of the eleven Asian economies were a massive US\$4 trillion in 2007 and US\$3.6 trillion in 2006. Moreover, the stock of total official international reserves reached US\$3.7 trillion in 2007 (US\$3.1 trillion in 2006). This huge pool of Asian savings is sufficient to finance Asia's infrastructure development if means can be found to direct it to that purpose.

² Regional infrastructure projects are defined as: (i) projects that involve physical construction works and/or coordinated policies and procedures spanning two or more countries; and (ii) national infrastructure projects that have a significant cross-border impact including: (1) their planning and implementation involve cooperation or coordination with one or more other countries, (2) they aim to stimulate significant amounts of regional trade and income; and (3) they are designed to connect to the network of a neighboring or third country (ADB/ADBI 2009).

³ For example, according to the Indian Planning Commission's Eleventh Five-Year Plan, India requires US\$500 billion to US\$515 billion during the years up to fiscal year 2011/12 to upgrade its infrastructure and maintain robust growth (Planning Commission 2008).

Table 1: Gross Domestic Products, Gross Domestic Savings, and Foreign Reserves of Selected Countries in Asia, 2006-2007 (in US\$ billion)

Country/region	2006			2007		
	GDP	Saving	Reserves	GDP	Saving	Reserves
PRC	2,774	1,313	1,066	3,239	1,384	1,434
Hong Kong, China	190	63	133	201	84	141
Japan	4,366	1,247	875	4,403	1311	923
Korea	888	282	238	958	311	257
Taipei, China	356	88	266	372	116	280
<i>East Asia-5</i>	<i>8,574</i>	<i>2,992</i>	<i>2,579</i>	<i>9,173</i>	<i>3,207</i>	<i>3,034</i>
Indonesia	365	105	41	388	140	51
Malaysia	156	63	82	175	85	98
Philippines	118	22	20	140	47	30
Singapore	132	67	136	150	88	152
Thailand	206	72	65	237	97	79
<i>ASEAN-5</i>	<i>977</i>	<i>328</i>	<i>343</i>	<i>1091</i>	<i>457</i>	<i>409</i>
India	911	308	170	1085	329	267
<i>Asia-11</i>	<i>10,461</i>	<i>3,628</i>	<i>3,093</i>	<i>11,349</i>	<i>3,992</i>	<i>3,710</i>
<i>Excluding Japan</i>	<i>6,095</i>	<i>2,381</i>	<i>2,218</i>	<i>6,946</i>	<i>3,992</i>	<i>3,710</i>

Notes:

Official reserves at 2007 represent values as of the end of the third quarter.

Data on GDP, savings, and reserves for each economic region are the sum over the countries in the region.

2005–2006 data on gross domestic saving of Japan are imputed based on trend term, GDP, and second-order lag terms of saving itself.

Sources: Asian Development Bank (ADB) - Key Indicators 2007; Asian Development Outlook (2008), ADB, Manila; International Financial Statistics (IFS) (2008), International Monetary Fund, Washington, D.C.; World Development Indicators CD-ROM (2007), World Bank, Washington, D.C.

There can be no single path to mobilizing sufficient funding for infrastructure in Asia. The funding requirements are too large, widespread, and diverse and will require multiple sources of funding. Different forms of financing will be appropriate for different types of projects belonging to various sectors and social, legal, or institutional settings. Multilateral development banks, such as the Asian Development Bank (ADB) and the World Bank, and bilateral development banks (BDBs) or agencies, like the Japan International Cooperation Agency (JICA) and the Japan Bank for International Cooperation (JBIC), can provide funds and facilitate co-financing. However, their ability is quite limited compared with the vast needs. Public, private, and mixed funding—such as public-private partnerships (PPP)—will all be needed within and beyond Asia.

Why have Asian economies not been able to fill the financing gaps? Incentives must be found to increase the total funding of infrastructure. It is equally important to direct funds to where they could be most beneficial, including finding methods for dispersing funds to smaller or low income countries that might normally be missed.

This paper will review various options for financing national and regional infrastructure development in Asia to create a pan-Asian infrastructure network that supports basic human needs, enhances regional connectivity, promotes intraregional trade and economic development, and provides public safety and welfare. Particularly, it will discuss the role of financial integration in financing infrastructure with the examination of experiences in Asia and other regions, such as the European Union (EU) and Latin America. This paper also focuses on steps that could be taken to raise the needed funds based on the lessons learned and prior experiences.

The remainder of this paper is organized as follows: Section 2 examines the role of financial market integration in mobilizing infrastructure funds. It also sets out general steps that can support the building of strong and effective integrated financial markets in Asia. Section 3 reviews the experiences in Asia and other parts of the world, particularly the European Union (EU). Section 4 recommends ways, means, and specific changes to institutions and programs to address the infrastructure financing gap. This includes the role of major financing institutions such as ADB, World Bank, and the Asian Bond Market Initiative (ABMI). The last section concludes with final thoughts and recommendations.

2. ROLE OF FINANCIAL INTEGRATION IN ASIA

In this paper, it is hypothesized that inefficient and segmented financial markets in Asia prevent effective intermediation between Asia's large savings and Asian investment needs. In the absence of effective financial markets with significant penetration throughout the region, Asian financial markets are mostly outwardly oriented. Massive savings from net export surpluses flow out of Asia through a few Asian financial centers to global financial centers, such as New York and London. This process is inefficient in addressing Asia's investment needs and creates a range of serious problems from capital flow management, negative carrying costs, and poor investment signals, to difficulties in monetary policy and shallow and volatile markets, among others. It also unnecessarily embeds monetary and exchange policy decisions made in Washington, London, or Frankfurt into the savings-investment process in Asia. Efforts to build stronger and more relevant integrated financial markets in Asia can thus address such serious issues, and also facilitate the real economic adjustments needed to support Asia's development.

2.1 Impediments to Intra-Asian Regional Investments

Why are Asian financial markets and private sector companies failing to adequately contribute to regional investments? Some of the answers can be found in several areas where there are impediments to effective cross-border flows of investment capital in Asia. One major impediment is that, despite reforms, there is still a deficiency in appropriate legal, regulatory, and governance frameworks that encourage cross-border investment and mitigate political, legal and regulatory risks. Many potential investors may fear that cross-border investments are too risky, with uncertain prospects to recover funds or resolve commercial disputes in the absence of any dispute settlement mechanisms. Concerns about political uncertainties or discrimination against foreign investors might also impede capital flows. Development of commercial and legal codes and conflict resolution frameworks, such as those envisioned in the Economic Research Institute for ASEAN (ERIA) East Asian Community blueprint, can contribute greatly to mitigating these concerns and creating an enabling environment.⁴ Progress dealing with legal and governance impediments to cross-border investment is needed.⁵ Linking Asian capital markets such as stock and bond markets can facilitate cross-border investment.

Inhibiting the development of viable infrastructure projects are difficulties in design, cost estimation, and technical preparation of bankable cross-border, or regional⁶, infrastructure projects. Difficulties also arise in gaining full understanding of all potential risks involved

⁴ On 4 March 2008, a joint Institute for Development Economics/Japan External Trade Organization conference "Creating the World's Largest Business Space" unveiled plans for a unified economic space in Asia including all major South and East Asia countries. To support this initiative, the Economic Research Institute for ASEAN and East Asia (ERIA), located in ASEAN headquarters in Jakarta is preparing a blueprint for integration of trade and infrastructure and supporting institutions and policies. Harmonization of commercial codes and adjudication of business disputes are key parts of the agenda.

⁵ For in-depth discussions of these issues, please refer to works by Albuero (2010) and Wang (2010).

⁶ The terms "cross-border" and "regional" are used interchangeably in this paper.

(such as political, socio-economic, operational, and financial), and the pricing those risks. Cross-border projects are more complex in many dimensions and are often of larger scale compared to national projects. A long, expensive, and technically demanding process is required to prepare infrastructure projects that will appeal to international investors and offer profits. Feasibility studies for large cross-border projects require considerable financial outlays and determining the criteria for sharing these expenses among participating countries is challenging. Cross-border infrastructure projects are typically non-rival and/or non-excludable and can be fronted by entrepreneurs, or governments, with possible assistance from International Financial Institutions (IFIs) and Multilateral Development Bank (MDBs) such as ADB or the World Bank. Difficulties in locating funding for technical preparations, lack of expertise, lack of project implementation capacity, and the absence of a prioritized program for development are among the major impediments to effective cross-boarder project implementation.

Traditional infrastructure financing—government financing through debt or bonds—has severe limitations. Most Asian debt is financed through bank loans, but these loans are limited in tenor and expose projects to refinancing risks. The past reliance on government funding of infrastructure has stunted the growth of private bond markets and financing, and only now that demand for private participation exists,⁷ are the tools to support private funding being built. Funding can be facilitated by building effective capital markets, but often must also be supplemented by public investment initiatives and guarantees to promote the desired types of infrastructure investment. This requires efficient and stable financial markets that provide investment signals promoting the most productive use of capital for infrastructure.

Many of the reasons for the financial sector in Asia having failed to provide the needed support for infrastructure finance were discussed in depth in the 2008 OECD-ADBI Roundtable on Capital Market Reform in Asia and some key conclusions taken from that discussion are summarized in Box 1. Overcoming financial sector impediments to encourage efficient flows of private capital, in conjunction with supportive official investment, guarantees, and concessional finance, is a necessary component for addressing regional infrastructure investment needs and the financing gap.

⁷ For instance, India's 11th Five Year Plan (2007–2012) has total investment requirements of US\$494 billion, with private contributions for infrastructure development at nearly 30%. India has adopted an open model that encourages foreign investment. India permits 100% foreign direct investments in most sectors and this has resulted in large private flows primarily through private equity placements. However, bond market financing remains very limited, and promoting bond market development is on the public agenda (Radhakrishnan 2008).

Box 1: The State of Asian Financial Markets - Conclusions from the 2008 OECD-ADBI Roundtable on Capital Market Reform in Asia

Asian financial markets are dominated by banks, many of which are integrated with international interbank markets, allowing the banks to serve as intermediaries between Asian sources of capital (generated by high local savings and high export earnings) and global interbank markets, which absorb these funds. Capital from international markets comes back to Asia through banks, but also through equity markets and foreign direct investment. This out-and-in pattern has very successfully supported export expansion and private sector construction in many Asian countries. Moreover, until quite recently, it contributed to very large accumulations of official reserve assets, as authorities accumulated reserves and successfully kept prices under control through sterilization. Also, the condition of banking systems steadily improved and banks have built strong capital bases, improved efficiency and profitability, and reduced nonperforming loans.

This system, however, tended to slow the development of deep capital markets that permit local lenders and borrowers to lend and borrow across the range of maturities at rates reflecting local supply and demand conditions. Banks often failed to serve large communities within their countries, which left potential market niches for innovative institutions or capital-market instruments. Also contributing to the weak impetus to develop capital markets were restrictions on cross border investments, lack of institutional underpinnings, lack of legal harmonization between countries, exchange rate risks, and lack of market depth and volume, which resulted in more volatility and higher costs. The investor base remained small, with institutional investors largely missing. Market and prudential information and disclosures were weak. Markets remained largely isolated from each other.

The pattern above is gradually changing, with a deepening of markets and incremental growth of equity and bond markets. In particular, there has been significant progress in developing local currency bond markets. Also, securitization is being introduced as a way of channeling investments into new areas. The improvements are in part due to progress in revamping regulations, oversight, and institutions that have improved market conditions. Capital markets are deeper, more inclusive, and more open; Legal arrangements are improving; corporate governance is better; the regulatory and supervisory frameworks are stronger; and countries have adopted international standards and best practices.

Source: Author

High capital intensity of cross-border projects implies a high debt service ratio, long pay-off periods, and uncertainty of the forecast traffic volumes or demand. This requires availability of appropriate and innovative financial instruments in the financial markets. Equity investment is an efficient method for sharing risk between public and private sectors for long tenure, cross-border projects. However, several Asian countries do not allow equity investment by foreign companies in certain infrastructure sectors. The private sector would then have to bear a higher risk in the form of a debt position in order to participate in infrastructure projects in these countries (van der Geest and Nunez-Ferrer 2010).

Improvements are apparent, but the pace lags behind the potential and important current needs remain unserved. Many countries in the region need to do more to enhance the operations and efficiency of their financial markets, but resources for facilitating these efforts are often limited. Moreover, the culture of capital market investment needs to be substantially strengthened. Overcoming financial sector impediments and aspects of financial packages are covered in greater detail later in this paper.

2.2 Regional Financial Integration – A Regional Approach to Financing Infrastructure

The financing of cross-border infrastructure inherently demands a regional perspective, because projects that involve more than one country introduce risks that single country projects do not face and the financing comes from different economies. It is useful to review this situation from the perspective of an integrated Asian economy rather than as the sum of needs of individual Asian countries. The regional approach must take into consideration exchange rates, inflation, and interest rates, as well as benefit and cost valuation issues over time.

Assessing Asia-wide infrastructure costs and benefits on a consistent basis, uninfluenced by varying configurations of exchange rates, national inflation rates, and interest rates, is advantageous, because funding costs and the discounting of project costs and services benefits are affected.⁸ Premiums for exchange rate risk and country risk will affect the cost of borrowing for infrastructure. Differences in inflation performance between countries also affects the cost of infrastructure development, with countries that have a history of high inflation facing elevated borrowing costs as inflation premiums are built into borrowing rates. Considering inter-temporal infrastructure costs is also important, because the structure of the individual economies will change as infrastructure systems are developed and countries become increasingly integrated into the regional economy, and the valuation of infrastructure costs and benefits will change as the infrastructure evolves.

New institutions and markets will be needed to tap savings within the region, to lure private and public foreign capital, and direct them to priority infrastructure projects throughout the region. The most efficient application of capital infrastructure development will involve significant intra-Asia flows of capital because individual country programs may be at odds with the optimal regional arrangement, given differences between countries in domestic savings and infrastructure needs, and likely externalities in benefits of infrastructure development that are not captured on a national basis. The new regional institutions and markets could be structured in two ways: either effectively integrated across the region or converged in practice through collaborative national efforts.

Each factor mentioned above suffers from the absence of efficient bond markets in Asia, which is a tool for tapping long-term capital for use in building infrastructure that usually involves long time frames. Long-term bond rates are affected by inflation and exchange rate premiums, which vary from country to country. Moreover, without convergence to efficient common bond pricing *between* economies, their respective capital markets will remain separate, which hinders borrowing of large capital and the reallocation of capital to the most productive infrastructure projects. Also, without a common bond rate, discounting the value of future benefits and costs is difficult.⁹

⁸ A unified method of valuing projects through the region should be considered. The International Comparison Project (ICP) has shown that national exchange rates can systematically diverge for extended periods from appropriate values based on purchasing power parity. Moreover, the specific configuration of exchange rates can affect assessments in two ways: the costs of individual cross-border projects are affected by the exchange rates between countries, and the exchange rate of Asian currencies vis-à-vis the denominator currency (presumably the external currency used to fund most of the imported capital requirements for infrastructure development) also affects calculations. Moreover, changes in exchange rates over time, perhaps resulting from endogenous economic changes created by the new infrastructure, affect overall valuations.

⁹ The segmentation of a financial market is likely to result in non-convergence in pricing between two markets for similar or identical products. This imperfection in the “law of one price” has been observed even for identical equities selling in two economies, even if such non-convergence is very small. This is relevant for the infrastructure project in two ways; a security to fund infrastructure in a common currency unit or basket might have somewhat different values between countries based on differing liquidity and trading practices, and

Based on these considerations, the question arises whether a basket measure of currency requirements for infrastructure investment should be constructed to provide a cross-country, temporally consistent method of project valuation in different Asian countries.¹⁰ A basket could be constructed according to size of the economies, regional purchasing power parity, or based on the costs of technical inputs for development of Asian infrastructure, among others. This paper, therefore, will examine currency risk exposures of lenders and borrowers in cross-border infrastructure projects under different types of currency basket arrangements.¹¹

Many of the issues presented in this sub-section were also faced when the euro was created. In the European experience, a virtual currency (the European Currency Unit, ECU) was initially used to denominate official cross-border transactions, but it eventually evolved to serve as the basis for a real, single currency (the euro) to which the exchange rates of individual economies were irrevocable linked. Also, in Europe a major program was put in place to fully integrate national financial markets into a single market, which until the onset of the financial crisis was notably successful in erasing differences in national risk premiums.¹² A full monetary union approach as in the case of Europe is an option, but other approaches that would achieve similar benefits must be explored, as a monetary union is not generally considered feasible in the Asian context.

3. INTERNATIONAL EXPERIENCE

This section investigates issues concerning the development of integrated financial markets in Asia and their role in financing regional infrastructure investment in Asia. It includes lessons for Asia from financial market integration initiatives in Europe and Latin America, covering both the creation of a single integrated market and policy investments that promotes infrastructure. It also looks at the potential for using the resources held in Sovereign Wealth Funds (SWFs) and mobilizing funds from Islamic Financial Markets.

3.1 The European Union

The integration of European financial markets to support infrastructure development in Europe provides important lessons for Asia. Here, the pros and cons of different types of integrated regional financial markets supporting infrastructure development are compared with a base line of no integration and reliance on individual country markets to promote infrastructure.

The European Monetary Union (EMU) (also called the Euro area) was created in 1999 based on the Maastricht Treaty signed in 1992. It was the culmination of a long process of economic, political, and social integration that began shortly after World War II. The process of financial sector integration in the EU since 1999 can be divided into four stages:

- **Stage 1:** In 1999, the Euro area monetary union was created with the euro as the single common currency. The euro was used as a virtual currency or accounting unit in all member countries. The exchange rate of each national currency was

returns on Islamic bonds (sukuks) and conventional bonds for the same project are unlikely to ever fully converge.

¹⁰ The use of a basket of currencies to create a standard measure of value is in some way like creating a virtual currency that can be used to denominate transactions and assets. A virtual currency might ultimately evolve into a real currency, perhaps in the manner in which the European Currency Unit (ECU) morphed into the euro, but evolution into a true currency is not inevitable, especially if political interest in creating a currency is missing.

¹¹ Dealing with intertemporal consistency for a basket is a major challenge.

¹² It is relevant to distinguish between technical financial issues and politico-economic issues in constructing an efficient capital market for cross-country infrastructure finance. The financial rationale for integration may be at odds with the political environment.

irrevocably fixed against the euro, a single monetary policy was introduced and run by the European Central Bank (ECB), a common exchange rate and international reserves policy was created, and a euro-based clearing system was set up, among many other actions. The key goals at this stage were implementation of a common monetary and exchange policy.

- Stage 2: In 2002, the existing national currencies were retired and the euro entered circulation as a physical currency in all member countries. The changeover was quick and smooth. This fostered integration of currency markets, with free use of the currency throughout the union and elimination of national borders for currency.
- Stage 3: The successful launch of the euro permitted the ECB to refocus attention to actively promote creation of a single financial market in which there would effectively be no national borders for financial markets in Europe. An example is the Single European Payments Area (SEPA) that seeks to make retail and business cross-border transactions in Europe as easy and cheap as domestic transactions.
- Stage 4: Geographic expansion of the union began with Greece joining the Euro area in 2001. In 2004, the EU expanded eastward and into the Mediterranean to bring aboard 10 new members. Bulgaria and Romania joined the EU in 2007. Slovenia, Malta, and Cyprus have also already joined the Euro area and Slovakia joined in 2009. All the new EU countries are legally committed to join the monetary union once they meet a set of rigorous entry requirements.

3.1.1 Financial Market Integration

The steps toward greater financial sector integration in Europe are multifaceted and complex. Many institutional and policy changes were introduced and harmonized between all member countries and with union-level institutions.

The European Currency Unit (ECU) began in 1975 as the European Unit of Account (EUA) to serve the purpose of having a standardized accounting value for projects involving multiple European countries, such as the European Development Fund. Following the breakup of the Bretton Woods agreement in 1971, European countries lacked fixed exchange rates to denominate transactions between countries or for community-wide purposes. A common measure was needed to set the budget for the European Economic Community, for settlements between countries, and for administering the Common Agricultural Policy and pricing agricultural commodities. Moreover, the measure of value also needed to serve as a measure of future values in order to measure investments and their costs and returns over time (EC 1984).

In the early days of the EMU, implementation of the single monetary policy required integration of money markets and markets in short-term capital and creation of a common system of clearing in the new currency, all backed up by institutions applying and enforcing common standards in all member countries. This was mandatory to ensure monetary control and permit transmission of monetary policy impulses throughout the Euro area. After that initial stage, new actions and institutions began to be put into place in order to complete the integration of European long-term capital markets and retail financial markets (Trichet 2006). Box 2 details the levels and types of European programs and institutions supporting financial integration.

Box 2: Financial Integration Programs and Institutions in Europe

To support the goal of financial market integration, the ECB and other European institutions are involved in a wide range of regional financial programs. The programs fall into three areas: (i) programs that directly support monetary policy by permitting short-term monetary policy impulses to course throughout the union; (ii) programs to enhance and integrate equity and bond markets; and (iii) programs to integrate business and retail financial markets. Each is considered as necessary to ensure the overall efficiency of the market and the effectiveness of the market in providing proper signals that will help channel investment into priority markets throughout the continent. This section lists some of the range of tasks and several key programs undertaken in Europe to integrate its markets to see what lessons Asia can draw to achieve similar results.

Monetary Policy Implementation – <i>Transmission of Monetary Policy Impulses</i>	Long-term Capital	Retail – <i>Single Euro Payments Area (SEPA)</i>
<ul style="list-style-type: none"> • TARGET (Trans-European Automated Real-Time Gross Settlement Express Transfer)¹ • Euro1 (Bank-sponsored euro system)² • Monetary policy deposit and funding facilities and interest rate corridor • Collateral for monetary operations • Repo facilities • Service provision – cash settlement and real time gross settlement systems • Settlement for securities’ payments, including delivery versus payment (DvP) • Central depositories for government bonds • Supervisory oversight • Continuous linked settlement (CLS) system for foreign exchange transactions • Standards for fees (to make cross-border fees the same as national fees) • European Banking Association (EBA) • Committee of European Bank Supervisors (CEBS) • Systemically important payments systems (SIPS) • Enforcement (decentralized) • Role of central bank money 	<ul style="list-style-type: none"> • TARGET2-Securities • Servicing of long-term instruments <ul style="list-style-type: none"> ○ Large value payments ○ Bond Depository ○ Repos ○ Credit transfers • Securities Settlement Systems (SSS) • Standardization of instruments • Legal framework and oversight (cooperation with IOSCO) • Stock exchanges oversight • Securitization • SPV legislation • Oversight of fiscal situations (national risk premia have sharply narrowed) • Inflation targeting (inflation premium has narrowed) 	<ul style="list-style-type: none"> • Single European Payment Area (SEPA) credit transfer • SEPA direct debit • SEPA credit and debit card framework. • PEACH (Pan-European Automated Clearing House)³

¹ A clearing system for large euro transactions throughout euro area to support transmission of money market instruments throughout the banking system. A new system, TARGET2 with a centralized processing platform, was introduced in 2008.

² A multilateral netting system sponsored by the European Banking Association with 71 clearing banks. End-of-day settlement is through TARGET. The system includes a liquidity pool at the ECB and a loss sharing agreement.

³ STEP2 is an EBA sponsored PEACH owned by EBA Clearing Corp. Payments are made in batches. Gross settlement in Euro I, with unsettled payments returned. Settlement in future will use TARGET2.

Source: Authors’ compilation

>

Box 3: Loan Guarantee Instrument for Trans-European Transport Network Projects (LGTT)

This box provides an example of an innovative program to support the financing of European infrastructure. The LGTT guarantee program of the European Investment Bank (EIB) and European Commission facilitates greater participation of the private sector in the Trans-European Transport Network Infrastructure (TEN-T). Networks cover transportation, energy, and communications. The LGTT deals with the specific issue of guaranteeing servicing in the initial phases of a project's operations.

Under the LGTT, the EIB incurs greater risk than in its normal lending. It backs stand-by facilities (SBF) sold by lenders to borrowers that can cover servicing needs during the first years of a project. The EIB and European Community (EC) each contribute equally in order to back up guarantees sold by banks providing infrastructure funding. The banks receive fee income for selling the guarantee, but because the guarantee substantially enhances the quality of the credit, the bank should be able to offer significantly cheaper financing to the borrower for the project. The reduction in risk and lower borrowing costs both will support increased infrastructure finance.

Once a project is online, the borrower can draw on the SBF during the first five years if needed to ensure payment of the senior line of credit. Payments of principal, interest, and interest accruals are covered. The SBF is funded by the creditor bank. If the creditor bank calls on the LGTT, the EIB makes payments and becomes a subordinated creditor on the project. The EIB claims are subordinate to senior credits, but superior to equity. Several options are provided to service the EIB claim after the senior credit obligations are fulfilled.

Source: European Investment Bank (2008)

This integration is a sign of the EMU's success. Furthermore, Ehrmann et al. (2007)¹³ found that the creation of the union fostered significant integration of financial markets, creating significant improvements in the functioning of financial markets with the convergence in the levels and co-movements of long-term sovereign bonds, in bond yield responses to common shocks, and in long-term inflation expectations built into bond yields toward the rates of the countries with lowest inflation expectations. The integration of financial markets in the Euro area has brought down and stabilized bond yields by eliminating exchange rate risk and creating confidence that the common monetary policy will achieve low inflation throughout the union. Further contributing to the convergence are three additional elements integral to the European economic environment: general macroeconomic convergence and stability, government fiscal restraint, and financial sector stability.

To support macroeconomic convergence and stability, European authorities moved toward more intensive policy coordination and the strengthening of national institutions through strong regulatory oversight. These actions, although indirect, create a system of strong national institutions within the regional framework that facilitated cross-border investment and market integration.¹⁴

¹³ See also Baele et al. (2004) and Hartmann et al. (2007)

¹⁴ As examples, the Euro area places strong limitations on the ratios of national fiscal deficits and national debt to GDP. The Maastricht Treaty specifies that deficits and government debt cannot exceed 3% and 60% of GDP, respectively. The Growth and Stability Pact provides sanctions for countries that violate these limits. Also, the importance of a strong and stable financial system to support monetary policy operations and to contribute to strong economic growth was recognized. These factors, even though decentralized, contributed to clear

3.1.2. European Development Banking

Although strong financial markets in Europe enable capital markets to finance much of the infrastructure requirements, Europe has a number of programs to provide more direct funding of priority infrastructure, with emphasis on supporting funding in poorer regions or areas with special needs. Box 3 illustrates one innovative program to guarantee loans to support transportation infrastructure development. The European efforts show that even in a region with ample capital market funding, special efforts are needed to directly provide lending for infrastructure or to provide a range of enhancements to investors to prompt their investment. Another broad conclusion is that great flexibility and use of sophisticated financial engineering techniques are required to construct financial incentive packages that make infrastructure projects attractive to potential investors. Extending the European model to Asia suggests that both an efficient regional integrated market and continuing official assistance are needed to support infrastructure development.

If similar approaches were attempted in Asia, new, well-capitalized institutional arrangements may be needed to emulate the results achieved in Europe, and continuing sources of concessional funding will be needed to cover the costs of incentives and guarantees. Also, Asian development institutions can—as is done in Europe—serve as a source of technical expertise and assistance in building local bond markets. The importance of development banking and concessional incentives is likely to be especially important over the next several years because of the current crisis in financial markets, which has made many investors hesitant to make commitments.

3.1.3. Relevance of the European Financial Integration Program for Asia

The EMU places strong emphasis on development and integration of the financial markets, which may hold lessons for how markets should develop in Asia to support infrastructure finance and support financial market efficiency in general. What lessons can be drawn for Asia from the EMU experience?

Foremost is the aggressive nature of the programs to integrate financial markets in Europe. The efforts are explicitly tied to promoting innovation and competitiveness for the financial sector and to support the general economy. Improvements in the financial sector are seen as directly contributing to the productivity and competitiveness of Europe in the world economy. Asian financial systems are starting from a less competitive position and will need to make continuing improvements to not fall further behind.

The European system also directly addresses the diverse risks that can inhibit cross-border investment through the introduction of the euro, which eliminates currency risks in cross-border transactions. In Asia, by contrast, infrastructure projects denominated in national currencies have currency risks affecting (1) investors via loss on investments denominated in a foreign currency; (2) servicing costs of projects that increase if the national currency depreciates, and (3) cross-border projects where a relative exchange rate change for one country could jeopardize the project. The long-term nature of infrastructure investment increases the probability of experiencing such exchange rate risks. Europe, through its wide range of oversight, market-building efforts, and policy lending and guarantees, is also effectively addressing other key risks including country risk, default risk, interest rate risk, and traffic risk (the danger that start-up traffic is insufficient to service debts).

Moreover, within the integrated European system, effective oversight of individual member countries through review of macroeconomic and fiscal policies is used to promote and achieve the benefits of integration and avoid possible collective destabilization. Asia is also slowly working to build and expand its economic oversight and policy dialog systems. The

lessening of national risk in the bond markets, and fostered an environment conducive to cross-border investment.

recent strengthening of the Chiang Mai Initiative (CMI)¹⁵ and the recommendations of ADB Institutes' (ADBI) capital flows management project¹⁶ are clear steps in the right direction that hopefully will be further advanced. Potentially, an Asian financial market oversight system or Asian Financial Markets Stability Forum could contribute to stronger and less volatile financial markets for Asia.

An enforcement arm in the Euro area makes member countries abide by strict rules governing individual country economic and fiscal policies, which are embodied in their convergence indicators, to create conditions conducive to overall macroeconomic and fiscal stability. Such a transnational enforcement tool does not exist in Asia. An alternative would be to develop a set of Asian convergence indicators that would be published, thus using market discipline through disclosure as a tool to promote greater convergence.

Europe applies many common standards and codes by regulation, but they often represent the local application of internationally accepted standards, such as those in the fields of accounting, banking supervision, or payments systems. An alternative for Asia would be to promote and support regional adoption of international standards and codes, or adoption and establishment of a common Asian standard and codes. Asian adoption of international standards is largely done locally, and although Asia is not at a point where a transnational body can create and impose its own standards, more aggressive steps should be taken to coordinate across Asian countries to bring all systems in the region individually and collectively up to high levels of compliance with international standards. An Asian Financial Stability Institution could provide leadership in this regard.¹⁷

Concessionary financing of incentives to promote bond markets would also be needed. This could involve developing private insurance firms or a public infrastructure insurance firm to cover the various types of insurance or guarantees involved. A major challenge would be to generate the necessary capital infusion and annual receipt of contributions to the pool for concessional financing.¹⁸ This pan-Asian entity would need to have some sort of oversight function of the instruments and entities it insures, and therefore would collaborate with securities and insurance supervisors.

Clearing and payments infrastructure development should be a high priority, as it was in Europe. The initiatives on clearing systems of the Association of Southeast Asian Nations (ASEAN) ministers in the 2007 ASEAN Economic Community Blueprint appear to have advanced well and efforts can be made to move them to the implementation stage.

Creating cross-border adjudication mechanisms would also contribute to the success of regional integration. This is difficult in the absence of an overarching legal framework as exists in Europe, but wherever possible common codes and documentation should be developed. This convergence is being pursued aggressively in relation to trade and customs documentation, and a similar emphasis in the financial sphere would be welcome.¹⁹ A legal working group could be created (as was done in Europe) to explore areas of convergence in a legal framework to support financial market development.

¹⁵ CMI was created in May 2000 by ASEAN+3 finance ministers in response to the 1997 Asian Financial Crisis, using the ASEAN+3 framework to expand the ASEAN Swap Arrangement and establish bilateral swap and repurchase agreement facilities among ASEAN+3 countries (Henning 2002).

¹⁶ For details see Kawai and Lamberte (2008).

¹⁷ One of the first tasks of the FSF set up by the G-10 countries was to survey the range of international standards and codes relevant for international financial stability. Twelve codes were identified as priorities for international implementation; a larger number of codes were identified as important, but less pressing.

¹⁸ One option for creation of such a pool is to link contributions to the pool with redirected flows from SWFs toward inward regional investment, or other efforts to manage capital flows associated with the SWFs.

¹⁹ ERIA (Economic Research Institute for ASEAN and East Asia) is a research body that conducts policy analysis and other research related to East Asian economic integration) will conduct research in this area. It was announced on March 4, 2008, in Tokyo that ERIA would work on a blueprint to make East Asia the largest business space in the world through harmonization of practices across countries, logistics improvements, and removal of impediments to cross-border trade in goods and services.

3.1.4. Lessons for Asia

The listing of programs and experiences in the previous subsections indicates the seriousness of the European effort to promote a high degree of integration of national financial markets within the EMU. Many gains in efficiency are envisioned and cuts in costs of maintaining separate financial markets have been estimated by the ECB to be equal to several percent of GDP. Direct actions were taken to strengthen integration and the common overarching legal and institutional framework also contributed importantly.

Such results are desirable goals for Asia as well in its efforts to promote financing for infrastructure development. The European experience shows that creating the best situation for Asia, where it could use its vast savings for regional infrastructure development, would involve eliminating barriers and frictions in cross-border financial flows so that funds move to where they are most productive, reducing currency-risk for cross-border finance through policy dialog and recommendations that effectively reduce exchange rate volatility between the Asian currencies, creating stable inflation expectations to eliminate inflation premiums in national bond issues, and reducing national risk premiums embedded in national bond prices. This would involve both reduction in sovereign risk due to poor government fiscal management and a reduction in general country bond premiums by building expectations of general macroeconomic and financial sector stability.

Providing access for all national investment projects to deep and liquid markets so that there is price discovery, competitive pricing, limited volatility, a range of tenors, and comparable financing costs for infrastructure development in each country would also be needed. Achieving this would imply that investors and borrowers throughout Asia would have unrestricted access to regional financial centers, with a collateral system and surety of cross-border settlement, as such liquidity can be generated only in larger, concentrated market centers or through internet trading.

Another necessary component would be the building of comparable market indices. The yield curves of separate Asian financial markets should begin to converge over time and a broad range of maturities should be available in order to most effectively encourage cross-border and regional investment.

The aforementioned tasks add up to a heavy agenda, but it is one that Asia should seriously consider, because in addition to supporting infrastructure investment, such initiatives would increase policy effectiveness, create more effective markets that support growth, save costs, and, importantly, create a financial system that could be more competitive in relation to financial markets in Europe and America. Promoting financial market integration and bond market development has gained increasing traction because of the need to rebalance Asian economies and increase the use of regional savings to support Asian investment priorities. Also, there is a need to build effective and resilient financial markets that open up a wider range of funding options and provide greater overall financial stability.

4. ADDRESSING ASIA'S INFRASTRUCTURE FINANCING GAP

4.1. Countering the Financial and Economic Turmoil

In addition to the major challenges of financing infrastructure for future growth and improving the lives of over two billion people, Asian and Pacific countries are facing headwinds from the ongoing global financial and economic turmoil. The turmoil makes raising needed funds more difficult, private sector investment is threatened in the short term and public finance is more difficult. But it also increases the importance of infrastructure investment. If private flows of credit for infrastructure decline, governments and MDBs can look to infrastructure investments for stable, long-term, and countercyclical investments. Also, the need for

infrastructure services as part of the social safety net in hard times might make it an even more important priority. Thus, the crisis may change the nature of the challenges in building infrastructure networks, but the needs for infrastructure are as, if not more, important than ever. For example, the stimulus package announced by PRC in 2009 totaling US\$586 billion had important infrastructure components—rural infrastructure, roads, energy, railroads, and airports. A package announced in 2008 planned to spend US\$292 billion for railway development alone. Moreover, components of the package dealing with social welfare, such as education and health care, are likely to include an infrastructure component in the form of construction of new facilities (IFCE 2009; FAITC 2009).

The global turmoil and economic slowdown will hurt the finances of Asian and Pacific countries. If exports drop and economic activity slows, total savings in the region will fall, government tax revenues will decline, and additional expenditure for social security is likely. Funding for infrastructure will face stiffer competition from such other needs. At the same time, global investors see their investable funds decrease, leading to drops in capital inflows for portfolio investments and direct investment, and possibly shifts in capital outflows.

However, the special properties of infrastructure as long-term, steady investments that can offer investors lucrative returns make it suitable for countercyclical investment. Governments and multilateral lenders should accelerate infrastructure investment (compatible with overall economic fundamentals) as a countercyclical tool and support long-term economic activity. The returns on such investment will support future economic growth when conditions begin to improve. Moreover, there is potential to continue drawing in private investment from institutions, such as pension funds, that need outlets for long-term investments and, with the proper incentives and prospects for good, long-term returns, infrastructure investment may be seen as a favored investment in turbulent times. Additionally, the global crisis has significantly affected Asia's exports to advanced economies. Investing Asian savings for Asian regional connectivity can assist in rebalancing Asia's growth from high export dependency on advanced economies to enhanced regional demand and consumption through increased intraregional trade and cross-border investment.

4.2. Utilizing Asian Savings for Asian Infrastructure

While a large financing gap for infrastructure development and maintenance does exist, Asian economies have huge savings and surpluses. At present, Asian savings are heavily invested in developed countries in safe, but low yielding, securities, such as US treasury bills. At the same time, due to underdeveloped local capital markets much Asian savings are invested in non-productive sectors, such as real estate or stock market speculation. This has created a global imbalance through financing advanced economies' consumption with cheap money supplied from huge Asian savings.

To attract these savings into investments in productive sectors, there is a need to develop indigenous financial markets, particularly a strong bond market, as well as appropriate and innovative financial instruments. Furthermore, innovative instruments and incentives will be needed to create bankable projects and attract private sector participation. The following section makes recommendations about how Asian savings might be refocused to serve Asian infrastructure needs. These recommendations will draw on the earlier discussions on market integration initiatives in Europe, the potential to use Sovereign Wealth Fund (SWF) resources for infrastructure investment, and the possible role of Islamic finance in infrastructure investment.

Not addressed in this paper is a critical issue of the sequencing of changes to bolster financial market integration. The question is whether financial market integration in Asia is best achieved in stages. The stronger and financially more sophisticated economies could achieve integration first, with other economies following. A complex mix of technical and political factors will affect this decision. However, there is serious concern that those left out are increasingly uncompetitive and once left out are soon forgotten. This study has taken the

view that whatever system of infrastructure financing is developed, it must address the needs of the poorer regions. There are several options that could help fill the significant gap between infrastructure demand and current levels of infrastructure financing, both institutional and instrumental. Table 2 presents various options for infrastructure financing in Asia.

Table 2: Summary of Options for Infrastructure Financing

Reserve Bank of Asia	<ul style="list-style-type: none"> • Combines functions of a reserve bank and an infrastructure financing bank • Authorized capital of about US\$300 billion (10% paid-in capital) • Authority to borrow 10% from Asian central bank reserves to invest globally
Multilateral and Bilateral Development Banks	<ul style="list-style-type: none"> • MDBs and BDBs have an important role to play in reducing gaps in funding when private sector funds do not meet financing needs • ADB has been a reliable funder of a large and broad variety of development projects in Asia, including cross-border infrastructure • MDBs can both create bankable projects and mobilize long-term funding through capital markets, explicit guarantees, and special co-financing arrangements
Local Currency Bond Markets (ABMI)	<ul style="list-style-type: none"> • Local-currency bond issues minimize currency and maturity mismatches • Promote use of Asian savings and foreign exchange reserves in infrastructure • MDBs can contribute by issuing local currency bonds and undertaking currency swaps • Returns should be attractive, and rated by rating agencies
Asian Infrastructure Financing Bank (AIFB) or Asian Infrastructure Financing Fund (AIFF)	<ul style="list-style-type: none"> • Either a new specialized investment bank (IFB) or a new Asian Infrastructure Fund (AIF) administered by MDBs, particularly ADB • Intermediate the use of financial assets for infrastructure and other development projects • Provide infrastructure loans and collaborate with the banking community, co-financing and guaranteeing private investment financing • Direct Asian savings to infrastructure development and develop expertise in cross-border infrastructure bond finance • Negotiation, planning, and implementation of a large new institution will be lengthy and less cost-effective
Regional Companies for Financing Specific Sectors	<ul style="list-style-type: none"> • Finance and manage regional projects for specific sectors • Can also raise funds from capital markets through equity or infrastructure bonds • May take the form of the European Aeronautic Defense and Space Company (EADS) • Sale of public shares throughout the region would help deepen equity markets and provide a needed outlet for savings
Sub-regional Infrastructure Funds or Companies	<ul style="list-style-type: none"> • Initiatives on infrastructure development in Asia, such as the GMS, ASEAN, SAARC, CAREC, and SASEC • Sub-regional companies can also be established to manage these infrastructure projects
Guaranteed and Linked Bonds	<ul style="list-style-type: none"> • Exchange rate and inflation guarantees are key risks that guarantees can cover • Credit risk and servicing risk from low initial infrastructure traffic can also be covered • GDP-linked bonds lower debt service payments in times of economic distress, helping governments avoid default from revenue-related fiscal shortfalls, and can offer investors premium returns if GDP growth is strong
Islamic Financial Instruments	<ul style="list-style-type: none"> • Configure financial packages to meet requirements of Islamic investors • Develop individual and community-level instruments that provide basic banking services to the large Asian Islamic communities • Create an official regional Islamic Financing Bank to provide overhead services to local banking operations
Public-Private Partnerships	<ul style="list-style-type: none"> • Physical infrastructure requires large investments suited to private sector cooperation • Potential for private financing of up to perhaps 30% of total investment needs
Asian Infrastructure Currency Unit (AICU) denominated bonds	<ul style="list-style-type: none"> • Focus of AICU is to reduce exchange rate risk • AICU is an accounting mechanism equal to a weighted measure of Asian currencies, and based on <i>de facto</i> relative stability between Asian currencies • Weights may depend on factors such as GDP, international reserves, or the basket of currencies used in a specific infrastructure project

4.3. Financing Institutions for Regional Infrastructure Investment in Asia

4.3.1 Pan-Asian and Subregional Infrastructure Funds

It is proposed that a series of special funds be set up that will support financing projects at both national and regional levels by identifying, prioritizing, designing, and then promoting the development of infrastructure projects. There is a need for a pan-Asian and/or a series of subregional infrastructure funds dedicated to cross-border projects to enhance Asia's connectivity and move toward the creation of a seamless Asia. These can be best thought of as multi-donor platforms that provide good means to collect and administer funds received and then have flexibility to move them according to suitable priorities and sequencing.

Such funds could be administered in a variety of ways and it is not necessary to set up new institutions, though that is always a possibility. For example, ADB could be the administrator of all or some of the funds as trust funds, a participant with other partners, or an investor in a new entity. Whatever the structure (which is a policy issue) it is important that the funds perform certain important functions in support of infrastructure development and financing.

The first need is identifying, prioritizing, designing, and promoting the development of infrastructure projects. The quality of this process is critical because the goal is to produce a list of well-designed, bankable projects that accurately describe the benefit, costs, and risks of projects in ways that make clear how they are good bets for large public and private investments. These funds can be supported by creating a special joint grant facility by ADB and other MDBs and bilateral contributors, such as the Japan Bank for International Cooperation (JBIC) and the Japan International Cooperation Agency (JICA), to help identify and prepare bankable cross-border projects. These funds need to provide grants and concessional financing to Asian countries that have low-incomes and low technical capacities to reduce asymmetric costs and distribute benefits among participating countries.

These funds might include private sector participation, which could be necessary to obtain adequate funding. Such private sector participation may also be designed to provide access to technical or industry expertise of the private sector, such as creating consortiums of firms in rail development or port logistics. The interface with the private sector would help in identifying and designing bankable cross-border projects and in negotiating with governments and potential private investors sectors. Finally, the fund would need to consider how to provide necessary incentives to countries (particularly low income ones) to agree to and implement cross-border projects. One option is to provide concessional funds to low-income developing countries who may not receive proportionate benefits compared to middle-income countries participating in a regional project.

4.3.2. Reserve Bank of Asia

Agarwala (2008) proposed the establishment of a Reserve Bank of Asia (RBA) to address the infrastructure financing gap of Asia, both at national and regional levels, and also to serve as a type of regional central bank. The RBA would have an authorized capital of about US\$300 billion, 10% of which could be in the form of paid up capital. The bank would have authority to borrow from the central banks of Asia about 10% of their foreign exchange reserves at the rate of return on 30-year US Treasury Bills and to invest them in global equity indices.²⁰ The bank would utilize the profits earned to promote infrastructure in a public-private partnership mode.

²⁰ The source of funding of the RBA is a critical variable in its financing and mode of operation. If funds are taken from official reserve assets, then the RBA must hold the funds in a liquid form in which they are readily usable in case of balance of payments need of the participating countries. Also, if the national contributors have a negative carrying cost on the contributions, it is unclear why the net profit from RBA investments should accrue to the RBA and not the countries. (Conversely, if the pooling of funds by the RBA permits countries to hold

The RBA would also be authorized to act like a regional monetary fund or central bank. It would have authority to provide balance of payments support to member countries when needed and to issue an Asian Currency Unit (ACU) as a parallel (co-circulating) currency that would be freely convertible internationally. These aspects are not very different from the concepts of the European Monetary Cooperation Fund (EMCF) and the European Currency Unit (ECU) set up in Europe in the 1970's.

The option of creating a co-circulating currency, as proposed by Agarwala (2008), is appealing in many respects, especially if it benefits economies undergoing financial turmoil that have weak and depreciating currencies. Other such proposals have been made, and in a sense the European Currency Unit (ECU) was almost a type of co-circulating unit of value that was used for public and private financial instruments in Europe. The Asian Infrastructure Currency Unit (AICU) proposed later on in this study has potential to develop into a co-circulating currency. However, there are many challenging operational aspects, such as solid funding of the alternative central bank, clearing and settlement, sharing of seigniorage, and not destabilizing regular currencies and monetary policies.

The creation of the RBA, combining functions of a reserve bank and an infrastructure financing bank like ADB, is without precedent and may not be feasible. In the past, ADB had performed the functions of the proposed RBA when it provided quick adjustment loans to some Asian crisis-affected countries, such as the Republic of Korea (hereafter Korea), but this was far more limited than the arrangement conceived by Agarwala (2008). Moreover, creating a formal regional central banking system parallel to national central banks, each with their own monetary policies and exchange rates, is challenging. It may be a better strategy to keep the investment aspects separate (handled by an expanded ADB that administers a new Asia infrastructure fund), and have a separate monetary institute that can promote a long-term financial integration program.

4.3.3. Multilateral and Bilateral Development Institutions

Multilateral development banks (MDBs) have an important role to play in reducing funding gaps if private sector funds do not meet financing needs. MDBs can also facilitate regional cooperation for the provision of regional public goods, such as sharing services and resources among neighboring countries through cross-border collective action and coordination. Through financing regional infrastructure, MDBs can assist countries in achieving the full potential of cross-border trade and investment, as well as improving their competitiveness in the region by reducing trade costs, especially cross-border costs, by helping to improve transport and logistics systems, procedures, and protocols and supply chain management.

MDBs, such as ADB and the World Bank, are already playing an important role in infrastructure development by creating bankable projects and mobilizing long-term funds through capital markets and arranging co-financing. Bilateral development banks or agencies like JICA and JBIC, are also playing a useful role, and similar bilateral development banks in major Asian economies, such as PRC, Singapore, Korea, and India, can also contribute to the provision of financing facilities. To reduce large financing gaps, MDBs need to expand their roles in mobilizing funding, particularly in arranging co-financing and providing loan and financing guarantees. Moreover, MDBs can create appropriate and innovative financial instruments for PPP projects to encourage private sector investment and can also promote further integration and enhancement of Asian financial market efficiency, liquidity, and depth, with adherence to international and regional standard best practices. This will enhance cross-border flows of capital and promote efficient infrastructure investment utilizing Asia's huge savings.

lower balances of reserve assets, it could permit the countries to make more profitable use of their funds.) If contributions to the RBA come from sovereign wealth funds or other national assets, the countries may expect to participate in any higher returns.

By acting jointly as money banks, knowledge banks, capacity builders, and honest brokers, MDBs can continue to support Asia's infrastructure development. Utilizing their AAA ratings and ability to raise funds in international capital markets at and lending funds with low spreads, MDBs should be active in providing loans and guarantees and catalyzing private sector financing. These institutions can also continue to be a key source of policy and technical advice, assisting in building the "soft infrastructure" (i.e., legal, regulatory, policy, customs, and procedural components) in member country governments and regional institutions. Finally, MDBs can play a key role coordinating multiple stakeholders for regional integration and infrastructure development. ADB's Regional Cooperation and Integration (RCI) Strategy passed in October 2006, for example, promotes: (i) cross-border infrastructure and associated soft infrastructure, especially greater cross-border physical connectivity and (ii) regional cooperation in the provision of regional public goods and avoidance of regional public "bads", (such as pollution and Green House Gas emissions). These kinds of roles and responsibilities by MDB activities in the region should be further enhanced to better facilitate regional infrastructure development and financing.

Asia needs to funnel its massive savings into "bankable" projects, primarily through bond market development and better use of savings and foreign reserves. In view of this, it is important to continue developing Asia's bond market (through the ABMI) to improve regional financial intermediation. MDBs can contribute to this process by providing further technical and research assistance to ABMI Working Groups and Focal Group of the ABM Initiative, stimulating market activities by issuing prime name credit papers and local currency bonds, promoting transparency and information dissemination, and contributing to policy dialogue.

In the past, ADB in particular has been a reliable funder of a large and broad variety of development projects in Asia, including cross-border infrastructure. It has historically offered traditional financing and other types of assistance at competitive rates, in the form of loans, equity financing, various financial risk guarantees, syndication arrangements, and technical assistance. More recently, it has also begun financing projects through the use of local currency financing, finance for trade facilitation, securitization, mortgage financing, and servicing of non-performing or under-performing financial assets (ADB 2008a). Clearly, there is room for greater assistance of MDBs in the development of cross-border infrastructure, either as sole investors or in partnerships with other institutions. Recently, ADB's capital has tripled to \$165 billion, which will facilitate mobilizing additional funds for infrastructure investment and poverty reduction in Asia (ADB 2009b).

MDBs can also promote projects that could be considered as "Aid for Trade", perhaps in coordination with the World Trade Organization (WTO). Aid for Trade, according to the WTO, is donor financing from developed and developing countries that is invested in soft infrastructure, such as trade-promoting infrastructure and assistance projects, including aid for supply chains and industrial (i.e., capacity) development. In 2005, a total of US\$15 billion was committed to Aid for Trade by highly developed countries, including US\$10 billion from Japan (ADB 2007). Such support continues to be forthcoming and assisting in structuring deals and projects so they meet the provisions of Aid for Trade programs is of great importance and is another way that MDBs can play an active role in obtaining increased financing for cross-border infrastructure.

4.3.4. Local Currency Bond Markets

The development of local currency bond markets is a key method to reduce foreign currency risk for borrowers and should be promoted to meet growing infrastructure financing needs. Developing these markets would also minimize currency and maturity mismatches, which were among the major factors behind the severe financial crisis in 1997–1998. Currency mismatch problems arise if countries borrow in foreign currency to finance infrastructure projects and the revenues are earned in local currency. On the other hand, if countries borrow foreign currency for the short-term or medium-term, but the cash flow lags after the

completion of the project, there could be maturity mismatch problems. This is a demand risk problem that can be addressed through official foreign currency guarantees.

Since the 1997–1998 financial crisis, Asian economies have undertaken considerable efforts to further develop and strengthen institutions and market infrastructure to enhance the growth of local currency bond markets. In 2003, finance ministers from ASEAN plus Japan, the People's Republic of China (PRC), and Korea introduced the ABMI. Several working groups were established to develop the infrastructure, regulations, and best practices of the local currency bond markets. Such an initiative can promote the utilization of Asia's savings and increasing foreign exchange reserves within the region, particularly for use in infrastructure development. The creation of standing working groups to promote the development of various aspects of financial market infrastructure is a strong step in the right direction and should continue to be aggressively pursued.

At the Madrid ADB annual meeting in May 2008, the commitment to the ABMI was renewed with a focus on promoting local currency bond issuance, facilitating demand for the bonds, improving the regulatory framework, and improving the market infrastructure. Efforts are voluntary, but each country is tasked to make periodic self-assessments in meeting the ABMI goals. All these steps, which are at the national level of integration with some regional oversight, appear to be moving in the right direction, but it remains to be seen how effective the approach will be.

MDBs, as banks with continuing involvement in capital markets, can play an important role in raising long-term funds for financing infrastructure projects, contributing to building market liquidity and depth and issuing local currency bonds by undertaking currency swaps. The ADB has been integral in developing Asia's bond market by providing technical and research assistance to ABMI Working Groups and the Focal Group of the ABMI; stimulating market activities by issuing prime name credit papers; promoting transparency and information dissemination; contributing to policy dialogue; and issuing local currency bonds.²¹

In order to attract private investors for local currency infrastructure bonds, the return should be attractive and high rated. According to a report by Asia Bond Monitor, the policy challenges for the development of a stable, deep, and strong bond market include:

- “(i) bolster investor confidence by strengthening legal protection and thus certainty, improve standards of corporate governance and transparency, and adhere to international accounting standards;
- (ii) reduce constraints to market entry, investment, and encourage investor diversity to promote greater demand for local currency bonds;
- (iii) develop derivative and swap markets to broaden the investor base, increase market liquidity, and allow a wider dispersal of risk; and
- (iv) strengthen broader arrangements for regulatory oversight and regional cooperation in the areas of information-sharing and in coordinated actions to maintain financial stability” (ADB 2008b: 1-2).

4.3.5. Asian Infrastructure Financing Bank or Fund

An important issue to be examined is whether Asia should establish a new, specialized investment bank for infrastructure financing similar to the European Investment Bank or the Andean Development Corporation (Corporación Andina de Fomento, or CAF). This bank

²¹ ADB has issued several local currency bonds. In October 2005, ADB launched its fifth market-opening transaction P2.5 billion (US\$45.37 million) peso-denominated bonds to develop Asia's local currency bond markets. Starting in early 2004, ADB undertook five other market-opening transactions in the region's local currency bond markets in India, Malaysia, PRC, the Philippines, and Thailand. In 2007, the ADB issued local currency bonds in Hong Kong, China; Kazakhstan; Malaysia; Philippines; and Singapore. Moreover, according to Asia Bond Monitor (2008), emerging East Asia's local currency (LCY) bonds outstanding increased at a very rapid annual 21% rate in the second half of 2007. Also, LCY government bond markets expanded by 21% in 2007, primarily due to central bank sterilization and fiscal stimulus. LCY corporate bonds grew by 20% in 2007, exhibiting the limited initial impact of the global credit crisis.

might serve to intermediate (through deposit facilities, bond issuance, and transactions services) the use of the large accumulations of official financial assets for infrastructure and other regional and development projects. Another alternative could be a new Asia Infrastructure Fund (AIF) which could be managed by ADB. This fund could be dedicated to regional infrastructure projects. The new bank or fund may consider issuing liabilities in the form of equities and bonds to be contributed by participating countries and multilateral and bilateral development banks as well as private sector using some standard measure to denominate investments, such as a regional currency basket. The participating countries can use a portion of their excess foreign reserve to purchase these bonds.

There have been previous proposals for establishing either an Asian Infrastructure Investment Bank (AIIB) or an Asian Infrastructure Finance Corporation (AIFC). For example, in 2007, Kim Hak-Su, executive secretary of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), stated that the region could learn from India's experiences utilizing special purpose vehicles for infrastructure investment. The region could authorize an entity such as AIIB or AIFC to borrow from regional foreign exchange reserves and both invest in capital and equity markets globally—using the returns to finance regional infrastructure projects—as well as provide direct lending for infrastructure financing (UNESCAP 2007). Agarwala (2005) judged that such an Asian Investment Bank (AIB) could provide infrastructure loans and collaborate with the banking community in both raising and investing resources. It could work with the private sector by co-financing and guaranteeing private investment financing. Even if only 50% of Asia's incremental current account surpluses during the next five years are put in these assets, there would be ample funding for the huge investment needs in these regional projects. Besides raising funds, this institution could also help regional countries address non-financial constraints that discourage infrastructure investment by the private sector; these constraints could be regulatory barriers, lengthy processes or procedures, and risks involved in long-term and large-scale investment (Jayanth 2007).

However, there would be many disadvantages in setting up a new investment bank. First, negotiation, planning, and implementation of a new large institution would be lengthy and possibly less cost-effective than using existing institutions. The bank would need to establish a credible track record to ensure trust and confidence among member countries and their private sectors. Furthermore, the overall cost of borrowing could be higher compared with established institutions due to the additional operational cost of the bank and the bank's initial smaller scale of operation and initial lack of the AAA ratings necessary for the bank to mobilize funds at a low cost in the international capital market.

It would also be challenging for a new bank to create an adequate knowledge base and expertise comparable to that of existing institutions, which is essential for winning the trust and confidence of participating Asian countries. Organizations such as ADB, the World Bank, and UNESCAP have solid track records in providing significant assistance for infrastructure development in Asia and conceiving and implementing cross-border projects under several subregional programs, such as Greater Mekong Subregion (GMS), South Asia Subregional Economic Cooperation (SASEC), Central Asia Regional Economic Cooperation (CAREC), Brunei Darussalam Indonesia Malaysia Philippines – East ASEAN Growth Area (BIMP-EAGA), and Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)²². For example, ADB has provided approximately US\$83 billion to date in infrastructure loans and grant financing in the region, and has strong financial and risk management capacity and practices and international-level disclosure standards. The resources of these organizations, however, are still limited and would be insufficient to meet the entire financing gap (ADB 2009a).

²² Greater Mekong Subregion (GMS), South Asia Subregional Economic Cooperation (SASEC), Central Asia Regional Economic Cooperation (CAREC), Brunei Darussalam-Indonesia-Malaysia-The Philippines-East ASEAN Growth Area (BIMP-EAGA), Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC).

In view of the above, an Asian Infrastructure Financing Fund (or a special vehicle fund) could be set up under an appropriate governance structure such as an affiliate, subsidiary, or trust fund managed by ADB. This fund should have its own resources or capital contributed from national governments of major Asian countries. In addition, this fund could intermediate and direct Asian savings to infrastructure development and assist in meeting the infrastructure investment gap by selling bonds for cross-border infrastructure finance, customizing instruments to fit market preferences, and potentially providing guarantees, incentives, and concessionary finance. It could also generate additional funds through co-financing from other development and financial institutions, SWFs, pension funds, private portfolio investments, and special vehicle funds. A portion of major Asian countries' excess international reserves could be utilized initially to set up such a fund. A new institutional framework for this fund would allow for more flexible rules, regulations, policies, systems, and procedures. This fund could be structured to identify, prioritize, prepare, and facilitate financing commercially viable regional infrastructure projects. For making the projects viable, the fund needs to provide guarantees against major risks (e.g. political risk, credit risk, and refinancing risk) faced by large cross-border projects, as well as grant and concessional financing to low-income participating countries. .

The advantages of this new infrastructure fund would include a more focused mission for specialized jobs like cross-border infrastructure financing, and the creation of simpler and more efficient systems and procedures, such as the quick processing of loans with few conditions that borrowing member countries find difficult to implement and can delay project implementation and increase project cost. Also, it would offer better customization and sophisticated techniques to meet borrower countries' needs and the utilization of Asian savings for Asian infrastructure in a cost effective manner. ADB/ADBI (2009) has proposed a similar Asian Infrastructure Fund.

4.3.6. Regional Infrastructure Companies for Financing Specific Sectors

Another alternative could be to create several regional companies that would finance and manage regional projects for specific sectors, such as transport (road, railways, seaports and airports), energy, and telecommunications. Major Asian economies could invest in these companies together, allowing for private sector participation at a later stage. Experts from various parts of Asia, and also from outside Asia, could be invited to join these companies. These companies could also raise funds from capital markets through equity or infrastructure bonds. Special sub-regional infrastructure funds could be created to finance sub-regional projects.

This alternative might take the form of the European Aeronautic Defense and Space Company (EADS), which would be jointly owned by Asian governments, public sector companies, or both together. An Asian infrastructure group for cross-border infrastructure development established akin to the EADS could be owned by Asian governments, relevant regional public sectors, and private sector firms with appropriate expertise in the infrastructure development. The sale of public shares throughout the region would help deepen equity markets and provide a needed outlet for household savings and institutions' investment funds. This group could own subsidiaries specializing in sectors, such as transport, energy, and telecommunications. Infrastructure companies need to specialize in a sector to earn credibility, and hence sectoral Asian companies (specializing in transport, telecommunication, energy, etc.) would need to be established. Subsequently, a significant portion of shares could be distributed to the public and employees to create a good governance structure. Multiple locations for operations could be selected depending on locations of planned cross-border projects.

4.3.7. Subregional Infrastructure Funds or Subregional Infrastructure Companies

There are already several subregional initiatives on infrastructure development in Asia, such as GMS, ASEAN, South Asian Association for Regional Cooperation (SAARC), CAREC, and

SASEC. Special subregional infrastructure funds could be created to finance sub-regional projects. Special subregional companies could also be established to manage these infrastructure projects. Such subregional institutions could work in a way similar to that described in sections 4.3.5 and 4.3.6. Recently, ASEAN has decided to set up an ASEAN Infrastructure Fund through ADB, which in turn is now preparing the fund's needed framework (Nam News Network 2010). It is possible that this fund could initially be established by major ASEAN countries utilizing their excess international reserves, and the other ASEAN countries would be allowed to join subsequently. Once this ASEAN Infrastructure Fund has been created, other major Asian countries could join to create an ASEAN+3²³ or an ASEAN+6²⁴ infrastructure fund. This process is similar to the pattern observed in the Asian trade integration using ASEAN as a hub and forming the ASEAN+1 free trade agreement.

4.4. Instruments for Financing Asia's Regional Infrastructure

4.4.1. Guaranteed and Linked Bonds

Infrastructure projects could also be financed through innovative bond structures that would include guarantees or enhancements to protect investors in terms of various risks, insulate borrowers from adverse changes in servicing costs, and customize issues to fit the specific needs of lenders and borrowers. Contemporary financial markets have become quite sophisticated in fashioning instruments to cover specific situations and to appeal to different classes of borrowers. Where these techniques could be married with availability of concessional finance, it could be possible to craft lending instruments that could strongly promote economic development.

Customization could involve enhancing instruments with one or more guarantees, links that would provide protection against specific types of risk, or spreading returns and risks to better fit the profiles of lenders and borrowers. A wide range of instruments could provide the enhancements—direct guarantees or insurance could be used, derivatives like forwards and options would be possible, income and expense flows could be capped, income flows could be swapped, instruments could be linked to commodity prices or other measures, etc.—depending on the specific borrowing situation and the sophistication of markets in crafting instruments. Types of risks and examples of instruments that could be used to mitigate them could include:

Risk	Instrument
Exchange risk	Exchange rate guarantees; Currency Baskets
Inflation risk	Inflation-linked instruments
Commodity price risk	Commodity price-linked instruments
Credit risk	Credit guarantees
Demand (traffic) risk	Demand (traffic) guarantees
Economic risk	GDP-linked instruments ²⁵

²³ ASEAN+3 is composed of ASEAN member countries plus PRC, Korea, and Japan.

²⁴ ASEAN+6 is composed of ASEAN+3 plus Australia, New Zealand, and India.

²⁵ GDP-linked instruments adjust payments to the speed of growth of GDP of the borrowing country. There is a growing body of literature recommending the use of GDP-linked bonds. For borrowers, they can lower debt service payments in times of economic distress, allowing for greater fiscal policy flexibility and lowering the probability of default. For investors, GDP-linked bonds provide opportunities to diversify portfolios and can offer high returns if payments are linked to nominal GDP growth. In this latter case, the borrowers are de facto protected from real obligations to make higher payments because of the larger size of GDP and also the possibility that there is an inflationary component in the higher nominal GDP.

See, for example: Borensztein and Mauro (2002), Griffith-Jones and Sharma (2006), Miyajima (2006), Schröder et al. (2004), and Shiller (1993).

Financial sophistication would be needed to design and implement the full range of these instruments. Cross-border issues would require additional skills to deal with differing institutions, practices, and legal frameworks. Only a limited number of institutions and markets could be expected to provide the range of skills required, which could reside both in public institutions and private markets. Asian financial market development would benefit from the building of such skills at ADB, other Asian public institutions, and also in key regional private markets. Infrastructure projects in countries that do not have the skills available domestically would have to have ready and cost efficient access to markets where they are available. ADB or other regional public institutions could deal directly with projects anywhere in the region, but it would also be important to have easy cross-border access to private markets in key financial centers within Asia.

4.4.2. Sovereign Wealth Funds

Several Asian economies, as well as economies of other regions, have created sovereign wealth funds (SWFs) to hold and invest part of their large holdings of international reserve currencies. This subsection examines the potential for SWFs, and other large national pools of investable funds such as national pension funds, to invest in Asian infrastructure. The specific character of infrastructure investments often fits the investment profile of SWFs. Moreover, the global financial crisis has highlighted the usefulness of regional infrastructure investment as an important source of stimulus funding as short- or medium-term countercyclical measures, but that also offers high, long-term economic benefits. It will describe an important initiative in this regard by ASEAN to set up a regional infrastructure fund that will draw on resources similar to SWFs, and which may become a model for use of SWFs for infrastructure funding.

The best source of information on SWFs is the initial report of the International Working Group on Sovereign Wealth Funds (IWG) that presents 24 voluntary Generally Accepted Principles and Practices (GAPP) for SWFs, called the “Santiago Principles” (IWG 2008).²⁶ SWFs are defined by the working group as:

“Special purpose investment vehicles or arrangements owned by the general government. Created by the general government for macroeconomic purposes, SWFs hold, manage, or administer assets to achieve financial objectives, and employ a set of investment strategies that include investing in foreign financial assets. SWFs have diverse legal, institutional, and governance structures. They are a heterogeneous group, comprising fiscal stabilization funds, savings funds, reserve investment corporations, development funds, and pension reserve funds without explicit pension liabilities” (IWG 2008: 3).

The formal definition of SWFs excludes foreign currency reserves assets held by monetary authorities for traditional balance of payments or monetary policy purposes, state-owned enterprises, government employee pension funds, and assets managed for the benefit of individuals. These are important exclusions, but for the purposes of this study on a case-by-case basis the investment profiles of such funds might include infrastructure investments. For example, state-owned enterprises might seek infrastructure investments ancillary to their main line of business. Thus, these non-SWF pools of investable funds might be approached with investment proposals, but they will not be further discussed here.

Many SWFs segregate funds into accounts separate from countries’ official international reserves to generate higher returns and many are explicitly designed to pass wealth to future

²⁶ The IWG was set up as an ad hoc group to determine the principles of conduct for SWF and treatments in host countries. The GAPP agreement is an important step forward in understanding the nature of SWFs and making them more accountable and transparent, but the code is voluntary and adoption by all SWFs is not assured. Work is underway to build on the achievements of the IWG to create a standing body to represent SWFs. See also IMF (2008).

generations, especially when the income is derived from exploitation of an expendable resource.²⁷ Although the capital and income from SWFs are intended for strategic or future use, the rules to draw on SWFs vary by country and have often not been transparent, although application of the GAPP could change that. It has been reported that during the crisis a number of SWFs have been tapped as stimulus funds for domestic projects.

In broad terms, three different types of SWFs can be distinguished. Different investment strategies and policy perspectives may apply to each type.

- **Commodity-based SWFs:** These SWFs are based on high returns from the production of commodities. Strong demand and favorable price movements for a commodity, such as oil, can result in rapid accumulations of foreign currency assets. These funds are unencumbered assets that are not associated with specific liabilities and thus can be freely invested by the SWFs in accordance with their directives. Countries with these types of SWFs may create them to isolate funds from the domestic economy, use them as stabilization funds to cushion drops in prices, or build long-term investment income to support the economy after the resource is depleted. The funds might also be domestically invested to help the economy diversify, but such investment must avoid destabilizing the economy.
- **Pension-based SWFs:** Some countries create SWFs from funds raised from pension or social security contributions (funds with explicit liabilities to individual pension holders are excluded). These funds must be invested with a long-term perspective and with recognition of the liability to cover future payments. Long-term infrastructure investments with stable return profiles fit the investment needs of this type of SWF well.
- **SWFs** for countries with a large current account surplus and large international reserve assets. The assets are often acquired due to sterilization of export earnings, which creates a liability to the public. PRC and several other Asian economies have this type of accumulation of foreign currency assets that can be used to fund SWFs. These types of SWFs often play a key role in the macro-financial stance of the country and can affect policies on exchange rates, capital flows, inflation, and money and credit. The investment strategies of these types of funds must not contradict the sterilization policies that led to their creation in the first place, but are otherwise flexible. Because this type of SWF is based on an explicit policy configuration, changes in the policies (such as an exchange rate appreciation or shifts in national absorption) can affect the SWF, including the possibility of slowing or capping the SWF's future growth. These types of SWFs may be constrained from making domestic infrastructure investments because they were launched to isolate the funds from the domestic economy, but they could do so if it is compatible with balanced macroeconomic conditions. However, they might be good sources for regional infrastructure funding.

Table 3 lists 13 Asian and Pacific countries (including Russia) that are often considered to have SWFs. The SWFs themselves have different functions and range in size. Estimates of the size of assets held by SWFs vary widely, but the Asian SWFs listed below appear to hold somewhere between US\$700 and US\$950 billion, which is about one-third of total assets held by the more than 30 SWFs currently operating worldwide. By size of total assets in early 2008, the largest SWFs in Asia were in the PRC, Singapore, Russia, and Australia.

²⁷ International reserve assets serve a special purpose to be available for exchange rate policy and to deal with balance of payments imbalances. According to the IMF definition of reserves, they must be readily available and in a readily convertible currency, SDRs, or monetary gold. The requirement that reserves have high liquidity precludes their use for long-term investments, such as those made by SWFs. Countries with reserves exceeding balance of payments needs can transfer them to SWFs to allow for their long-term investment. Also, income generated on international reserves is usually low (and sometimes negative, net, if reserves are built up by issuing high-interest rate liabilities to sterilize the monetary impacts of foreign currency assets held by the public). SWFs have the flexibility to invest in higher return assets.

Table 3: Selected Asian Sovereign Wealth Funds

Country	Sovereign Wealth Fund
Australia	Australian Future Fund
Azerbaijan	State Oil Fund
Brunei Darussalem	Brunei Investment Authority
PRC	China Investment Corporation (CIC)
Iran	Development Fund
Kazakhstan	National Fund
Kiribati	Revenue Equalization Fund
Korea	Korea Investment Corporation
Malaysia	Khazanah
New Zealand	New Zealand Superannuation Fund
Russia Federation	Oil Stabilization Fund
Singapore	Government Investment Corporation Temasek
Timor-Leste	Petroleum Fund
Viet Nam	State Capital Investment Corporation

Most SWFs are professionally invested to earn good market returns that exceed the earnings on official international reserves, which usually are invested in very safe, low return assets. SWFs are typically granted wide latitude in making investments, including in equities. Although most SWF investments are in foreign countries, investments within the home country or within a region are also common. Investments at home can be made for national strategic development purposes; for example, the Libyan SWF directly makes domestic infrastructure investments (IWG 2008). As noted previously, the appropriate investment strategy can differ depending on the type of SWF funding, the associated liability, and the public policy goals of the SWF.

The GAPP makes it clear that there is great diversity in SWF investment strategies. Domestic investments are made by some SWFs, and some SWFs may address social, environmental, or other factors in their investment policy. Whenever investments are made on such grounds, the GAPP recommend that the policies should be publicly disclosed (IWG 2008).

Infrastructure projects appear to fit the investment profile of many SWFs because of their size, long-term tenor, competitive returns, ability to diversify portfolios with cyclically or financial market uncorrelated investments, and because they often have investment guarantees. Moreover, the current turmoil in global financial markets may shrink other investment opportunities and increase the competitiveness of infrastructure investments.

Also, a point made strongly in the GAPP is that investment strategies must respect macroeconomic and macro financial limitations; they must not contribute to overheating of the domestic economy or contradiction of sterilization, exchange rate, or capital flows policies. SWF activities can affect domestic fiscal and monetary conditions and therefore should fit within a country's overall macroeconomic policy framework and coordinated with domestic authorities. Several of the Asian SWFs have activities that involve exchanges between domestic and foreign currencies, which may affect monetary conditions, exchange

rates, and domestic demand and that must be subjected to regular macroeconomic policy oversight as national macroeconomic or financial policies would be affected.²⁸

Currently available information about the activities and governance of SWFs is still limited, but has improved in recent years. SWFs that implement the GAPP would provide substantially more information, reporting in line with host country or international standards and improving both internal and external reporting, and such SWFs would provide regulatory and statistical information for use in macroeconomic accounts.

Several prominent SWFs have made public statements regarding their goals and policies. They clearly seek to assure the public and officials in host countries that investment decisions have been based on commercial considerations only and that there should be no fear of political or other motivations. Overwhelmingly, the investment goals are to produce long-term gains, competitive with market returns or better. Two SWFs pay regular dividends to the government, two invest in accordance with guidance from their governments on the types or allocations of investments and the situation with the others in each case is uncertain.

The information in these statements provides some clues about how SWFs may respond regarding possible investments in infrastructure. Overall, using SWFs to induce substantial investment in infrastructure is challenging because this type of investment is still unfamiliar to most SWFs and their investment managers. It does not fit into a seeming preference for more arms-length investment, and may not generate the higher returns that SWFs are seeking. However, the long run tenor of infrastructure investment and the opportunity to diversify and hedge cyclical exposures may make it an attractive investment for some SWFs. Investments packaged with exchange rate or traffic guarantees could be especially interesting for SWFs.

SWFs could become a regular source of funding for infrastructure within the home country and within the region, but because of the limited information about them and the diverse objectives of SWFs, it is hard to be specific about under what conditions and how much they would be willing to invest in infrastructure projects.²⁹ Although there are major uncertainties, a strategy for drawing on their resources for infrastructure investment is proposed below.

First, planning for infrastructure development should involve a serious commitment to attempt to tap SWFs to support Asian cross-border infrastructure investment. This type of commitment should be initiated early in the project planning process and should involve SWFs within the affected region and outreach by organizations such as ADB to SWFs in other Asian countries or in the Middle-East. This early interaction with SWFs will allow customization of financial packages to fit the preferences of SWFs. Also, the strong profit motivation of SWFs will require that infrastructure investment proposals provide market returns or better. Attracting investment by SWFs may require extension of enhancements or guarantees by governments, development banks, etc. to ensure that investments are secure and profitable.

SWFs often are expected to invest to support national strategic economic development priorities, so it could be argued that infrastructure investment is a natural area of investment that supports the strategic development strategies for the country. SWFs could adopt a strategy to create mixed and hedged portfolios, along the lines of commercial practice, of which part will be in long-term infrastructure investments. Here, a target of 10% investment

²⁸ By extension, regional, cross-border, or international investments by SWFs can also have macroeconomic ramifications on the host countries that need to be considered by the host country or by regional authorities.

²⁹ For purposes of how SWFs could support infrastructure finance, precise definitions of the type of SWF are not needed. Various types of large state funds exist, with different legal standings and purposes. Any of them could be potential investors in infrastructure and thus it is not necessary for this purpose to draw precise distinctions between the types of funds. For other purposes, taxation or prudential supervision for example, precise definitions will be needed.

in Asian infrastructure is suggested.³⁰ Equity investment by SWFs could also be encouraged, especially when the pattern of returns is uncertain or cannot be easily valued. Equity investments would be well suited to situations where the returns on the infrastructure have social or welfare benefits, such as educational or health benefits.

Finally, a portion of SWF funds should be used as official development assistance (ODA), although tapping SWFs set up as pension funds for ODA may be inappropriate. ODA contributions by SWFs are not explicitly mentioned in the GAPP, but the GAPP recognizes that social or environmental factors could be taken into consideration in lending. For ODA, a target of 1% is suggested.³¹ This contribution recognizes that SWFs are official institutions subject to national policy priorities, and one strategy could be to focus any development aid into areas of financial market development and technical capacity in the financial sector. In Islamic finance, there is a *zakat*³² obligation for those that can afford it to provide a portion of earnings (2.5%) to the poor. The earnings of SWFs of Islamic states could be sources of *zakat* as ODA to those in need. Very roughly, annually this might equal about 0.1 to 0.2% of SWF asset holdings. To take an arbitrary example, this could amount to US\$20 to US\$40 million annually from Malaysia's Khazanah Fund.

On 2 April 2008, the World Bank proposed the "one-percent solution", that SWFs invest 1% of their nearly US\$3 trillion assets in Africa, or about US\$30 billion (Mufson 2008). The proposal stressed equity investment. This total is significantly large, but for individual SWFs, does not represent a critical risk and less than needed for prudent diversification of the portfolio. Following this suggestion could bring some emerging economies into the group of providers of ODA.³³ Alternatively, rather than make direct contributions, the SWFs might transfer funds to other government agencies that specialize in aid or capacity building.

The receptivity of SWFs to making infrastructure investments is yet unknown. Some may be hesitant to take direct equity positions, but be willing to invest in securities based on the infrastructure investment or take equity positions in companies making the investment. A high level inquiry into SWFs and their governments (or the proposed standing organization of SWFs) might help to learn more about the potential and the conditions, and solicit views from SWFs on how they might contribute to infrastructure investment in Asia.

An important note of caution is that the use of SWFs for infrastructure investment in the home country or in other Asian countries could have macroeconomic or financial ramifications. Any SWF investment in infrastructure in the home country or elsewhere within Asia should be scrutinized to see that it does not contribute to overheating or contradiction of sterilization or other policies. One implication is that new regional oversight arrangements may be needed that bring SWFs under macroeconomic surveillance as an integral part of the overall macroeconomic and macrofinancial policy framework. An excellent example, identified by Radhakrishnan (2008), is India where a SWF has not been created, but the policy has been to channel reserves accumulations into infrastructure. In one promising, but

³⁰ Estimates of total assets of Asian SWFs are imprecise, but 10% devoted to infrastructure would be around US\$70 to US\$100 billion. This portfolio adjustment would require several years, so the annual contribution, which might reasonably total less than US\$20 billion per year, would clearly cover only a small portion of the annual financing gap.

³¹ A 1% ODA contribution from total Asian SWF assets might yield something between US\$7 billion and US\$10 billion annually, which is a large amount. It could be a direct contribution, but could also be leveraged into more investment if it enhances private lending. ODA provided by SWFs could be used in many ways, but one interesting option is to use it to provide enhancements to financial instruments issued for infrastructure projects, including instruments purchased by the SWF itself. Enhancements can include exchange rate guarantees, credit guarantees, coverage for grace periods, subordinated capital contributions, traffic guarantees, etc.

³² *Zakat* is essentially a wealth tax. For more information, see Sulaiman (2003).

³³ For example, World Bank President Zoellick said that government-sponsored funds could invest equity in development, which would allow emerging countries to join the 185-nation development lender's aid program, through the support of their SWFs. Such contributions would avoid allegations sometimes made that bilateral aid is politically motivated (Mufson 2008).

still relatively small, program (US\$5 billion), India Infrastructure Finance Co. Ltd. set up an offshore subsidiary in London that can borrow reserves and lend them on to Indian infrastructure companies to meet their capital expenditure solely outside India. The main condition is that such financing should not lead to any domestic absorption of liquidity.

Finally, two initiatives could serve as models for infrastructure investment that may apply to SWFs. Asia can create an Asian SWF dedicated to infrastructure development out of excess international reserve assets. Many state-owned enterprises in major Asian countries have been witnessing high savings and profit. Asian countries can also form national infrastructure funds based on the contribution of a portion of the excess profit of major state-owned enterprises.

4.4.3. Mobilizing Funds from Islamic Financial Markets

Islamic finance has a distinctly different form than conventional finance—no interest, no fixed returns, sharing of risk, prohibition of certain types of investment, and obligation to contribute to the poor, among others.³⁴ It is a growing field, but practices still vary and are unsettled, affected by differing interpretations of Islamic financial law. In many ways, it increasingly emulates the results of financing with conventional instruments, but sometimes with difficulty or inefficiency. While there are cases of blurring with conventional instruments, it remains largely separate from conventional finance.

Zeti Akhtar Aziz, the governor of Bank Negara Malaysia (Malaysia's central bank), has argued that Islamic financing will be critical to the future development of infrastructure in Asia. At the London *Sukuk* Summit in June 2007, she mentioned that the global *sukuk* market is estimated to be US\$18 billion and these funds could be utilized to increase liquidity in the Islamic world. The Islamic bond market has typically been 10 to 20 basis points lower than mainstream bonds, but more multilateral agencies are issuing *sukuks* to finance development projects and government agencies and the corporate sector have considered doing the same (Aziz 2007).

One major issue facing the prospect of utilizing Islamic finance for infrastructure investment is the shortfall of basic banking and savings instruments for Islamic populations. Many of the more than one billion Moslems in Asia have no, or limited, access to modern financial instruments. In some cases, Moslems may need to use conventional banks and instruments, but compensate through actions such as donating interest earnings as *zakat* contributions to the poor. The lack of basic banking facilities imposes major hardships on this population segment, which is denied the means to save and transact. Development of Islamic instruments to serve basic individual and community financial needs and effectively delivering them to the target population would have two important impacts. First, it would contribute to poverty alleviation for a very large population and, second, it would mobilize the savings of a very large population in ways that might help support infrastructure development. By taking action on increasing access to basic, Islamic financial services, over time a new pool of Islamic investment funds could be developed.³⁵

Another major issue in Islamic finance for infrastructure investment involves bonds and equity participation. Markets for Islamic bonds and equity participation exist, called *sukuk*, which are based on principles of sharing of the profit or loss of investment projects. Kuala Lumpur and Dubai are currently the most active markets, but there is some activity in other Asian markets as well. Islamic bond and equity participation instruments are naturally suited for project finance and their potential should be explored through consultations early on in

³⁴ For information on the background and characteristics of Islamic finance, and prospects for its future development, please refer to ISDB/IFSB (2005).

³⁵ Noibi (2008) of the Islamic Development Bank has said that Takaful instruments, which are a form of collective insurance, seem to be an appropriate means to gather funds within Islamic communities and provide financial protection for the individual contributors. Also, Ibrahim (2008) has said that injunctions to fight poverty are pressure to move Islamic finance to adopt microfinance programs.

the project development process so that the financing plan can be tailored to the specific requirements of Islamic finance.

Prospects for using Islamic bonds to support infrastructure funding are also limited because of difficulties in constructing long-term instruments that are not specifically tied to sharing of income or loss on specific projects, which is not in the nature of many types of infrastructure projects, and because of lack of standardization of instruments because of unharmonized *Shari'a* (Islamic law) interpretations, which acts to segment the market and prevent development of market signals that can help direct the flow of funding into high priority infrastructure projects. The Islamic Financial Services Board's "Ten Year Framework and Strategies" states that harmonization of *Shari'a* interpretations and effective legal interaction with conventional finance will play an important role in fostering greater growth of the industry (ISDB/IFSB 2005). This is obviously a specialized topic related to infrastructure finance, but mobilizing Asian savings and directing them to Asian and subregional infrastructure development will need to address how to involve the large Moslem community.

Working with the Islamic Development Bank (IsDB), which channels donations for investment in infrastructure among other things, is another way that Islamic financing could be used for Asian infrastructure projects. Projects should consider how IsDB programs might link to ADB or other regional infrastructure initiatives, or how the IsDB programs might evolve to provide more support for infrastructure. In the past few years, the IsDB has begun issuing *sukuk* bonds in international capital markets, which opens the potential for future issuing of bonds focused on infrastructure development (Gulfnews 2005). In September 2008, the IsDB and ADB signed a co-financing agreement in which both institutions stated that they would collaborate on projects in common member countries.³⁶ Each will contribute US\$2 billion from 2009 to 2012 for a range of projects, including infrastructure projects. The agreement also opens new avenues to promote infrastructure investment by third party funds and through private sector participation (Gulfnews 2008).

Significant funds for infrastructure investment should be available through Islamic bond and equity markets in Kuala Lumpur and the Middle East. This requires that consultations begin during the planning stages of infrastructure projects on how to configure the financial package to meet *Shari'a* requirements and to appeal to Islamic investors. Also, currently each project requires customization to meet Islamic requirements, but work is underway to create standardized documentation. This will greatly facilitate the process. ADB could create a small working group on Islamic Finance for Infrastructure to work primarily with the Islamic Financial Services Board in Kuala Lumpur and the Islamic Development Bank (IsDB) in Jeddah to promote this standardization and explore the potential for expanding Islamic financing. The recent announcement of collaboration between the ADB and IsDB is a promising step in the right direction.

4.4.4. Public-Private Partnerships (PPP)

It is expected that the bulk of financing for new physical infrastructure (greenfield projects) and maintenance or upgrading of existing infrastructure (brownfield) projects will come from the public sector, ODA, or multilateral development banks, but the private sector also can contribute substantial amounts, up to perhaps 30% of total investment needs. For example, for the estimated investment in India, as mentioned above, the private sector is expected to contribute around 30% (about US\$150 billion) of the total infrastructure spending, whereas the federal government will invest a further 37.2% and provincial governments will cover the remaining 32.8%.

PPPs are required not only for funding, but also for technology and efficiency in the project implementation. In order to attract private sector funds, Asian governments need to create

³⁶ Countries include: Afghanistan, Azerbaijan, Bangladesh, Indonesia, Kazakhstan, Kyrgyz Republic, Maldives, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.

good business environments and find ways to manage potential projects risks that cannot be addressed by the private sector. PPP projects could be undertaken through various modalities, such as joint ventures, concessions, management contracts, BOO (Build Own Operate), BOT (Build Operate and Transfer), BOOT (Build Own Operate Transfer), and BOLT (Build Own Lease Transfer)³⁷.

One of the major weaknesses of Asian developing countries is their level of skills and capacities in handling PPP projects, particularly in their procurement and service delivery. At the same time, the private sector should consider PPP infrastructure projects as a new market opportunity. They need to gather market intelligence and conduct appropriate technical analysis to evaluate and prepare bankable or commercially viable projects in developing countries. At present, there exists a significant information asymmetry between the public and private sector regarding infrastructure development. Further details on the potential for PPP options are discussed in another paper prepared for the ADB/ADBI Flagship Study by van der Geest and Nunez-Ferrer (2010).

4.4.5. Asian Infrastructure Currency Unit Based Bond (AICU)

The lengthy implementation of infrastructure projects exposes borrowers and lenders to substantial currency risk, which is one of the major risks for financing regional projects. This calls for financing schemes that can minimize exchange rate risk. One way to minimize exchange rate risk would be to create an Asian Infrastructure Currency Unit (AICU) consisting of major Asian and non-Asian advanced economies' currencies. An AICU is simply an accounting device for use in valuing infrastructure investments and repayment obligations that equals some weighted measure of Asia and non-Asian currencies. An infrastructure AICU bond will have reduced exchange rate risk for Asian lenders and borrowing countries based on *de facto* relative stability between Asian currencies.³⁸ The AICU could be a precursor to the type of parallel currency described by Agarwala (2008), but it lacks many of the features of a true currency as it is basically just an accounting device.

The weights may depend on factors such as GDP, international reserves, trade or any other appropriate variable of those selected economies. A weighting scheme that uses the basket of currencies used for infrastructure investment itself merits consideration. Total infrastructure currency demand in Asia could be estimated, providing a measure of value related to the costs and benefits of the infrastructure projects. Investors would gain access to investment instruments using a standard measure of value that has muted exchange rate risk; borrowers would be able to raise funds that have value related to projects' costs that would also have the feature of muted exchange rate risk. One variant of this weighting scheme includes only the weights of currencies estimated needed for infrastructure investment in Asia (or in a subregion such as ASEAN). A second variant adds the currency requirements for official funding of cross-border initiatives in Asia, such as funding of a development bank. In the second case, countries would pay their official obligations in AICU, giving it a natural initial market.

Europe created a similar valuation scheme that evolved over time, beginning with the European Unit of Account (EUA) and changing into the European Currency Unit (ECU) in 1979, which ultimately became a real currency, the euro. The EUA was established as a "closed" basket of fixed quantities of the nine EEC currencies. In contrast, the ECU was intended to be revised every 5 years. The ECU was initially a virtual currency, with settlements made in other "real" currencies. Subsequently settlements were made in ECU. The synthetic ECU currency unit was also used for denomination of bonds, including private sector bonds. Many Asian countries cannot issue bonds denominated in their own currencies, but if AICU is established, they could issue AICU bonds. This would diversify

³⁷ For more details on PPP modalities, please refer to Finlayson (2008) and van der Geest and Nunez-Ferrer (2010).

³⁸ Should Asian countries collaborate in the future to enhance policy coordination to make the exchange rates between countries more stable, the exchange rate risk of the AICU would be further reduced.

their risk by not issuing bonds in one international currency but in a basket of Asian currencies (Castell et al. 2007). Creating a virtual unit such as the AICU should involve surveillance of the participating currencies by a regional entity because changes in any currency in the basket affects the weighted average value and could force fellow participants in the scheme to make adjustments as a result of poor policy of another member. Thus, each currency should be obligated to bear the burden of macroeconomic surveillance because all currencies are affected by the actions of each individual currency (this oversight feature is in line with the proposed Asian Monetary Fund (AMF)³⁹ or Asian Surveillance Unit⁴⁰ model, in which a transnational oversight entity is created.

It would be useful to create an institution for managing regional infrastructure financing bonds (or build such capability into existing institutions). Countries participating in a regional project could raise funds through AICU denominated bonds, which would minimize the risk of repayment for any individual country. The entity might also include arrangements to guarantee AICU-denominated bonds issued by public entities, or provide insurance for a fee to private issuers.

5. FRAMEWORKS TO SUPPORT FINANCIAL MARKET DEVELOPMENT AND INTEGRATION IN ASIA

In addition to specific programs that promote infrastructure finance, efforts should also be made to enhance and harmonize the legal, institutional, and governance frameworks in ways that support cross-border investment and contribute to the general stability and effectiveness of financial markets. The experience of Europe highlights the very important roles, albeit indirect, that building harmonized frameworks had on the effectiveness of financial markets. Similar steps in Asia can contribute to making effective use of Asia's savings to support its own infrastructure investment and development.

5.1 Harmonization of Financial Practice and Infrastructure

The experience in Europe strongly emphasizes the importance of creating an overarching framework of comparable practices, infrastructure, and codes affecting the financial sector. The ability of an economy to attract investment is seen as depending on creating a stable environment in which investments are secure, macroeconomic risks are minimized, and competitive conditions result in unbiased market signals that attract investments. Financial market distortions can arise from many sources, and the Europeans have methodically attempted to increase harmonization between countries as a necessary part of creating a unified financial system for Europe. Areas of potential harmonization include bankruptcy codes, licensing, financial accounting, dispute resolution, provisioning and recognition of impairment, taxation, capital adequacy and other supervisory requirements, disclosures, and income repatriation, among others. Asia should systematically review where infrastructure, standards, and practices hinder equal treatment of cross-border investments or create frictions in cross-border flows. Coordinated efforts in Asia should be taken to introduce harmonized practices and in some ways this process is already underway as countries implement international standards and best practices. These efforts should be strengthened and accelerated (including providing significant technical assistance to poorer economies), because they offer—in addition to their other benefits—ways to strengthen the effectiveness of financial markets. The improvements will enhance the general investment atmosphere in Asia, and help in infrastructure financing.

³⁹ See Rajan (2000) for more details on this proposal.

⁴⁰ See ADB (2009c) for more details.

As mentioned, the impediments to regional integration are both non-financial and financial in nature. In Asia, work on dismantling non-financial barriers seems to be progressing steadily, as can be seen from Soesastro's (2007) discussion on how the ASEAN Economic Community (AEC) Blueprint focuses on integration of trade and infrastructure and supporting institutions and policies. Progress is also being made on the financial side, especially by ASEAN working groups, but it appears that this effort could be intensified.

5.2 Regional Mechanisms for Macroeconomic Oversight

Macroeconomic stability is important in reducing risk that can hinder infrastructure investment. Poorly designed macroeconomic policies can make investments in specific countries unattractive and can result in recessions, high inflation, volatile exchange rates, etc. Good macroeconomic policy making is thus a precondition for infrastructure investment. Also, cross-border investment would benefit from coordinated macroeconomic oversight to promote macroeconomic stability in all affected countries, and to coordinate in areas such as defending a configuration of exchange rates. A strong macroeconomic oversight and policy development apparatus is needed—the Chiang Mai Initiative (CMI) was a movement in the right direction, but it has faltered in this regard—and the type of structured oversight and consultation offered by an institution such as an AMF should be seriously considered.

The Chiang Mai framework includes a provision for “Economic Review and Policy Dialogue” at regular intervals at the minister and deputy levels to work towards prevention of financial crises and swift taking of remedial actions. Recently, there has been increased discussion about strengthening the CMI, including raising the size of potential rescue packages and strengthening the oversight function to build a credible system in ASEAN+3 to monitor the economic and financial situation of member countries. Such a strengthening of CMI would further its functions for effective Asian macroeconomic oversight. ASEAN+3 countries have agreed to set up an ASEAN+3 Surveillance Unit in Singapore (ASEAN 2009). This is a strong step towards building an AMF.

Bolstering macroeconomic stability will require dealing with the cluster of related issues associated with the large accumulation of reserves, exchange rates (external and between Asian countries), inflation control, monetary sterilization, stability of inward and outward capital flows, and sovereign wealth funds. These have become regional issues and a regional oversight and policy development entity should be created to handle them. Such a regional entity or institute could also function to determine how the large accumulation of reserves and SWF assets could be channeled into investment in Asia.

5.3 Regional Mechanisms for Financial Stability Oversight

A similar line of argument applies to financial stability. A strong banking system, well-functioning securities markets, reliable payments systems, etc., all supervised by effective regulators, are needed to maintain financial stability. A coordinated effort by financial sector regulators is called for to create stable financial conditions that can bolster infrastructure investment flows. Creating an Asian equivalent to the Financial Stability Board now embodied in the proposal for an Asian Financial Stability Dialogue (AFSD) by ADB President Kuroda is recommended to facilitate this coordinated effort. Among tasks for the AFSD would be to identify and promote high quality standards and practices throughout Asia, support development of mechanisms for cooperation between national supervisors (in all financial subsectors), and address issues related to crisis management and lender of last resort situations (ADB 2008c). The AFSD should also take steps to ensure that rapid changes in financial markets associated with the globalization of finance or integration of regional markets do not introduce new risks to financial soundness. Finally, the current turmoil in international financial markets provides a sharp warning to all Asian countries that preventive steps to avoid financial distress in Asia are an extremely high priority, and that

there is an urgent need for an institution such as the AFSD to address threats to Asian financial systems.

5.4 Final Thoughts: Global Financial Crisis as a spur to Asian Integration

The financing of national and regional infrastructure in Asia for increased connectivity and integration should be viewed in the context of the ongoing global financial and economic crisis and the rebalancing of the global financial system, including its governance and the building of a sustainable, integrated, resilient, and balanced Asia. The severity and global nature of the crisis has forced many changes—among them is a new view that the macroeconomic policies being followed in Asia were components of global imbalances that need to be redressed. One piece of the rebalancing is that Asia must become more inward oriented so that more of its savings shift from short-term investment in external markets toward regional long-term productive investments, of which infrastructure investment is ideal. Providing appropriate market infrastructure (investment tools, integrated markets, innovative and cost effective financing options, clearing operations, good cooperation and coordination frameworks, sound rules and regulations, stable internal and external macroeconomic and macroprudential conditions, and business environments conducive to private sector participation, among others) would bolster the development of efficient and secure markets in which long-term, cross-border infrastructure investment could thrive. All this simultaneously would help create rebalanced, resilient markets that could be part of the solution to the crisis. This would facilitate Asia's move toward rebalanced growth, with less dependence on exports to advanced economies, increased intraregional trade, and increased regional demand and consumption.

The development and integration of Asian financial markets could serve twin goals. It could enhance Asian integration through enhanced regional connectivity – financing the development and implementation regional infrastructure projects—which would have high pay-offs for all participating countries. At the same time, Asian financial and technical resources could be effectively mobilized and allocated to meet the large investment needs in productive sectors like infrastructure

Both the prevention and management of crises and the building of regional infrastructure require a high degree of cooperation and partnership between countries so that increasingly common solutions can be offered and policy and technical friction between countries can be minimized. Regional efforts, such as the CMI or the renewed commitment to the ABMI, are pointing a way, as are various calls to create regional macroprudential or financial cooperation entities. Efforts are becoming more cooperative—at this point most are multi-country in nature, but over time some elements may become more supranational—and a process of integration of aims and methods is underway, spurred both by technical advantages and by the financial crisis. Regional infrastructure investment and development for seamless Asian connectivity is both a beneficiary of, and contributor to, this evolution.

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