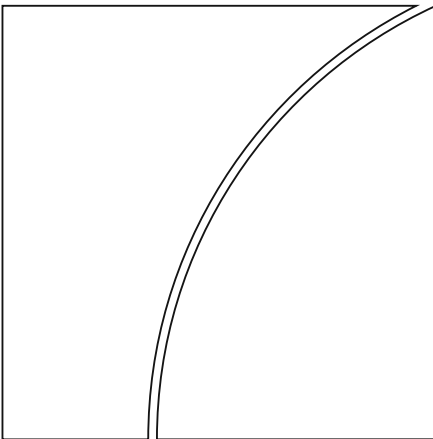




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### A spare tire for capital markets: Fostering corporate bond markets in Asia

A report prepared for EMEAP by Marlene Amstad, Steven Kong, Frank Packer and Eli Remolona at the request of Mr Grant Spencer, Deputy Governor of the Reserve Bank of New Zealand and Chair of the EMEAP Working Group on Financial Markets

Monetary and Economic Department

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# A spare tire for capital markets: Fostering corporate bond markets in Asia<sup>1</sup>

## Abstract

The eight local currency bond markets in which the Asian Bond Funds 2 (ABF2) invests have continued to develop since 2011. But the development of corporate bonds continues to lag that of government bonds. We focus on areas where we believe there remains work to be done to foster corporate bond markets. In primary markets, we suggest measures to expand the range of credit quality and develop infrastructure bonds as an asset class. In secondary markets, we recommend enhancing liquidity through developing regional mechanisms to increase post-trade transparency as well as through developing hedging markets. In repo markets, there may be room for conducting a survey to fill information gaps and identify where policy actions might have the greatest effect.

JEL classification: G18, G23, G24, H54, H63

Keywords: Corporate bonds, credit ratings, infrastructure finance, post-trade transparency, foreign exchange swap markets, repo markets

<sup>1</sup> This report was prepared for EMEAP at the request of Mr Grant Spencer, Deputy Governor of the Reserve Bank of New Zealand and Chair of the EMEAP Working Group on Financial Markets (WGFM). It was prepared by Marlene Amstad, Steven Kong, Frank Packer and Eli Remolona. It draws on interviews with financial market participants as well as regulators and central bank staff in several of the EMEAP economies. The authors especially wish to thank Diwa Guinigundo, Philip Lowe, Anella Munro, Sukhdave Singh, Grant Spencer and Philip Turner for their comments, as well the members of the WGFM more generally. The views expressed in this report are those of the authors and do not necessarily reflect those of the Bank for International Settlements or EMEAP.



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## Executive summary of issues and policy recommendations

*(A spare tire for capital markets: Fostering corporate bond markets in Asia)*

<b>Issues</b>	<b>Recommendations</b>	<b>Section</b>
<b><i>Primary Market</i></b>		
Incomplete credit curve / Few bond issuers with medium to low credit ratings	Lower or remove minimum credit rating requirements for institutional investors	3
Low supply of project-specific infrastructure bonds	Establish and announce pre-eligibility criteria for project-specific bonds in which EMEAP members would consider investment	4
<b><i>Secondary Market</i></b>		
Fragmented PTT schemes in ABF markets	Coordinate and standardize post trade transparency requirements within EMEAP markets	5
Limited liquidity in some markets to hedge FX risk	Remove remaining impediments to the use of hedging instruments whenever possible	6
Information gaps in local repo markets	Conduct or request a survey be undertaken by ASIFMA	7

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## 1. Introduction

In 2011, at the request of the Executives' Meeting of East Asia Pacific Central Banks (EMEAP), the BIS Representative Office for Asia and the Pacific authored a review of local currency bond markets in the region. The report concluded that while there still remain some challenges the government bond markets in the region had for the most part developed well enough to play their appropriate roles in the economy and that the ABF2 initiative had served as a catalyst for the development of these markets. The report also concluded, however, that corporate bond markets had developed to a much more limited extent. However, corporate bond markets can perform a useful role for capital markets as a "spare tire",<sup>2</sup> to be available in periods when the banking system seizes up and equity markets decline. And from the perspective of longer term financial development, research suggests that bond markets are complementary to bank financing, and thus can serve as a valuable addition to financial systems mostly dependent on indirect financing, as are common in Asia.

Four years after the 2011 report, the EMEAP Working Group on Financial Markets, chaired by Deputy Governor Grant Spencer of the Reserve Bank of New Zealand, turned to the BIS again. The working group asked the BIS to update its study of domestic bond market development and to review specific aspects of local currency bond markets in an "Asian Capital Market Report". In response, the present report not only provides a brief update of the local currency bond markets but also elaborates on specific issues with regard to the corporate bond markets. These issues include the narrow range of credit quality, the limited role of infrastructure bonds, the lack of liquidity in secondary markets and the relative underdevelopment of hedging instruments and repo markets.

Hence, there remains important work to be done. Various restrictions on institutional investors could be relaxed to widen the range of credit quality in the market. Jurisdictions could foster simple, transparent and comparable standards for project finance, and infrastructure bonds, in particular those issued by private-public partnerships (PPP), could be used to further diversify the corporate bond market. Market liquidity could be enhanced by greater coordination and standardization of post-trade reporting requirements, as well as freer access to FX hedging instruments in some markets. In repo markets, standardized legal documentation and greater certainty about the resolution process could support the market making activities of dealers.

To identify where policy actions might have the greatest effect, it may be worthwhile for EMEAP to conduct a survey, or to request a survey be undertaken from the Asia Securities and International Capital Markets Association. The European Repo Council of the International Capital Market Association (ICMA), for example, conducts a survey of its members twice a year asking about the value of repo and reverse repo contracts outstanding, as well as currency, counterparty, contract terms, settlement methods, etc. However, no such regional survey yet exists across Asian jurisdictions. For EMEAP, the survey could also include questions about the market for corporate bonds and project bonds.

<sup>2</sup> The term "spare tire" originates from a speech by Alan Greenspan (1999) and refers to an alternative for corporations to the lending of the banking system.

While challenges remain in government bond markets, particularly related to liquidity, the principal focus of the current report is fostering the development of corporate bond markets. The rest of this report will proceed as follows. In the next section, the report reviews the growth of local currency bond markets over the past four to five years, since the publication of the previous special report for EMEAP in 2011. The following sections each cover a specific issue still to be addressed and each is accompanied by a policy recommendation. Sections 3 and 4 cover the limited range of credit quality of local bond markets, and the need for further development of infrastructure bond markets in the region. Sections 5-7 cover the extent of post-trade transparency and the development of hedging and repo markets. Section 8 presents conclusions.

## 2. Progress in corporate bond markets

The ABF2 has been one of two major initiatives in the region to enhance the local currency bond markets (see EMEAP, 2006). The other initiative has been the Asian Bond Market Initiative (ABMI) under the auspices of the ASEAN+3 governments;<sup>3</sup> in 2005, the finance ministers of these governments met in Madrid and launched a roadmap for developing local currency bond markets. The roadmap focused on four areas: (a) promoting issuance of local-currency bonds; (b) fostering demand for these bonds; (c) improving the regulatory framework; and (d) enhancing market infrastructure.

While the ABF2 initiative focused clearly on just government and quasi-government bonds, the ABMI roadmap of 2005 did not distinguish between government bonds and corporate bonds. But given the much smaller size of corporate versus government bond markets at the time, the ASEAN+3 focused largely on issues related to government bonds. It was suggested that, given complementarities between markets, the maturation of government bond markets would over time also accelerate corporate bond market development. For example, generating a reliable benchmark yield curve in government bonds would facilitate pricing in corporate bonds.

The closest the ASEAN+3 governments have come to directly promoting corporate bonds has been to encourage issuance by state-owned firms, including financial institutions, and to set up the Credit Guarantee and Investment Facility (CGIF). Siackhachanh (2012) points out that fostering issuance by state-owned firms resulted in Chinese policy banks' accounting for 31% of China's outstanding local currency bonds in 2011. For its part, the CGIF started operations in 2012, with authorized capital of USD700 million and with the ADB as trustee. By 2014, the facility had issued guarantees amounting to a total of USD740 million. While the guarantees make the corporate bonds more like government bonds in terms of credit quality, they do not necessarily foster the assessment and pricing of credit risk by the market.

In the 2011 report, Chan, Chui, Packer and Remolona concluded that at least in the larger ASEAN countries – Indonesia, Malaysia, the Philippine, Singapore and Thailand – the government bond markets had already achieved sufficient depth and liquidity to be able to play their appropriate economic roles. These markets already

<sup>3</sup> <https://asianbondsonline.adb.org/about.php>

allowed reasonably efficient market-based financing of government deficits and already provided benchmark yield curves. These developments, however, had not appeared to spark active secondary markets for corporate bonds.

## Size of local-currency debt markets in EMEAP economies

Amount of debt securities outstanding as a percentage of nominal GDP

Table 1

	2005			2010			June 2015		
	Corp	Govt	Total	Corp	Govt	Total	Corp	Govt	Total
<b>ABF2 economies:</b>									
China	3	36	39	10	39	50	19	34	53
Hong Kong	38	9	47	33	38	72	29	36	65
Indonesia	2	16	18	2	12	14	2	13	15
Korea	40	43	83	58	44	102	76	53	129
Malaysia	31	41	72	38	54	92	41	54	95
Philippines	1	39	39	4	31	36	6	30	36
Singapore	28	37	65	26	41	67	32	50	82
Thailand	8	35	43	12	51	63	17	55	72
<b>Other EMEAP economies:</b>									
Australia	52	13	65	60	26	86	60	43	103
Japan	17	147	165	19	178	197	16	205	221
New Zealand	8	20	28	20	26	47	28	26	54
<b>Reference:</b>									
United States	35	55	90	44	84	128	46	93	139

For China, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore and Thailand, data are from AsianBondsOnline where local debt securities are defined as local currency bonds. Government bonds include obligations of the central government, local governments, and the central bank. Corporates comprise both public and private companies, including financial institutions. Financial institutions comprise both private and public sector banks, and other financial institutions.

For Australia, data are from the BIS domestic debt securities statistics. Corporate debt securities refer to the sum of debt securities issued by financial corporations and non-financial corporations. Government debt securities are securities issued by the general government. These domestic debt securities may include foreign-currency debt securities.

For New Zealand, amounts of corporate debt securities are provided by the Reserve Bank of New Zealand. Corporate debt securities include debt securities issued by resident financial institutions, resident non-financial corporates and those issued onshore by non-residents. Government debt securities are from the BIS domestic debt securities statistics and refer to debt securities issued by the general government which may include foreign-currency debt securities.

For United States, outstanding debt securities include both local and foreign currencies.

Sources: AsianBondsOnline; Reserve Bank of New Zealand; sifma; BIS domestic debt securities statistics; BIS calculations.

Since the last report, the size of the corporate bond markets has significantly increased, as issuance of local currency corporate bonds has surged in the eight ABF2 economies. In absolute dollar amounts, Chinese and South Korean markets are the largest: by June 2015, China had close to USD2 trillion in outstanding local currency corporate bonds and South Korea over USD1 trillion. As shown in Table 1, such corporate bonds in South Korea amounted to 76% of GDP in 2015, a proportion that is larger than even that of the United States. Local currency corporate bonds in Malaysia stood at 41% of GDP, in Singapore 32% and in Hong Kong 29%. These proportions suggest markets that are reasonably well developed, and interviews with market participants suggest that indeed South Korea, Malaysia, Singapore and Hong Kong can now be considered to have relatively well developed primary corporate bond markets. Though the proportions in China and Thailand are relatively small at

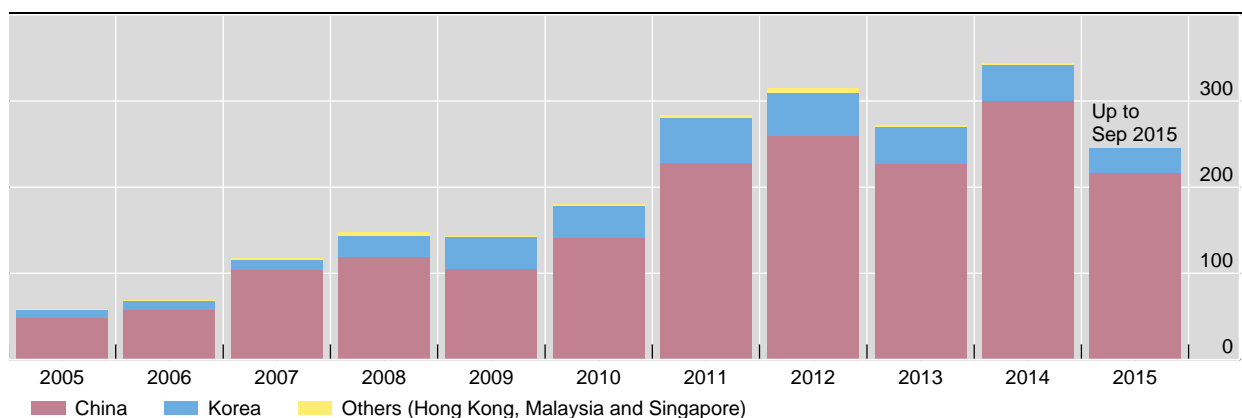
19 and 17%, they are significantly higher than the 10 and 12% scored in 2010, respectively.<sup>4</sup> The proportions remain much smaller in Indonesia and the Philippines. Among the other EMEAP (non-ABF2) economies, the size of the local-currency bonds markets remains stable relative to GDP in Australia and Japan, while it has grown to 28% (from 20%) in New Zealand.

When it comes to the largest (and most liquid) local currency corporate issues in the ABF2 economies, the bonds have tended to come from more sizeable markets. Graph 1 shows the issuance over time of bonds that have been large enough for their names to be included in the iTraxx Asia ex-Japan index of CDS contracts. The index at present includes names of 34 companies, more than one-third of which are in Korea, although there are also a few in China, Hong Kong, Malaysia and Singapore. Here we see that relative to 2010 – the last year reviewed in the previous report – corporate bond issuance among the large issuers is up significantly. Issuance for 2015 is only partial, but it is highly likely that when it is extrapolated out to the end of the year, it will be close to or over earlier annual highs. The largest issuers are those from China and Korea.

### Corporate local-currency bond issuance by iTraxx Asia ex-Japan constituents in ABF2 economies<sup>1</sup>

In billions of US dollars

Graph 1



<sup>1</sup> Up to 30 September 2015. Sample consists of 29 companies which are from the ABF2 economies and are members of the iTraxx Asia ex Japan Index (as at 30 September 2015). These 29 companies come from China, Hong Kong, Korea, Malaysia and Singapore. Exclude bonds issued outside of the ABF2 economies. For each company, local currency refers to currency of the country where the parent company operates. Sources: Bloomberg; Dealogic; BIS calculations.

The average issue size is one indicator of the depth of the primary market. Table 2 reports ranges for the issuance size in both government and corporate markets in ABF2 jurisdictions. As expected, the issue size is much larger for governments than corporates, by a factor of between 2 to 8 times in most jurisdictions (although for Korea, government issues are around 20 times larger than corporate issues). When the issue size is relatively large, the same jurisdiction's corporate market average issue size tends to be large as well, though the relationship is not one-for-one. China's government bond issuance tends to be between \$2.4-\$4.8 bn, and corporate bond

<sup>4</sup> In Thailand, the SEC's move in 2012 to relax a credit rating requirement and allow the sale of non-rated bonds to those qualified as accredited investors contributed to this growth.

issue size is also largest among the EMEAP countries at \$0.1-\$1.6 bn. Singapore and Korea have the next largest issue size for governments, but among corporate bonds, issues from Malaysia at \$0.07 to \$3.8 bn are the second largest.<sup>5</sup>

Average bond issuance size in ABF2 economies			Table 2
	Government <sup>1</sup> (USD billion)	Corporate <sup>1</sup> (USD billion)	Factor <sup>2</sup>
China	2.42–4.83	0.08–1.61	4.3
Hong Kong	0.19–0.45	0.01–0.13	4.5
Indonesia	0.08–0.24	0.04–0.08	2.7
Korea	0.92–1.83	0.05–0.09	20.0
Malaysia	0.43–1.29	0.07–0.57	2.7
Philippines	0.56	0.138	4.1
Singapore	1.13–2.26	0.08–0.38	7.5
Thailand	0.24–0.61	0.03–0.30	2.5

<sup>1</sup> 2014 data. All data are from the HSBC, except for the figure for corporate bonds of the Philippines which is from AsianBondsOnline ("typical issue size"). <sup>2</sup> Calculated as the mid-point of average issuance range of government bonds divided by the mid-point of average issuance range of corporate bonds.

Sources: AsianBondsOnline; HSBC (2015); BIS calculations.

### 3. Expanding the range of credit quality

One aspect in which corporate bond markets have not developed greatly in emerging Asia is in the range of credit quality available to investors.<sup>6</sup> A wider range of investment choices would both enhance market depth, in addition to providing an alternative to bank financing for less than pristine credits. Table 3 reports the credit quality for companies – as measured by the rating on their foreign currency obligations from Standard and Poor's – in the ABF2 region for which credit default swaps are available. Partly reflecting the improvement in the rating of the sovereign, the (weighted) average rating of foreign currency corporate bond issuance has increased noticeably in China, by four notches. In Hong Kong and Singapore, the ratings have also improved. In the case of Korea and Malaysia, corporate bonds with ratings that are either identical or close to the sovereign are likely viewed as reflecting quasi-sovereign risk (Table 3). Meanwhile, the corporations of one lower rated

<sup>5</sup> The above analysis focuses on the mid-point when assessing average size, but another indicator of depth is the range of issue sizes; for corporate bonds, the size of the range tends to correspond to the size of mid-point in Table 2 for corporate bonds, eg China and Malaysia have the largest mid-point as well as the widest range of corporate bond issuance sizes.

<sup>6</sup> To be sure, initiatives such as the Credit Guarantee and Investment Facility (CGIF) of the ABMI help make it possible for lower grade corporates to access bond markets. For instance, in Australia, BBB issuers have used credit enhancements to issue in Australian dollar markets (Black and Munro, 2010). But providing third party enhancements to credits so that they can be treated by investors as high grade credits is not the same as building the capacity among investors and asset managers to invest in lower-grade credits. The lack of development of private sector issuance in emerging markets and the existence of unexploited potential benefits for pricing of risk along the credit spectrum was also noted in CGFS (2007) and Turner (2012).

country, Thailand, no longer have credit default swaps in the iTraax Asia ex Japan CDS index; and there continue to be no CDS in the index on corporates of the two remaining ABF2 jurisdictions (Indonesia and the Philippines).

Sovereign and selected corporate credit ratings of iTraxx Asia ex-Japan issuers

Table 3

	Average long-term foreign currency sovereign rating <sup>1</sup>		Weighted average rating on foreign currency corporate bond issuance <sup>2</sup>	
	2005–2010	2010–2015	2005–2010 <sup>3</sup>	2010–2015 <sup>4</sup>
China	A	AA–	BBB–	A
Hong Kong	AA	AAA	BBB+	A–
Korea	A	A+	A	A
Malaysia	A–	A–	A–	A–
Singapore	AAA	AAA	A–	AA–
Indonesia	BB–	BB+	...	...
Philippines	BB–	BB+	...	...
Thailand	BBB+	BBB+	A–	...

<sup>1</sup> Calculated based on Standard & Poor's rating on foreign currency long term debt, with score assigned to each notch. <sup>2</sup> Calculated using foreign-currency corporate bonds with issuer rating by Standard & Poor's at launch, weighted by amounts issued, with score assigned to each notch. <sup>3</sup> Sample consists of 52 (39 investment grade and 13 high yield) companies in the iTraxx Asia ex Japan CDS index, as of August 2010. Sample covers the period January 2005–August 2010. For details, see BIS (2011), "Local currency bond markets and the Asian Bond Fund 2 Initiative". <sup>4</sup> Sample consists of 29 companies which are from the ABF2 economies and are members of the iTraxx Asia ex Japan Index (as at 30 September 2015). These 29 companies come from China, Hong Kong, Korea, Malaysia and Singapore. Exclude bonds issued outside of the ABF2 economies. For each company, local currency refers to currency of the country where the parent company operates; other currencies are foreign currencies. In 2010–2015, the Malaysian companies in the sample did not issue any foreign currency bond in the ABF2 economies. Hence, the weighted average rating on foreign currency corporate bond issuance for Malaysia is proxied by the issuer rating of a Malaysian company in the sample. Sample covers the period January 2010–September 2015.

Sources: Bloomberg; Dealogic; BIS calculations.

The above-mentioned table confirms a shortcoming of corporate bond markets in the region: there is not a great diversity in credit quality; existing credit markets for major credits do not cover the entire credit curve.<sup>7</sup> The point shows up even more clearly when examining the distribution of local agency ratings for corporate bonds issued in the region. In Table 4, we utilize all observed corporate bonds issued in each economy from 2010–2015 with a rating from the major local rating agency. In general, these ratings are for issuers that wish to access the local market, often different entities than those issuing in the off-shore markets. The distribution of local agency ratings in emerging Asia tend to be higher than global agency ratings, in part because sovereign ratings generally cap the foreign currency ratings of the major global agencies for corporations in the jurisdiction. Local currency investors then get the possibility of greater granularity in local agency ratings which can usually range up to AAA for the sovereign. In addition, a much larger sample of companies generally require local currency ratings for the purpose of accessing the local markets than

<sup>7</sup> The more granular distribution of ratings also illustrates this point, with the 10th and 90th percentiles of the sample (S&P) ratings for China, Korea and Singapore coming in at A-/A+; A-/A+ and AA-/AA-, respectively. Thus even the 10th percentile was only two notches below the 90th percentile at most. An exception to this pattern among the sampled jurisdictions is Hong Kong, where the even the 25th percentile is rated BBB-, a full four ratings notches below the 90th percentile rating of A. The global ratings scales of the major agencies are generally not comparable to local agency scales in EM Asia and the range of credit quality available from local issuers should be assessed by looking at the two ratings sets separately, as we do here.

those that require global agency ratings for the purpose of issuing in offshore markets.

But for the most part, issuers and investors don't take full advantage of the wider range of credit risks offered by local currency ratings (Table 4). In China and the Philippines, effectively all local currency corporate bond issuance is rated either AAA or AA by the main local rating agency. In Indonesia, Korea and Malaysia, the share in the AAA/AA category ranges between two-thirds and nine-tenths, with lion's share of the remainder of issues at A. Only in Thailand does the distribution of ratings spans the entire spectrum of investment grade ratings, with A and BBB-rated issues garnering more than fourth-fifths (three-fifths of which is A-rated). At the same time, however, even Thailand has less than 1% at non-investment grade ratings<sup>8</sup>, and Korea tops the proportion of non-investment grade issuers at around 2%.

### Credit ratings by local rating agencies for local-currency corporate bonds<sup>1</sup>

As a percentage of number of local-currency corporate bonds issued, 2010–Q3 2015

Table 4

	AAA to AA	A	BBB	Below BBB	Unrated/Withdrawn
China	99.9	0.0	0.0	0.1	0.0
Indonesia	65.8	28.8	3.9	0.8	0.8
Korea	80.9	13.0	2.9	2.1	1.0
Malaysia	88.9	8.9	1.0	0.8	0.3
Philippines	100.0	0.0	0.0	0.0	0.0
Thailand	16.7	62.9	18.2	0.9	1.3

*References:*

#### Other emerging market economies

India	82.8	10.6	2.9	3.4	0.3
Russia	31.8	13.6	9.1	45.5	0.0
South Africa	42.1	57.9	0.0	0.0	0.0

#### Advanced economies

Japan	59.0	34.1	6.8	0.1	0.0
United States (Q1 2015) <sup>2</sup>	4.7	16.1	23.5	55.7	N/A
Europe (Q1 2015) <sup>2</sup>	6.9	26.8	24.3	42.0	N/A

<sup>1</sup> Latest issue ratings. Exclude issuers categorised as "Banks" by Bloomberg, bonds which were issued by development banks and bonds without credit rating data available from Bloomberg. Bonds classified as unrated/withdrawn are those explicitly assigned "Unrated" or "Withdrawn" by credit rating agencies. Local credit rating agencies: Dagong Global Credit Rating for China, PEFINDO for Indonesia, NICE Group for Korea, PhilRating for the Philippines, MARC or RAM rating for Malaysia, TRIS Rating for Thailand, CARE rating for India, Expert RA rating for Russia, Global Credit Rating for South Africa, and R&I rating for Japan. For comparison purpose, the ratings by these rating agencies have been harmonised to compile the table above. <sup>2</sup> Issuer ratings by Standard & Poor's. Bonds issued by all industries and issued in all currencies in the first quarter of 2015.

Sources: Bloomberg; Standard & Poor's; BIS calculations.

While an argument can be made that lower credit quality issuers are well serviced by a well-developed banking sector in many jurisdictions of the Asia-Pacific, having

<sup>8</sup> Between 2010-2015, there were five Thai bonds issued with a TRIS rating less than BBB.

readily available alternative sources of financing should lower borrowing costs and increase investment opportunities.<sup>9</sup>

There are also few signs, if any, of widening in the range of credit risks over time. The above mentioned percentages are based on the aggregate of issuance over the nearly six year period 2010-2015. If the periods are divided into 2010-2012 and 2013-2015, there is little indication that the range of credit quality has expanded; in fact, quite the reverse. There is a greater percentage of AAA to AA issuance in the later period for four of the six economies, and a fifth, the Philippines, stayed unchanged at 100%.

The reference cases of other (non-EMEAP) emerging market economies demonstrate some local rating agencies with a broader range of ratings (Table 4). Russia and South Africa have around 60-70% of issues rated A or below. (In India however, the range of ratings is more similar to those of the EMEAP EM jurisdictions, with more than four-fifth of the entities rated in the AAA or AA range.)

The cases of the United States and the euro area show an even more striking contrast (Table 4, last two rows). Here by number of issues, well more than 50% of all US issues and 40% of all European issues are rated lower than investment grade by Standard and Poor's. Both regions also have around one-quarter of issues at the lowest investment grade rating of BBB. On the other, in the US only 4.7% of issues are rated AAA or AA; the euro area records an only slightly greater fraction of 7%. Japan provides a striking contrast among the sampled advanced economies, with no non-investment grade corporate bond market to speak of and around 60% (90%) rated AA (A) and above.

What is it about the United States and the euro area that has resulted in such a wide range of credit quality at issuance, and in particular at non-investment grade ratings? The US case is unique, since the development of the bond market and waves of defaults long preceded the creation of bond rating agencies, and credit ratings below BBB were quite common from the inception of rating agencies more than a century ago. The expansion of the range of credit quality in the European market is of much more recent vintage as high yield issuance in Europe outside of the UK was virtually unheard of in the early 1990s. One of the major determinants was clearly currency unification, which allowed bond issuers to achieve significant economies of scale in bond issuance. Thus, one of the benefits of market integration in Europe was to facilitate below-investment-grade issuance.<sup>10</sup>

<sup>9</sup> This is not to suggest that bonds should displace bank loans altogether; in fact, borrowing from banks allows firms to build enough of a reputation to access the bond markets (Hale and Santos, 2008); further banks play a complementary role to bond markets for many firms, as the evidence suggests that the two use different technologies when monitoring borrowers (Berlin, 2012). The synergies between the development of local capital markets and an efficient local banking industry were emphasized in BIS (2014). In one EMEAP jurisdiction of the region (not included in Table 4), the unrated proportion comprises 60% of outstanding volume, reflecting both high credit quality issuers with ample liquidity and no need to obtain a credit rating and lower credit quality, high yield issuers. In this jurisdiction, credit ratings requirements or floors for institutional investors do not appear to be a constraint for issuers, which distinguishes it from most other EMEAP jurisdictions.

<sup>10</sup> In the United States, bond markets and waves of defaults preceded the creation of the credit rating industry. When the credit ratings were first assigned, there were many that had ratings below BBB, which only later became viewed as a rating for regulatory cut-off. For discussion of the history of the credit rating industry in the US, see Sylla (2002), and Flandreau et al (2011). For the renewed surge of high-yields in the late 1970s and early 1980s, see Taggart (1987). For the discussion of the growth of



What more can be done to encourage a wider spectrum of credit quality in issuance in Asia? One member jurisdiction has noted that streamlining documentary requirements could encourage more corporate bond issuance, even from companies with lower credit ratings. Given the prominent role of institutional investors in Asia, lowering or removing the credit rating floors of institutional investors could also help. Many economies throughout the world still have many regulations and investment guidelines that key off ratings, despite the best efforts of the Financial Stability Board to encourage jurisdictions to wean their regulators, supervisors and investors off of excessive dependence on credit ratings (FSB, 2014). Ratings below common regulatory cut-off levels such as investment-grade (BBB and above) can be useful for financial market development, as suggested by the U.S. case.

In fact, central banks themselves are often constrained in the securities they can invest in through internal guidelines. Anecdotal evidence suggests that in the region, the degree to which reserve managers can invest in corporate bonds as well as different rating classes differs quite a bit across central banks. Constraints on the admissible collateral for central banks' domestic markets operations might perhaps also be worthy of review from a financial market development perspective. By expanding the range of eligible securities for investment and admissible collateral, both in terms of rating class and asset type, the EMEAP central banks could provide a demonstration effect for financial markets more generally.<sup>11</sup> (Facilitating issuance in offshore foreign currency markets more amenable to lower grade investments will also be helpful, as will be discussed in section 6.) The next section of this report discusses a burgeoning asset class – infrastructure bonds – that may offer good candidates for expanding the range of credits that EMEAP CBs can invest in.

## 4. Introducing infrastructure bonds

The infrastructure needs of the ABF2 economies are vast, and various observers have suggested that a well-functioning corporate bond market would help finance those needs.<sup>12</sup> Indeed such a market would allow financing through the issuance of infrastructure bonds. These bonds offer certain advantages over bank financing. They can offer maturities that match the time profile of a project's cash flows, something that would be difficult to do with bank financing. They would also tap a new investor base. In a less developed corporate bond market, the issuance of infrastructure bonds can pose formidable challenges. If these challenges can be surmounted, however, such bonds can go a long way in furthering the development of the corporate bond market. Infrastructure bonds can help diversify the market, particularly by widening the range of credit quality that the market gets to price and to trade. Rather than just

the European high yield market, see Alliance Bernstein (2014). For a general discussion of bond markets in emerging markets, and why markets for lower rated debt securities remain undeveloped in most EMEs, see IOSCO (2002)

<sup>11</sup> Indeed, influencing the behaviour of private fund managers in the region was one of the motivations behind the establishment of the Asian Bond Funds (Chan et al, 2005). At the same time, some central banks undoubtedly have internal constraints that might make it difficult to purchase risky assets: the relevant question might be whether the informational and political constraints are such that even amounts extremely small relative to the overall portfolio should indefinitely be off limits.

<sup>12</sup> See, for example, Ehlers, Packer and Remolona (2014).

wait for the market to develop, it may be possible to give it an extra push by introducing infrastructure bonds.

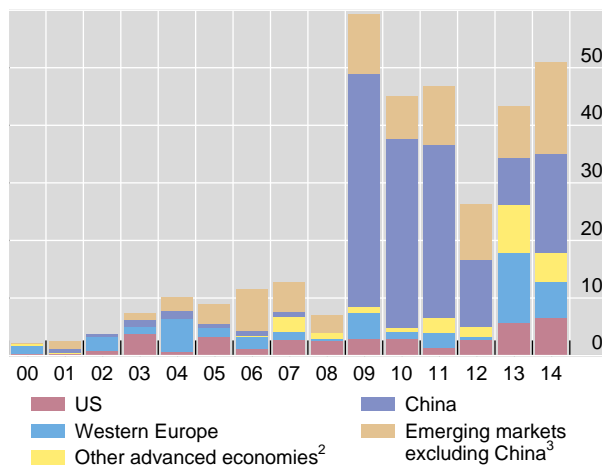
The good news is that since 2009, emerging market economies have dominated the issuance of infrastructure bonds. As shown in the left panel of Graph 2, issuance of these bonds from 2009 to 2014 by emerging markets has amounted to \$203.5 billion, three times as much as what was issued by advanced economies. China alone accounted for \$140 billion, possibly driven by the effort to stimulate the economy in the wake of the global financial crisis. The right panel of Graph 3 shows how remarkable was China's reliance on bond financing. Only for China do we find bonds exceeding syndicated loans in the financing of infrastructure.

## The global market for infrastructure bonds<sup>1</sup>

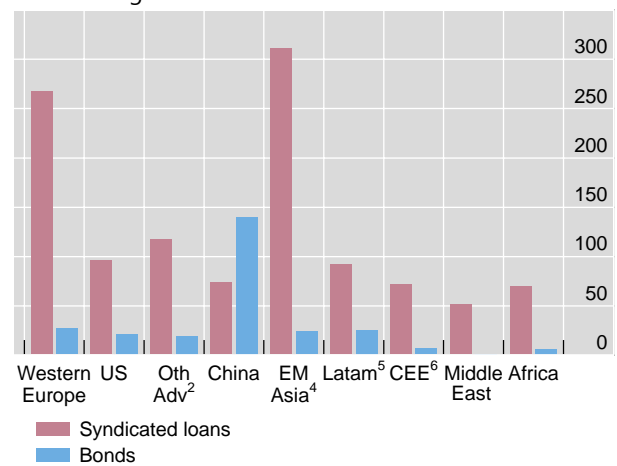
In billions of US dollars

Graph 2

Global issuance of infrastructure bonds



Infrastructure bonds versus syndicated loans  
Selected regions 2009–2014



<sup>1</sup> Infrastructure bonds are defined as project bonds by issuers from infrastructure-related industries. <sup>2</sup> Australia, Canada, Japan and New Zealand. <sup>3</sup> Emerging Asia, Central and Eastern Europe, Middle East and Africa. <sup>4</sup> EM Asia = emerging Asia excluding China. <sup>5</sup> Latin America. <sup>6</sup> Central and Eastern Europe.

Source: Bloomberg; Dealogic; BIS calculations.

The bad news is that most of these bonds have been limited to only one type of infrastructure bonds, and it is not the type that contributes best to deepening a corporate bond market. It is important to distinguish between two broad types of infrastructure bonds. The first type are bonds issued by infrastructure-related companies for general corporate purposes. In this case, the bond's credit rating would depend on the risk of the company, not the risk of specific projects. The second type would be bonds that are tied to specific infrastructure projects. These bonds may also be issued by infrastructure-related companies but with repayment risks tied to the cash flows of stand-alone infrastructure projects. Increasingly, such bonds are issued by special purpose vehicles (SPVs) or by holding companies for several SPVs. These SPVs are structured so that the assignment of risks and rewards to different investors provide desirable incentive mechanisms. These SPVs are often sponsored by public-private partnerships (PPPs) that are established for the specific purpose of constructing and operating infrastructure projects. In this case, the bond's credit rating would be intrinsic to the project and the structure of the SPV. This structure could include some credit enhancement from a government agency or multilateral organization, but this would not protect the investor entirely from much of the

project's risk. In Asia, credit enhancements are often provided by export-import banks.

In emerging Asia, project-specific bonds appear to be exceedingly rare. Most infrastructure bonds in the region are those issued by infrastructure-related companies for general corporate purposes. The Asian Development Bank (2015) estimates that about 18.5% of corporate bonds outstanding in six countries in the region are infrastructure bonds, and virtually all of them are bonds issued by infrastructure-related companies.<sup>13</sup> In China, for example, the largest infrastructure bonds all seem to be of this type. As shown in Table 5, six infrastructure bond issuers are among the 30 largest corporate issuers in China. All six are state-owned infrastructure companies rather than infrastructure SPVs. The credit risks of the bonds would be closely related to China's sovereign risk rather than to risks related to stand-alone infrastructure projects. This means China's corporate bond market would still gain from the diversification benefits of a market that included bonds issued by infrastructure SPVs or other bonds tied to specific projects.

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### Infrastructure-related issuers among top 30 corporate issuers

30 June 2015

Table 5

	Amount (USD billion)	State Owned?
China Railway	182.8	Yes
State Grid Corporation of China	72.7	Yes
China Power Investment	19.6	Yes
China Three Gorges Project	12.3	Yes
China Southern Power Grid	12.1	Yes
China Guodian	11.8	Yes
<b>Total</b>	<b>311.3</b>	

Source: Based on data from AsianBondsOnline.

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To find examples of project-specific bonds, we can turn to Europe, which has evidently succeeded in developing a deep and liquid infrastructure bond market. Table 6 lists nine bonds that were issued to finance specific projects, six of which are for greenfield projects and three of which for brownfield projects. For bond investors, the greenfield projects are more challenging to finance, because the deal would include the construction phase, which tends to be fraught with risk. The brownfield projects are more straightforward, because these are deals for which the physical infrastructure is already in place and cash flows can already be expected to start coming in. Five of the issuers are SPVs. The other four are infrastructure-related companies that issued bonds that are tied to specific projects.

The advantage of infrastructure bonds issued through an SPV structure is that they can offer a highly desirable incentive mechanism. Indeed such arrangements have become the name of the game in modern infrastructure finance. Gone are the days when a triple-A rated bank or a monoline bond insurance company provided "wrapped" guarantees for bonds that financed infrastructure projects. The private-sector participation in a PPP utilizes incentive mechanisms to enhance an

<sup>13</sup> The six are Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam. Of these, Malaysia alone accounts for about 40% of total corporate bonds and 50% of infrastructure bonds.

infrastructure project in its various phases. In large part, these mechanisms allocate risks and rewards via the contractual structure of an SPV.

Examples of project-specific bond financing in Europe

Table 6

Issuer	Amount (million)	Maturity	Issue rating	Type of project
<b>Greenfield projects</b>				
Via A11 NV (SPV)	EUR 558	31 years	A3	Road construction, operation and maintenance
UPP Bond 1 Issuer plc (SPV)	GBP 382	27 years	Baa1 / A-	University accommodations
Merseylink plc (SPV)	GBP 257.2	29 years	Aa1	Toll bridge construction, operation and maintenance
Scot Roads Partnership Finance Ltd (SPV)	GBP 175.5	31 years	A-	Road construction and operation
FHW Dalmore (Salford Pendleton Housing) plc	GBP 82.6	29 years	None	Social housing refurbishment and management
Holyrood Student Accommodation plc	GBP 63	35 years	A2 / AA-	Student accommodation
<b>Brownfield projects</b>				
Autoroutes Paris-Rhin-Rhône	EUR 500	6 years	BBB+	Toll roads
Ineos Grangemouth plc	EUR 285	5 years	Aa1	Transformation of a petrochemical site
FCT France Broadband infrastructures (SPVs)	EUR 189	11 years	Baa2	Broadband network services

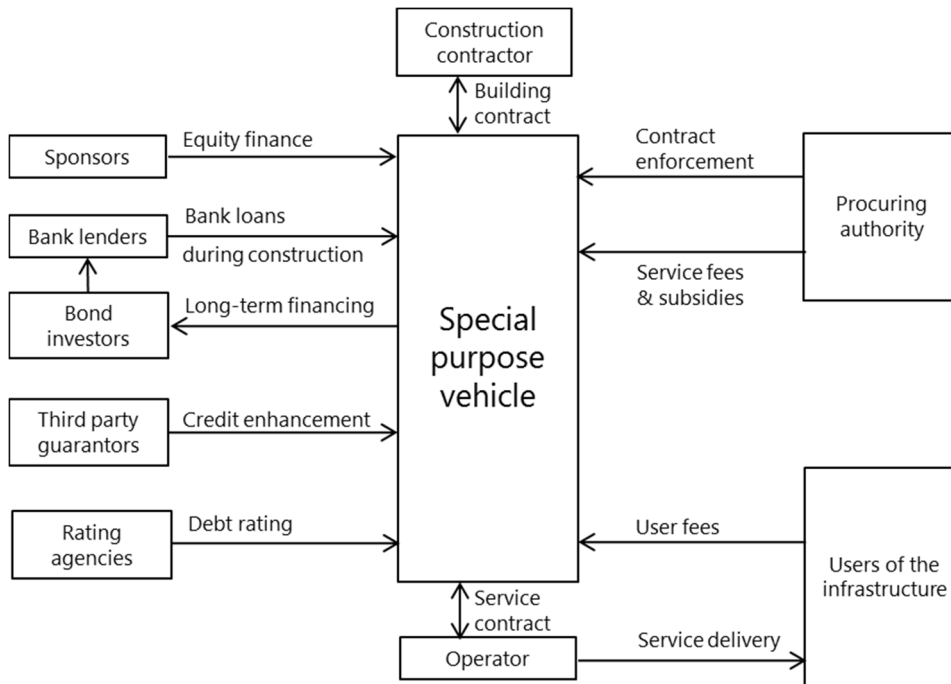
Sources: Association for Financial Markets in Europe and International Capital Market Association (2015); Bloomberg.

The disadvantage of infrastructure bonds issued through an SPV is that the contractual structure can be quite complex. An illustration of such a structure is shown in Graph 3. When it comes to financing, bank loans would finance the construction phase of the project, because banks have a comparative advantage in managing the short-term risks of this phase. Once the infrastructure is in place, long-term bond financing can then replace short-term bank financing. This may be accompanied by a third-party credit enhancement that offers bond investors protection against certain non-commercial risks, such as regulatory risk. As explained by Ehlers, Packer and Remolona (2014), in Asia, the typical third party for this credit enhancement has been a country's export-import bank. Unlike the traditional full sovereign or monoline guarantee, this protection would still leave investors exposed to commercial risks, which they would be in a reasonable position to bear and for which they would be adequately compensated.

The complexity of an appropriate SPV structure has led a shortage of bankable projects. Assembling this structure requires highly specialized skills on the part of the sponsors, and similar skills are required of potential investors. However, once there is a sufficient pipeline of bankable projects, institutional investors would be willing to develop the specialized skills required.

To help provide the specialized skills for PPP projects, various EMEAP governments have set up PPP centers that provide advice to potential sponsors. Australia has its Infrastructure Australia, China its Public-Private Partnerships Center, Indonesia its PPP Directorate of Bappenas, Japan its PPP Portal, Malaysia its PPP Unit, the Philippines its PPP Center and Korea its PPP Investment Management Center. In addition, the Singapore government is working with the World Bank to promote the

adoption of standard contractual provisions in regional PPP projects. As recommended by the World Bank Group (2015), these standards include provisions dealing with natural disasters, adverse government regulations, changes in law, refinancing and dispute resolution.



Source: Based on Engel et al (2010) and modified.

To encourage the issuance of project-specific bonds in EMEAP local currency bond markets, a possible initiative for the EMEAP Working Group on Financial Markets would be to establish and announce pre-eligibility criteria for project-specific bonds in which it would be willing to invest. One of these criteria, for example, could be that the project should be a brownfield one, because this would be less risky than greenfield projects. This initiative could complement what the MAS is doing in this area. The MAS is currently exploring the possibility of setting up an infrastructure debt takeout facility, which would allow banks to refinance infrastructure loans and institutional investors to finance brownfield projects.

## 5. Secondary markets: Post-trade transparency helps liquidity

In the past few sections, we have reviewed developments in the primary markets for corporate bond markets in the region. And yet, liquidity in secondary markets is an equally important aspect of bond market development. Liquidity affects the cost and timeliness with which corporations can raise funds, as well as the degree to which market prices reflect the credit risk across securities in a stable and consistent fashion.

Bid-ask spreads are a commonly used metric of bond market liquidity. Although these spreads were not reported in the 2011 report, recent estimates by a private bank of the range for bid-ask spreads for corporate bonds in the region suggest that not only do they remain well above those of government bonds in the corresponding jurisdiction, but for most jurisdictions, they have not declined since the time of a BIS study of 10 years ago (Table 7). The upper band of the bid-ask spreads for China, Hong Kong and Singapore appear to have increased significantly, while the lower end of the range remains unchanged for two, risen for another. Bid-ask spreads for Malay and Thai corporate bonds remain at 5-10 basis points. The one case of slightly narrowing spreads is that of Korean corporate bonds, which are easily the most liquid in the region; the range of bid-ask spreads is now 2-4 basis points relative to a 2-5 basis points range reported in 2005.

Bid-ask spreads in ABF2 bond markets in basis points

Table 7

	Government	Corporate	
	2014 <sup>1</sup>	2014 <sup>1</sup>	2014 <sup>1</sup>
China	2–3 bps	5–20 bps	5–10 bps
Hong Kong	10 bps	10–30 bps	10–15 bps
Indonesia	5–15 bps	50–200 cents (quoted in price)	
Korea	0.5–1 bp	2–4 bps	2–5 bps
Malaysia	2–4 bps	5–10 bps	5–10 bps
Philippines	5–15 bps	17 bps	
Singapore	3 bps	15–25 bps	10–15 bps
Thailand	1–6 bps	5–10 bps	5–10 bps

<sup>1</sup> Figure for Philippines corporate bonds from AsianBondsOnline, others from HSBC (2015).

Sources: AsianBondsOnline; HSBC (2015); Gyntelberg, Ma and Remolona (2005).

Bid-ask spreads reflect the costs of market making. These costs will depend on the asset that is being traded and the degree of transparency in the trading of that asset. The term "transparency" as applied to security markets refers to the amount and timeliness of the information provided to the investing public regarding prices and quantities. "Pre-trade transparency" refers to the dissemination of quotations or other indications of trading interest before the trades take place, while "post-trade transparency" refers to dissemination of information such as price and volume for completed trades.

Transparency varies across different financial securities and different trading venues. Trades in stock exchanges are among the most transparent ones. Pre-trade bid and ask quotes and post-trade transaction prices and trading volume are reported. The information is disseminated without delay in real-time and is accessible for free to all types of current or potential investors. By contrast, securities that are traded over-the-counter (OTC) have traditionally been more opaque. The OTC market is often characterized by private bilateral negotiations and no public reporting of transaction details. Information on quotes before the trade is often considered to be the proprietary information of dealers and investors. Thus, an investor needs to involve a dealer or a vendor to get information on prices before a trade. In OTC

markets even information of price and volume of previous transaction may often not be easily accessible.

Equity securities seem to trade most actively on exchanges, while fixed-income securities trade most actively on OTC markets. It is telling that many jurisdictions require corporate bonds to be listed on stock exchanges, yet market participants still prefer to trade these bonds on OTC markets rather than on the exchange. Corporate bonds tend to be full of covenants and this makes them inherently less liquid than equities. The high degree of transparency imposed by exchanges seems not to allow dealers to recover the costs of market making in corporate bonds. Hence, market makers would naturally prefer the opaqueness of OTC markets. At the same time, the information that comes with trade transparency is a public good, and left to their own devices dealers in OTC markets will not provide enough of it. The role of regulation is to require some transparency while still allowing dealers to benefit from market making.

The US Securities and Exchange Commission started a major transparency initiative with the introduction of a new reporting system in 2002 – the Trade Reporting and Compliance Engine (TRACE)<sup>14</sup> (see Box A). After the crisis, many financial markets became subject to new regulations requiring transparency, as it became obvious that increased transparency could go a long way towards restoring investor confidence and public trust. Both in the US and Europe, there has been an active debate on revising the trade reporting design in the fashion most appropriate for their respective markets. The EU is currently discussing to expand the transparency rules introduced to equities in 2007 under Markets in Financial Instruments Directive (MiFID) to non-equities under MiFIDII (see Box B).<sup>15</sup>

While trade transparency can be positive for secondary market activity, there can be too much of it. The introduction of TRACE in the US corporate has provided a natural experiment on the effects of increasing transparent on secondary market activity. Although different studies use notably different sample and research designs, overall they conclude that the increased transparency associated with TRACE transaction reporting is associated with a substantial decline in *investors' trading costs* (see Box A). In general, the experience of OTC markets seems to suggest that the requirement of pre-trade transparency leads to a decline in liquidity, while the requirement of post-trade transparency has led to greater liquidity. At the same time, there are differences across asset classes which suggest authorities may wish to carefully design the transparency regime in order to strike the *right balance* between benefits and costs.

<sup>14</sup> Indeed, the introduction of TRACE in the US is seen as such a significant innovation that has been compared to the early 20th century introduction of stock market tickers and electronic screens for Treasuries (Vames, 2003).

<sup>15</sup> Even in the US, with its already highly evolved post-trade transparency regime, a discussion has begun on increasing the reporting frequency to real time given the increased importance of high frequency trading.

## The impact of the introduction of TRACE on US corporate bond markets

Increased transparency in market does lead to increased liquidity only when it is designed properly. The introduction of TRACE in 2002 in the US corporate market – which resulted in public reporting of transactions – is a rare example of a natural experiment and serves as the main reference point in the academic literature.

Bessembinder et al (2006) find that the trade execution costs for institutional trades fell by approximately 50% for bonds eligible for TRACE transaction reporting, and by 20% for bonds not yet eligible for TRACE reporting. The latter finding suggests a ‘liquidity externality’, whereby investors use price data for reported bonds to better estimate values for non-reported bonds. The studies of Edwards, Harris, and Piwowar (2007) and Goldstein, Hotchkiss, and Sirri (2007) covered all investor types and reported reductions in trading costs between 0.01 and 0.04 percent, Edwards et al (2007) estimated a higher saving when controlling for other variables of 0.03 to 0.06 percent, and found further that cost reduction was greatest for smaller trade sizes.

The competitive environment of the dealer market was also affected. Bessembinder et al (2006) report that the market share of the largest 12 dealers fell from 56% to 44%, suggesting that large dealers’ have less of an information advantage in a transparent market. Goldstein and Hotchkiss (2007) find that the difference in price dispersion of retail vs. institutional investors declined post-TRACE, suggesting individual and small money managers benefited the most from transparency.<sup>Ⓐ</sup> The flip-side of lower trading costs is lower dealer profit: Bessembinder et al (2006) and Edwards et al (2007) estimate that corporate bond dealers’ market-making revenue was reduced by around \$1 billion per year.

At the same time, the introduction of TRACE appears to have reduced some trading volumes (Acquith et al, 2013). Post-TRACE high-yield bonds saw the largest decline in trading activity, though they also saw the largest decline in the standard deviation of daily price quotes. The welfare impact of this combination of effects is not clear. However, it seems worthwhile to note, as put forward by Bessembinder et al (2008), that corporate bid trading activity overall showed a slight upward trend from \$17.9 billion USD per day in 2001 to \$22.7 billion dollars per day in 2006 based on data by the securities Industry and Financial Markets Association. The overall impact of trade transparency on volume in the longer-term is more difficult to judge.

Other hypothesized impacts of transparency are less well documented. Some worry that transparency means that dealers will be less willing to hold inventory (Gemmill, 1996). Others suggest that financial and human capital may shift out corporate bonds into alternative asset classes. Large investor of corporate bonds may be reluctant to trade in classes where they might reveal their investment strategy, and large trade might be particularly vulnerable.

The literature on the TRACE experience thus suggests that while transparency reduces trading costs, policymakers may wish to be mindful on the differential impact on different types of securities when shifting to a regime with greater transparency.

<sup>Ⓐ</sup> Biais and Green (2007) document that when US corporate bonds migrated from exchange to the less-transparent OTC markets in the early 1940s, the bond trading of institutional investors bond grew disproportionately.

Jurisdictions in Asia may have their own rationales for encouraging transparency in trading. Particularly in Asia, the market for corporate bonds tends to be dominated by large *institutional investors*, who trade large ticket sizes infrequently. There may be a greater role for government to ensure a *level playing field* for small and or non-local investors and trading service providers. At the same time, the markets are generally smaller and more heterogeneous than those in the US and Europe; transparency may gain in importance in encouraging less informed investors to participate given the different languages and legal frameworks.

Thus, it is perhaps not surprising that Asian jurisdictions are also making efforts to increase post-trade transparency (Table 8). In most ABF2 countries reporting is in fact now mandatory for all OTC trades. The exceptions are Hong Kong and Singapore: in Hong Kong, it is mandatory only for listed bonds traded off-market or unlisted



bonds traded on the ATS (Automated Trading Services); in Singapore it is mandatory only for government bonds. When reporting of corporate bond trades is mandatory, in most jurisdictions it is implemented through an electronic trading platform. The information at a minimum covers price, volume, trade and settlement date across jurisdictions; in the case of Thailand and Indonesia disclosure of the counterparty is also expected.

Box B

### Trading transparency in the EU corporate bond markets: the role of CTPs

The trading landscape and transparency in EU capital markets are about to shift. New disclosure and reporting requirements under the Markets in Financial Instruments Directive and regulation (MiFID II / MiFIR) aim to promote competition, transparency, financial stability and the orderly functioning of the markets. The key capital market reforms under MiFIDII include expanding the pre- and post-trade transparency regime – ie the scope of reporting of prices and trades – to include non-equity instruments like bonds, structured finance and derivatives. Under the new regime, transparency should increase significantly as the number of instruments covered will expand from about 6000 equities to 100'000s of financial instruments. In practice this will require making public the current bid and offer prices as well as the depth of trading interests in a wide range of instruments (see eg. Deloitte 2014).

One side effect of the MiFID's transparency rules for equity was increased fragmentation in EU equity markets. Industry and regulators have tried to ensure this would not be repeated in MiFIDII by introducing a regime whereby data reporting services providers would establish and run consolidated tape providers (CTPs). CTPs would aggregate post-trade data across markets from exchanges, other trading venues and approved publication arrangements and would be responsible for cleaning and normalizing data to the EC's uniform guidelines as to content, timing and costs. CTPs are also expected to decrease difficulties and costs for market players to prove best execution to their clients due to a lack of aggregated information in same format and timelines. Those costs have been increased with the rise in alternative trading venues over the past decade in Europe. As of now the EC envisages multiple competing CTPs. However, EC indicated it will select a single CTP if not enough providers offer to fulfil the role, including possibly appointing through a public procurement process. Until CTPs are up and running, issues with market fragmentation are likely to continue.

While details still need to be worked out, firms are expected to comply with the new rules by 2017. The reporting requirements currently under discussion foresee reporting the price, volume and time of transactions as close to real time as possible. Reporting may be deferred in certain circumstances.

The timing for the mandatory reporting of trades differs across jurisdictions. In China reporting for corporate bonds is required by the end of the day, in Thailand at 12 noon and 4pm. In the other EMEAP markets it is mostly within 15 minutes of the trade. In the case of Philippines, PDEX provides the information in real time to market participants and with a delay of 15 minutes to others. The biggest difference among the EMEAP markets is in methods of disseminating the trading data. In China the information is available through at least six sources Chinamoney, Shclearing, Chinabond, Wind, as well as the Stock Exchanges in Shenzhen and in Shanghai. All of them are available in English, but Wind is available only through subscription. Similarly in Indonesia, Korea, and Malaysia the stock exchanges provide the information for free while the respective pricing agencies do so only for subscribers.

## Arrangement of post trade transparency in ABF2 countries

Table 8

Jurisdiction	Reporting mandatory for OTC	PTT requirements for corp bond trades over platform	Coverage	Timing	Information dissemination (coverage); publicly availability
China	Yes. PBoC requires reporting of all transactions on the interbank bond market to the China Foreign Exchange Trade System (CFETS).	Yes (CFETS)	Price, volume, account and settlement type, delivery time.	At end of trading day	ChinaBond (Govt/Govt affiliated, banks, some corp bonds). Chinamoney (money market/bond market/derivative market data, limited English). Shanghai Stock Exchange (MTN, CP, corp bonds). Shenzhen Stock Exchange (MTN, CP, corp bonds). Shclearing (CP, SCP, MTN, SMECN, PPN, ABN, only Chinese). Wind ( <i>subscription only</i> ).
Hong Kong	No. Except for listed bonds traded off-market or unlisted bonds traded on ATS (Automated Trading Services).	Yes	Generally price and volume, however depends on nature of ATS.		CMU HKMA (Govt/Govt affiliated, banks, MTN, CP, corp bonds). Hong Kong Stock Exchange (Govt/Govt affiliated, MTN, CP, corp bonds). Information vendors (e.g. Bloomberg, Reuters) and ATS.
Indonesia	Yes.	No platform, but all OTC trades should be reported.	Price, Volume, settlement date, trade date, counterparty.		Indonesia Bond Pricing Agency <u>IBPA</u> ( <i>subscription only</i> ). Indonesia Stock Exchange <u>IDIX</u>
Korea	Yes. KSDA requires dealers to report all bond transactions (corporate and government bonds) to KOSCOM CHECK Terminal.	Yes. KOSCOM CHECK Terminal.		1999: 30 Min. Since 2004: 15 Minutes	Korea Exchange; Korea Bond Web ( <i>subscription only</i> ).
Malaysia	Yes.	Yes, Electronic Trading Platform (ETP)(previously BIDS).		Price and Volume; 10 Min.	Malaysia Bond Info Hub (near real time). Bloomberg and Reuters. Bond Pricing Agency Malaysia ( <i>subscription only</i> ).
Philippines	Yes	PDEX	Price, volume, trade date.	Real time market participants; 15 Min delay for others.	Philippine Dealing Exchange ( <u>PDEX</u> )
Singapore	Yes for Gov. No for corp bonds.	Yes for Gov. No for corp bonds.	Gov. NA Corp.	Real time.	Singapore Stock Exchange
Thailand	Yes	Thai BMA	Price, Volume, settlement date, trade date, counterparty (partly on aggregate not transaction basis).	Gov bonds: 45 Mins after the trade is concluded. Corp bonds and big lot transactions: 12nn and 4pm.	Thailand Bond Market Association ( <u>ThaiBMA</u> ), with some information disclosed only to ThaiBMA's subscribers.

Source: Standard Chartered Bank; national sources; authors.

Post-trade transparency is in many respects a public good, with less produced than is socially optimal due to divergent private interests and therefore worthy of government support.<sup>16</sup> As seen above, the different jurisdictions are taking measures to increase availability of price and volume data in its corporate bond markets and support a level playing field for all types of investors (Akamatsu, 2006). In each of the EMEAP markets the installment of its own state-of-the-art straight-through processes has been acknowledged – and in several markets for quite some time (eg Malaysia, Thailand, Korea, Philippines). However, despite the availability of an electronic trading platform that enables straight-through-processing (STP), most bond transactions are still executed through OTC market.

And yet, the transparency regimes in Asia are fragmented. While each of the ABF2 markets mandates a form of post-trade transparency, currently, the data for the ABF markets where provided are neither standardized nor accessible on a single access platform. Consolidated information on corporate bonds is not available in the EMEAP jurisdictions the way TRACE makes it available for trades of US corporate bonds, and MiFID proposes to do for European bonds. We argue that EMEAP could foster development of Asian corporate bond markets through the establishment of a regional post-trade transparency regime. Such a regime would require coordination and standardization of regulatory practice. Most of the technical pre-requirements for such a reporting platform are actually in place: given the existing straight-through-processes (STP) in each of the ABF2 markets, authorities are already collecting and disseminating the necessary information in one way or another.

To be sure, some large data providers consolidate much of the post trade data across markets and fill that gap. However, these providers are privately owned, are often headquartered outside EMEAP markets and do not necessarily provide this information as a public service. Thus, there may be a role for EMEAP in the *coordination and standardization* of the post-trade requirements most appropriate for Asian bond markets. Namely, EMEAP authorities could encourage the smooth running of consolidated tape providers (CTP; as they plan to do in Europe, see Box B). The data consolidation and dissemination could still remain with the external data vendors, though authorities could monitor and set standards for the provision and the pricing of this information.

## 6. Hedging instruments support on-shore development

Markets to hedge FX risk support underlying local currency bond markets in several respects. By allowing investors to separate currency risk from interest rate and credit risks, they attract more market participants and increase liquidity due to greater volumes. They also make it easier for debtors to diversify their issuance across currencies and regions.

Hedging instruments also facilitate the raising of funds in bond markets by lower quality credits, and thus alleviate some of the problems with the narrow range of credit quality in local currency markets discussed in part 3. When such instruments are available, a company can replicate the obligations of a local currency bond by

<sup>16</sup> Given their expertise and experience in markets, the central bank and/or the supervisory authority might be particularly well placed to take the initiative in supporting increased post trade transparency.

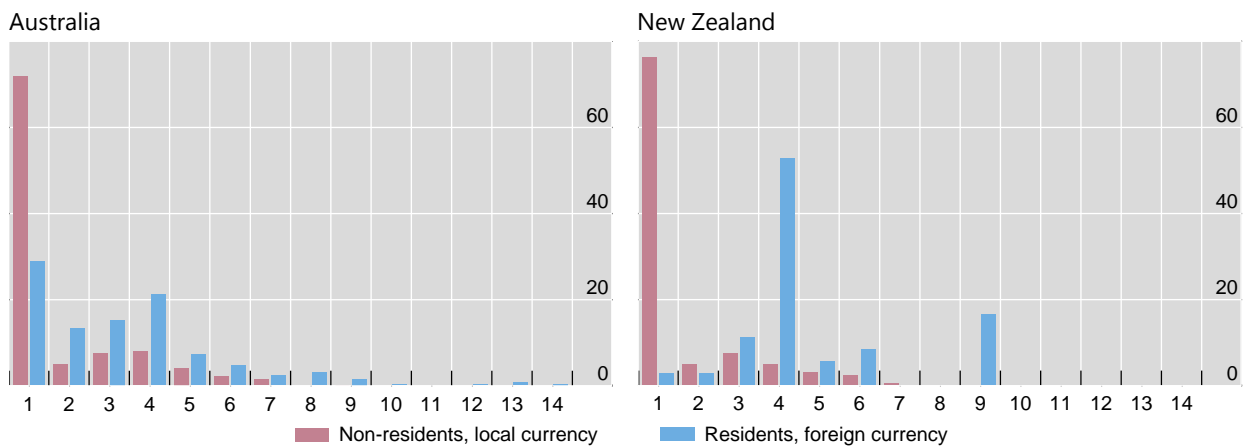
issuing in foreign currency and simultaneously swapping the funds raised into the local currency. And since offshore foreign currency markets often have the investor base and risk assessment infrastructure to offer access to lower quality credits, it follows that hedging instruments allow residents of lower credit quality to utilise these markets to obtain local currency funding.

As specific examples, in both Australia and New Zealand, issuance by residents in foreign currency is often lower rated than the non-resident issuance in domestic markets (Graph 4), which is consistent with the view that swap markets allow domestic issuers the opportunity to access liquid, lower-grade bond markets. And in both jurisdictions, it has been noted that more than four-fifths of external foreign currency-denominated debt liabilities were hedged into the local currency (Munro and Wooldridge, 2012).

### Credit ratings: local-currency bonds issued by non-residents vs foreign-currency bonds issued by residents

Percentage of total issuance in each category

Graph 4



1 = AAA/Aaa; 2 = AA+/Aa1; 3 = AA/Aa2; 4 = AA-/Aa3; 5 = A+/A1; 6 = A/A2; 7 = A-/A3; 8 = BBB+/Baa1; 9 = BBB/Baa2; 10 = BBB-/Baa3; 11 = BB+/Ba1; 12 = BB/Ba2; 13 = BB-/Ba3; 14 = lower than BB-/Ba3.

Source: Munro and Wooldridge (2012).

Thanks to other reasons such as increased trade and investment flows as well as operational incentives to hedge foreign currency exposure, the availability of instruments for hedging the risks of emerging market currencies has grown considerably. According to the BIS Triennial Central Bank Survey, the average daily turnover of FX derivatives in emerging market jurisdictions rose from \$380 billion in April 2010 to \$536 billion in April 2013. As for the currencies of emerging Asia, the combination of spot and derivative FX transactions rose by 40% over the same period, accounting for nearly one-half of the share of all turnover in emerging market currencies (Ehlers and Packer, 2013). The triennial survey has also documented that the most rapid growth in EM Asian currency turnover has been in the transactions conducted *offshore*. Fully 35 percentage points of the 41% growth in the turnover of EM Asian currency was accounted for by the off-shore component.

Private bank sources indicate that the liquidity of the onshore FX forward markets continue to differ significantly across jurisdictions, particularly in longer term contracts (Table 9, first column). Domestic forward markets are very liquid in Hong Kong and Thailand, where the reported range of 6-12 month forward spreads are 3-5, and 1-3 pips, respectively. A number of markets are less liquid: the spread of the

6-12 months FX forwards in China and the Philippines can amount to between 10-30 pips, and to 50-150 pips in the case of the Indonesian rupiah.

## Overview of currency risk hedging instruments

Table 9

	Onshore FX forward spread	Non-resident access to onshore FX hedging	Offshore market
China	6 months: 10–30 pips	Yes, if under QFII (spot only and subject to approved quota), cross border and CIBFXM mechanism	Avg daily NDF volume: USD 2 bn 1-month NDF spread: 20 pips
Hong Kong	1–3 months: 1–2 pips 6–12 months: 3–5 pips	Yes	None
Indonesia	1 month: 10–20 pips 2 months: 20–30 pips 3 months: 40–50 pips 6 months: 50–60 pips 1 year: 50–150 pips	Yes, for underlying investment	Avg daily NDF volume: USD 300–400 mn 1-month NDF spread: 10–15 pips
Korea	1 month: 10 pips	Yes, for underlying investment	Avg daily NDF volume: USD 4–5 bn 1-month NDF spread: 50 pips
Malaysia	1 month: 3 pips 3 months: 10 pips 6 months: 20 pips	Yes, for bond hedging	None
Philippines	1 month: 2 pips 12 months: 20–30 pips	Prior approval is required for FX swaps where the offshore counterparty is on the buy/sell side.	Avg daily NDF volume: USD 500 mn 1-month NDF spread: 2 pips
Singapore	Up to 6 months: 1–4 pips 6–12 months: 5–20 pips	Yes, outright FX allowed. On FX swaps restrictions on onshore banks to sell/buy SGD to offshore FI	None
Thailand	Up to 3 months: 0.7–1.0 pips 6–12 months: 1–3 pips	Yes; for non-spot only up to underlying investment	Avg daily option volume: USD 30mn

Source: HSBC (2015); national sources.

Differential liquidity likely reflects impediments of the use of FX derivatives markets in Asia and for Asian currencies (Table 9). Non-resident investors continue to have free access to onshore FX hedging instruments in Hong Kong and for the respective spot instruments in Singapore and Thailand. But the restrictions in the use of such instruments in other jurisdictions remain largely similar to those documented in Chan et al (2011). In Indonesia, Korea and Malaysia, foreign investors can use FX hedging tools only if they provide documentary proof of underlying exposure. In the Philippines, prior approval is required for FX swaps involving an offshore counterparty. One jurisdiction where significant progress can be reported is in China, where non-residents now have access to the spot market under the QFII scheme subject to approved quotas; and central banks, sovereign wealth funds and others have access under the China interbank bond market FX mechanism.

Offshore non-deliverable forward (NDF) transactions are the focus of the third column of Table 9. NDF volumes have increased quite a bit among many regional currencies, compared with 2011. In particular, the average daily volume of NDF transaction for renminbi has doubled to USD 2 billion while the Korean won and

Philippines peso have also recorded significant increases in NDF transactions. The level of NDF transactions for Indonesian rupiah is similar to that in 2011; in some currencies there is no active market.

As mentioned at the outset of this section, the development of hedging markets and local currency bond markets are naturally linked. FX swaps or derivatives markets which allow foreign borrowers to convert currencies can be a boon to local currency issuance. Likewise, the increased ability to invest across markets and hedge these investments – facilitated through further liberalization of the capital account among other measures – has been shown to increase issuance in local currency jurisdictions (Mizen et al, 2012). Hedging markets can also contribute to financial stability in domestic markets in a fashion that fosters their long-term development.

For these reasons, we recommend that EMEAP jurisdictions redouble their efforts to foster robust and efficient markets for hedging FX risk, and remove remaining impediments in the capital account whenever possible. To this end, activity in off-shore markets should also by no means be discouraged. Competition from the offshore markets can improve domestic policies and market efficiency, not least by reducing the power of domestic incumbents that benefit from domestic regulations (Rajan and Zingales, 2000; Eichengreen, 2015).

## 7. More information is needed on repo markets in the region

It is now widely recognized that the development of repo markets is important for the development and liquidity of local currency bond markets more generally. This point was emphasized very strongly in the above-mentioned 2011 report for EMEAP. The report emphasized that repo markets were lagging well beyond unsecured money markets in the region, both in terms of the variety of collateral provided and the parties to the transactions.

At that time, the lack of a legal apparatus was emphasized: financial institutions were imposing credit limits on repo transactions because existing legal frameworks in many jurisdictions failed to ensure that lender could take possession of collateral. Many authorities were not yet utilizing the Global Master Repurchase Agreement (GMRA) which stipulates safeguards to credit rights; neither had they initiated a market wide standard local annex to GMRA which would encourage its use among private parties.

The 2011 report also emphasized the lack of suitable collateral – in particular, corporate and asset-backed instruments were not available as collateral for repo transactions, leading many foreign banks to turn to FX swaps markets. The report also cited the tri-party repo, in which a clearing bank serves as a third party between lender and borrower, as well as centralized custodian of collateral determining its eligibility, as an underutilized “solution to the problems of repo markets.” The clearing banks in tri-party agreements can provide a variety of services of particular value to non-banks, as well as reduce counterparty and operational risks of a repo.

In August 2014, the EMEAP Working Group on Financial Markets published a stock-take on repo market development. By the time of the report, significant progress had been documented in a number of jurisdictions. In China, Korea and Thailand repo markets had grown significantly: in Korea, daily turnover more than

quadrupled between 2010 and 2013; in China, it nearly doubled over the same time period; in Thailand it grew by nearly 50% between 2009 and 2013. The Korean development reflected regulatory initiatives that limited the call money market, and represented a significant deepening of repo markets relative to overall bond market size.

In terms of the standardisation of legal documentation, some progress had been made in a number of jurisdictions (Table 10). In Indonesia, there has been the introduction of a December 2013 Master Repurchase Agreement (mini MRA) as a standard contract, and the number of banks using the new agreement had increased markedly. In China, as part of “the establishment of a dedicated market infrastructure and legal framework”, the National Association of Financial Market Institutional Investors (NAFMII) integrated two distinct master repo agreements in 2013 into a single agreement, which newly included language for important issues such as substitution and valuation of collateral, transfer of margin. In Thailand, a new standard Thai language repo master agreement was introduced in 2010. And in terms of repo market infrastructure, tri-party solutions for repos were introduced in Japan and Australia in 2011 and 2014, respectively.

That said, reflecting the fact that “repo markets vary significantly across the region in terms of their importance in financing and securities market function,” the report also identified a number of specific country impediments.<sup>17</sup> For instance, according to accounting practice in Indonesia, repos are treated as a secured loan whereby collateral remains on the balance sheet, meaning that a true sale, or transfer of ownership, does not occur at the time of the repo transaction. This contributes to uncertainty about the treatment of collateral in bankruptcy. Similarly, in the Philippines, there are restrictions on the use of collateral which diminishes its characteristics as a “true repo”.

Tri-party repo arrangements were still not available in five of the EMEAP jurisdictions: China, Indonesia, Malaysia, New Zealand, and Singapore (in another jurisdiction, Thailand, it had been established but was not in widespread use). GMRA’s were still not available for use in China, Indonesia and the Philippines.

A view expressed by some members is that developing the market for longer-term repos would support the overall development of capital.<sup>18</sup> The EMEAP jurisdictions report differing trends in this respect. For instance, in Malaysia, the tenor of repo has increased, as the average repo terms grew from 22 days in 2006, to 44 days in 2011 and further to 67 days in 2013, reportedly reflecting increased confidence between counterparties. On the other hand, in Korea, there has been an increase in shorter-term repo because securities companies have moved out of the overnight call market.

<sup>17</sup> At the same time, the report recognized macroeconomic conditions had been broadly unfavorable to the evolution of repo markets. Long periods of ample liquidity meant that new sources of demand for funding using collateral were structurally subdued, leading to less incentive to spend the time and efforts to master operational complexities and deviate from historical patterns of reliance on unsecured funding for intermediaries in the region.

<sup>18</sup> The development of Securities Borrowing and Lending markets (SBL), which also enhance liquidity in secondary bond markets, is discussed by the report of the EMEAP Working Group on ABF2 Enhancement (2015). However, our interviews with market participants suggested that the demand for longer-dated, non-government securities was rather limited at the current juncture.

Structure of repo market by jurisdiction

Table 10

Jurisdiction	Type of repo	Documentation	Availability of tri-party repo	Withholding tax
China	Pledge repo (turnover approx. 96.6%) Classic repo (turnover approx.. 3.4%)	Master agreement by local industry association	No	No
Hong Kong	Classic repo; Borrow and lend also exists	GMRA	Yes	No
Indonesia	Buy/Sell-back (mainly) and classic repo	Local MRA and Mini MRA; GMRA Indonesia Annex still in the draft stage	No	Yes
Korea	Classic repo	GMRA	Yes	Yes
Malaysia	Classic and buy/sell back	GMRA 2000 agreement and a standard local annex	No	No
Philippines	Classic repo	PDEX inter-professional repo market program master agreement	Yes	Yes
Singapore	Classic repo; Overnight repo transaction mostly collateralised against government securities	GMRA	No	No
Thailand	Classic repo (mainly); Sell/Buy back structure exists but is not widely used	GMRA and a Thailand annex	Yes	No

Sources: Asia Securities Industry and Financial Markets, *Guide on Repo in Asia*; EMEAP Working Group on Financial Markets, *EMEAP Repo Markets: State of Play*.

On the whole, however, industry sources are fairly consistent in indicating that term repos are becoming more utilized as a result of regulatory pressures to increase the duration of their liabilities (ASIFMA, 2015). That result could not be confirmed in the EMEAP report, however, as the tenor composition of repos was not available for 4 jurisdictions, and not reported for others. Another stylized fact that has emerged in interviews with private sector market participants is that synthetic repos have increasingly emerged as an alternative to conventional repo at longer maturities (see Box C).

To identify where policy actions might have the greatest effect, and to help fill certain gaps that are evident in the availability of local repo market information, it may be worthwhile for EMEAP to conduct a survey, or to request a survey be undertaken by the Asian Securities Industry and Financial Markets Association (ASIFMA). The European Repo Council of the International Capital Markets Association (ICMA) conducts semi-annual surveys of the repo market in Europe: the June 2015 survey was completed by more than 65 offices of 63 financial groups operating in a number of European financial centers (ICMA, 2015). Questions asked not only concerned the value of repo and reverse repo contracts outstanding, but also the currency, the type of counterparty, the contract and repo rate, the remaining term to maturity, the method of settlement, the origin of collateral, etc.



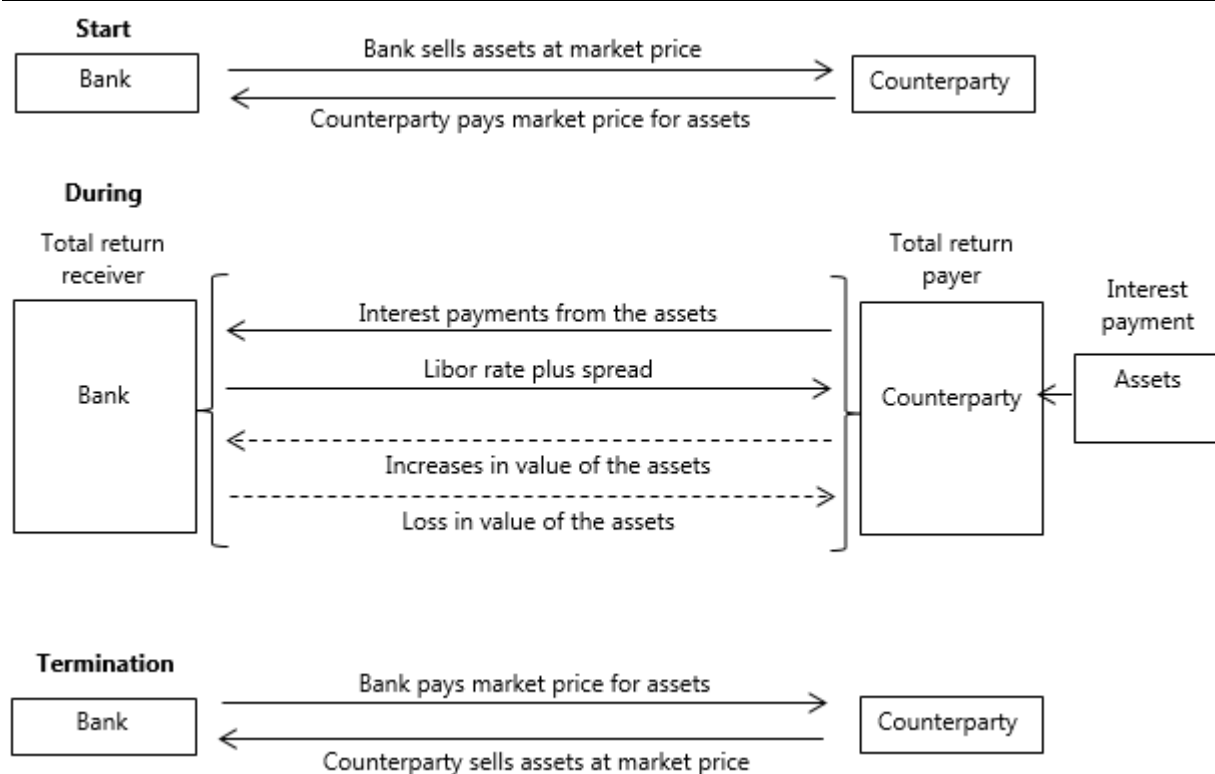
## Total return swaps and “synthetic repo”

Market participants have noted that so-called total return swaps provide an increasingly popular alternative to conventional repo transactions. These are sometimes called “synthetic repos”, because they are a combination of financial instruments that provide the same cash flows as a conventional repo, with virtually identical risks (see Figure A, below)

Synthetic repos combine an outright sale and promised repurchase of an asset. At the same time, the purchaser and receiver enter into a swap agreement whereby the seller of the asset agrees to pay the counterparty LIBOR interest plus a spread while in return receiving interest payments from the asset. Changes in the value of the asset are transferred to the selling bank as well, thus leaving the risk with the bank. At the termination of the transaction, the counterparty will sell the asset, often back to the original purchaser. Though the conventional repo has the same economic outcome, many counterparties reportedly prefer achieving a repo payoff via a total return swap because the transactions are off balance sheet and use ISDA documentation (Bank of England, 2010).

Typical synthetic repo structure

Figure A



Source: Bank of England (2010).

There are a number of data gaps which might be addressed. For instance, in Indonesia data on collateral other than sovereign debt is not available. In conversations with officers of ASIFMA, we heard not only willingness to conduct a similar survey in the Asian markets, but also inquiries about the value of such a survey for policymakers. Assuming EMEAP members themselves do not have the resources to conduct such a cross-country survey at present, we recommend that EMEAP

encourage ASIFMA to proceed with a similar survey, as a semi-annual or annual exercise and funded by ASIFMA, for financial institutions operating in Asia. The centralization of such an initiative, in an organization such as ASIFMA, is probably an efficient and effective way of carrying it out. In the case of the survey in Asia, it could also include questions about the market for corporate bonds and project bonds, as well as the role of credit ratings of the underlying collateral for repo transactions more generally.

## 8. Conclusion

Asian financial markets have come a long way since the inception of the ABF2 funds. This is particularly true for government bond markets. The work left to be done is to a great extent related to the corporate bond market, sometimes referred to as the “spare tire”. While the development of government bond markets often complements that of corporate bonds, we recommend an increased focus on issues intrinsic to corporate bond market development. For instance, we believe that EMEAP members would be well served by taking measures to encourage a wider range of credit quality outstanding in their jurisdictions’ corporate bond markets. One way to do so would be to lower or remove minimum credit rating requirements for institutional investors.

Infrastructure bonds remain undeveloped as an asset class, particularly project-specific bonds. We propose that EMEAP establish pre-eligibility criteria for project-specific infrastructure bonds in which EMEAP members would consider investment. To improve liquidity in secondary markets, another strategy for EMEAP would be to coordinate and standardize the post-trade reporting requirements most appropriate for the region’s bond markets. Members should also be encouraged to remove any remaining impediments to the development of FX hedging markets whenever possible. Finally, to maximize the support from repo markets, a survey could be conducted to close existing data gaps and identify optimal policy actions.

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