Introduction: Spillovers from Major Advanced Economies Drive Bond Yields Up in Emerging East Asia

On the back of a brightening global outlook, government bond yields in major advanced economies rose between 1 June and 15 August, with the increase extending to emerging East Asia.[2] Yields on 2-year and 10-year local currency (LCY) government bonds edged up in most emerging East Asian economies during the review period, tracking the rising yields in advanced economies (**Table A**). Hong Kong, China witnessed the largest yield increase on both 2-year and 10-year government bonds, reflecting higher yields in the United States (US) as well as stronger domestic growth prospects. The Republic of Korea saw a larger increase in short-term yields than in long-term yields, with a 15 basis points (bps) increase on 2-year government bonds. In the Philippines, the 2-year yield rose only 1 bp and the 10-year yield rose 8 bps. Singapore tracked US yields, while higher yields in Malaysia were largely driven by investor pessimism associated with soft oil prices. In the People's Republic of China (PRC), the yield on 10-year government bonds rose and the yield on 2-year government bonds fell as the People's Bank of China stabilized market liquidity in June via reverse repurchase agreements and lending facilities operations.

While bond yields in emerging East Asia generally trended upward, yields in Indonesia, Thailand, and Viet Nam were the exceptions. In these markets, bond yields have continued to decline since the beginning of 2017. While the declines earlier this year were generally driven by positive investor sentiment, market-specific factors contributed to the discrepancy in bond yield movements between 1 June and 15 August in these three markets compared with other

Table A: Changes in Global Financial Conditions

	2-Year Government Bond (bps)	10-Year Government Bond (bps)	5-Year Credit Default Swap Spread (bps)	Equity Index (%)	FX Rate (%)
Major Advanced Economies					
United States	6	6	–	1.4	–
United Kingdom	9	1	(7)	(2.1)	(0.1)
Japan	5	0.3	2	1.3	0.6
Germany	0.2	13	(3)	(3.9)	4.7
Emerging East Asia					
China, People's Rep. of	(16)	7	(11)	4.8	1.8
Hong Kong, China	18	24	–	5.3	(0.4)
Indonesia	(8)	(4)	(12)	1.7	(0.4)
Korea, Rep. of	15	9	9	(0.4)	(1.2)
Malaysia	9	10	(17)	0.5	(0.2)
Philippines	1	8	(10)	1.0	(3.2)
Singapore	4	6	–	1.8	1.4
Thailand	(13)	(19)	5	0.3	2.6
Viet Nam	(41)	(42)	3	3.9	(0.1)
Select European Markets					
Greece	(178)	(47)	(33)	5.9	4.7
Ireland	(2)	(0.8)	(11)	(3.9)	4.7
Italy	(10)	(14)	(34)	3.8	4.7
Portugal	(19)	(9)	(26)	(1.3)	4.7
Spain	(6)	(5)	(8)	(3.7)	4.7

( ) = negative, – = not available, bps = basis points, FX = foreign exchange.
Notes:
1. Data reflect changes between 1 June 2017 and 15 August 2017.
2. A positive (negative) value for the FX rate indicates the appreciation (depreciation) of the local currency against the United States dollar.
Sources: Bloomberg LP and Institute of International Finance.

[2] Emerging East Asia comprises the People's Republic of China; Hong Kong, China; Indonesia; the Republic of Korea; Malaysia; the Philippines; Singapore; Thailand; and Viet Nam.

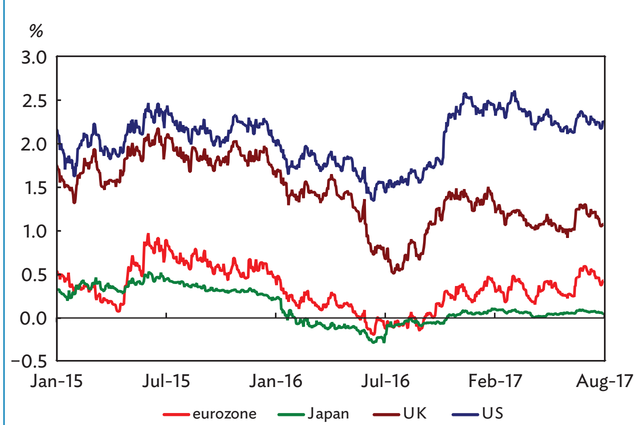
emerging East Asian markets. Yields fell in Indonesia on the back of market optimism and strong capital inflows following a rating upgrade by S&P Global in May. Despite an uptick in inflation in Indonesia during the first half of the year, largely driven by electricity tariff adjustments and seasonal factors like Ramadan and Eid al-Fitr, Bank Indonesia expects inflation to ease by the second half of the year. In Thailand, strong foreign investment pushed down both 2-year and 10-year bond yields. The largest decline was seen in Viet Nam, where the central bank reduced the policy rate by 25 bps on 10 July.

Between 1 June and 15 August, 2-year and 10-year government bond yields climbed in major advanced economies. Overall sentiment remains positive and markets expect global growth to strengthen (**Figure A1**). In its latest July forecast, the International Monetary Fund projects global gross domestic product (GDP) growth to pick up from 3.2% in 2016 to 3.5% in 2017. Growth is also strengthening in developing Asia, as evidenced by the Asian Development Bank upgrading its regional growth forecast for 2017 from 5.7% to 5.9% in July.[3]

The US labor market remains firm and had a relatively low unemployment rate of 4.3% in July and 4.4% in August.[4] Nonfarm payrolls increased by 189,000 in July and 156,000 in August. Job gains averaged 176,000 per month in January–August. Economic activity expanded moderately, driven by rising domestic consumption and business fixed investment. According to the statement of the July meeting of the Federal Open Market Committee, inflation may remain below the target of 2% in the short-term despite the tight labor market.[5] The Federal Reserve believes that US economic expansion is on track and signaled it would start normalizing its balance sheet relatively soon in anticipation of further strengthening of economic activity and the labor market.

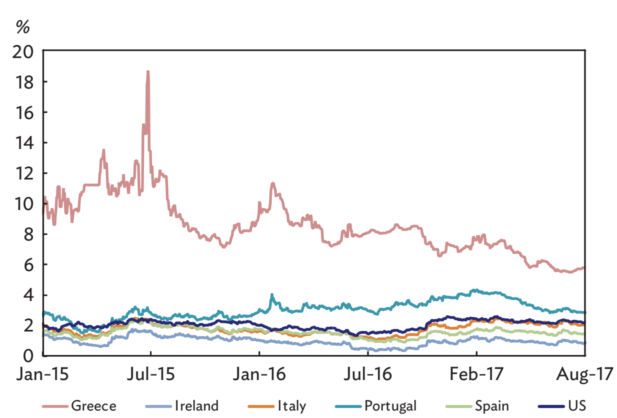
The European Central Bank (ECB) updated its economic forecast on 7 June. The forecast for the eurozone's GDP growth for full-year 2017 was upgraded to 1.9% from 1.8%. The GDP growth forecast for 2018 was raised to 1.8% from 1.7%, and for 2019 it was raised to 1.7% from 1.6%.[6] GDP growth in the eurozone rose to 0.6% quarter-on-quarter in the second quarter of 2017 from 0.5% quarter-on-quarter in the first quarter of 2017.[7] At its latest meeting, the ECB decided to keep interest rates unchanged and confirmed that the current monthly net asset purchases of EUR60 billion would continue until the end of 2017, with a possible extension if necessary.[8] With monetary policy largely accommodative, a pick-up in GDP growth raised forecasts for headline inflation. Overall, improved investment sentiment is driving down bond yields in many European markets (**Figure A2**).

Figure A1: 10-Year Government Bond Yields in Major Advanced Economies (% per annum)



UK = United Kingdom, US = United States.
Source: Bloomberg LP.

Figure A2: 10-Year Government Bond Yields in Select European Markets and the United States (% per annum)



US = United States.
Source: Bloomberg LP.

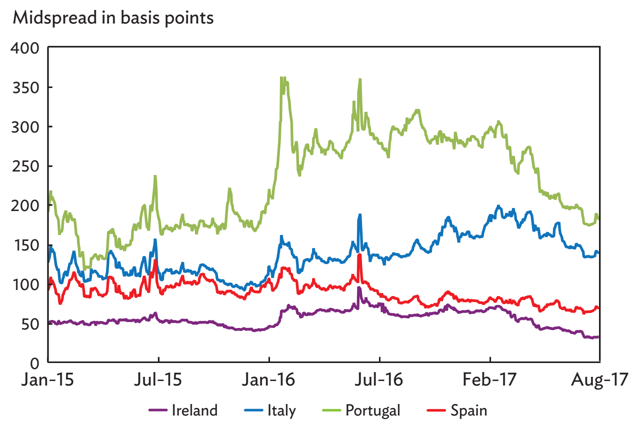
[3] Developing Asia comprises the 45 regional developing member economies of the Asian Development Bank.
[4] Data are from the Government of the United States, Bureau of Labor Statistics. Economic Releases. https://www.bls.gov/news.release/empsit.nr0.htm
[5] Board of Governors of the Federal Reserve System. Press Releases. https://www.federalreserve.gov/newsevents/pressreleases/monetary20170726a.htm
[6] Eurostat. https://www.ecb.europa.eu/pub/pdf/other/ecb.projections201706_eurosystemstaff.en.pdf?744284f3ab1d7bfe11109182def03529
[7] Eurostat. http://ec.europa.eu/eurostat/documents/2995521/8213935/2-07092017-AP-EN.pdf/6fe1f60c-51e2-4b98-9d14-ca6ea5c7e260
[8] Eurostat. https://www.ecb.europa.eu/press/pr/date/2017/html/ecb.mp170720.en.html

The Japanese economy maintained its strong growth momentum, with GDP expanding at an annual rate of 2.5% in the second quarter of 2017 after a 1.2% increase in the previous quarter.[9] At its monetary policy meeting on 20 July, the Bank of Japan (BOJ) confirmed that it expects the economy to continue to expand moderately and upgraded its growth forecast for 2017 to 1.8% from 1.6% and for 2018 to 1.4% from 1.3%. According to the BOJ, although inflation is trending upward, it is still not firm enough. Like the ECB, the BOJ indicated that it will maintain its accommodative, pro-growth monetary policy stance.

The benign global economic outlook has boosted investor sentiment. Credit default swap spreads generally trended down across emerging East Asia (**Figure B**) and in Europe (**Figure C**). Bond market spreads declined for the region as a whole and in individual emerging East Asian markets. However, the Chicago Board Options Exchange's Volatility Index experienced a spike in August due to geopolitical concerns (**Figure D**). Most markets in emerging East Asia seemed unaffected as evidenced by their stripped spreads (**Figure E**). Equity markets posted gains in all emerging East Asian markets except for the Republic of Korea (**Figure F**).

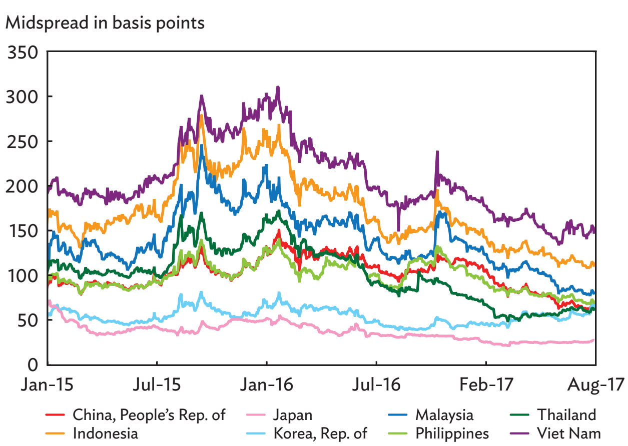
The positive sentiment has encouraged foreign investors to further increase their holdings of LCY government bonds in emerging East Asia. Indonesia, Malaysia, and Thailand each posted an increase of more than 1 percentage point in the share of foreign investor holdings between the end of March and the end of June (**Figure G**). In response to the gradual lifting of restrictions on foreign investor access to the PRC bond market, the foreign holdings' share has inched up in the PRC in recent quarters. In July, the PRC introduced

Figure C: Credit Default Swap Spreads for Select European Markets (senior 5-year)



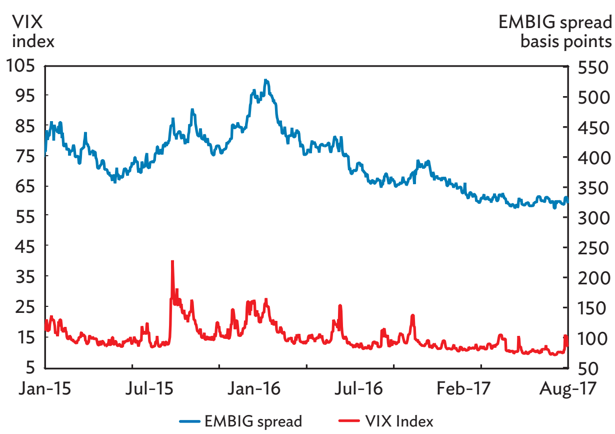
Notes:
1. Based on USD-denominated sovereign bonds.
2. Data as of 15 August 2017.
Source: Bloomberg LP.

Figure B: Credit Default Swap Spreads for Select Asian Markets (senior 5-year)



Notes:
1. Based on USD-denominated sovereign bonds.
2. Data as of 15 August 2017.
Source: Bloomberg LP.

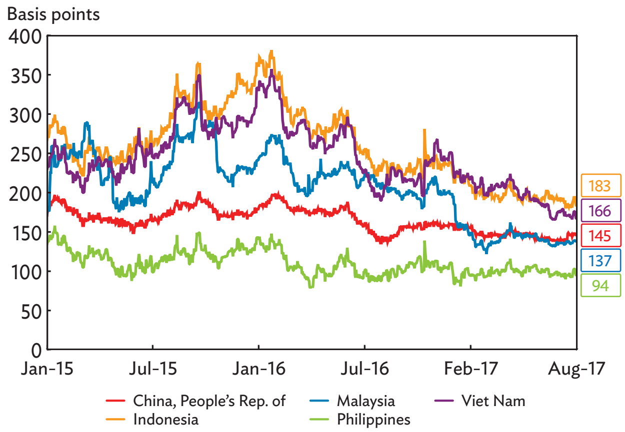
Figure D: United States Equity Volatility and Emerging Market Sovereign Bond Spread



EMBIG = Emerging Markets Bond Index Global, VIX = Chicago Board Options Exchange Volatility Index.
Note: Data as of 15 August 2017.
Source: Bloomberg LP.

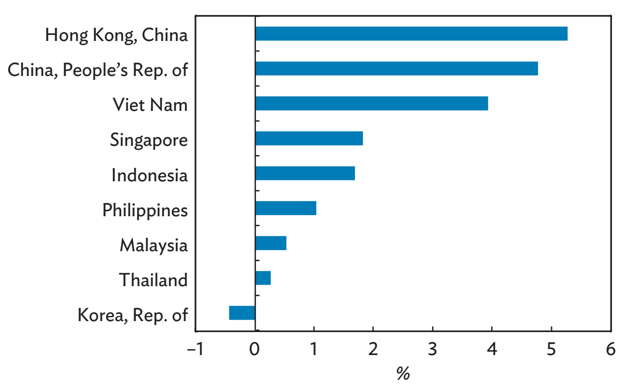
[9] http://www.esri.cao.go.jp/jp/sna/data/data_list/sokuhou/gaiyou/pdf/main_1.pdf

Figure E: JP Morgan Emerging Markets Bond Index Sovereign Stripped Spreads



Notes:
1. Based on United States dollar-denominated sovereign bonds.
2. Data as of 15 August 2017.
Source: Bloomberg LP.

Figure F: Changes in Equity Indexes in Emerging East Asia

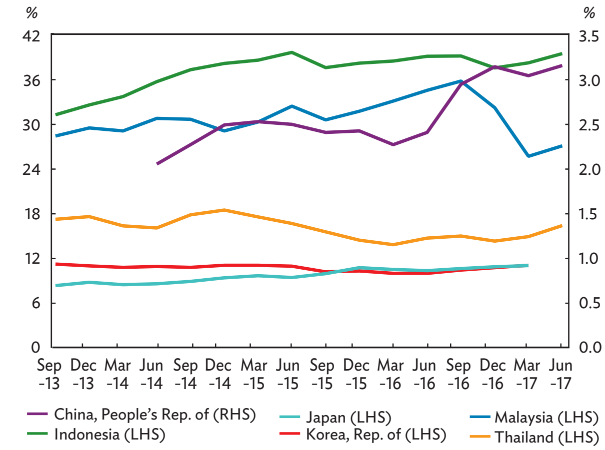


Note: Changes between 1 June and 15 August.
Source: Bloomberg LP.

Bond Connect to further facilitate foreign investors' entry into the PRC interbank bond market (**Box 1**).

Due to the Federal Reserve's normalization of its monetary policy stance, most emerging East Asian currencies slightly depreciated against the US dollar between 1 June and 15 August (**Figure H**). The exceptions were the Chinese renminbi, Singapore dollar, and Thai baht, which each marginally appreciated during the review period.

Figure G: Foreign Holdings of Local Currency Government Bonds in Select Asian Economies (% of total)



LHS = left-hand side, RHS = right-hand side.
Note: Data as of end-June 2017 except for Japan and the Republic of Korea (end-March 2017).
Source: *AsianBondsOnline*.

At the global level, economic growth is gaining momentum and risks to financial stability are receding. Against the backdrop of a strong and improving macroeconomic outlook, the overall environment for emerging East Asia's LCY bond markets remains benign, with lower credit default swap spreads and more foreign participation. Even so, the markets are subject to some downside risks.

One risk is the normalization of the Federal Reserve's balance sheet, which signals a potential tightening of global liquidity conditions. The Federal Reserve is also raising interest rates in response to improving US economic conditions. While Asian policy makers grapple with the ramifications of rising US interest rates on the stability of their financial systems, they may soon find themselves facing another significant shift in US monetary policy.

In March, the Federal Reserve first indicated that it would start to unwind the more than USD4 trillion of US Treasuries and mortgage-backed securities that it added to its balance sheet in response to the global financial crisis. Over the past several months, the Federal Reserve has been cautiously preparing financial markets for the eventual unwinding of its massive holdings of debt securities. The markets expect the unwinding program to start as soon as September. To minimize the

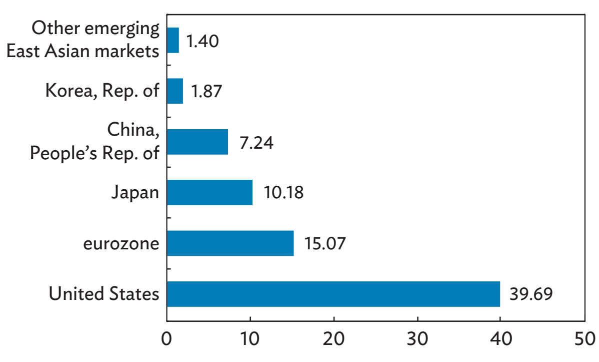
Box 1: Bond Connect—Linking the People's Republic of China's Bond Market to the World

To further open its capital markets, the People's Republic of China (PRC) introduced Bond Connect to allow Chinese and foreign investors access to overseas and domestic bond markets. The Northbound Trading program was launched on 3 July 2017 as the first phase of Bond Connect to enable international investors to participate in the PRC's interbank bond market through an arrangement between Hong Kong, China and the PRC that covers trading, custody, and settlement. Bond Connect seeks to improve the accessibility of the PRC bond market to foreign investors and foster regional financial market integration in emerging East Asia.

The PRC's local currency bond market is the largest among all emerging economies and the fourth-largest in the world, trailing only the United States (US), eurozone, and Japan in terms of bonds outstanding **(Figure B1.1)**. At the end of March 2017, the aggregated debt securities outstanding in the PRC bond market reached USD7.2 trillion. Notwithstanding the PRC bond market's size, a lack of accessibility limits foreign investor participation. At the end of March 2017, the average share of foreign investor holdings in major emerging East Asian LCY government bond markets stood at 22%, while the corresponding figure for the PRC was less than 5% **(Figure B1.2)**.

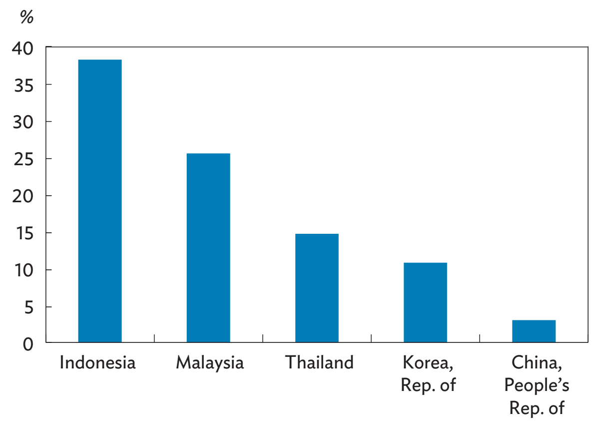
Greater accessibility to the PRC bond market would contribute to regional and global bond market integration by expanding the universe of major investment instruments and

Figure B1.1: Local Currency Bonds Outstanding in Select Global Markets



USD = United States dollar.
Notes:
1. Data as of 31 March 2017.
2. "Other emerging East Asian markets" include Hong Kong, China; Indonesia; Malaysia; the Philippines; Singapore; Thailand; and Viet Nam.
Sources: Securities Industry and Financial Markets Association, European Central Bank, and *AsianBondsOnline*.

Figure B1.2: Share of Foreign Holdings in Select Emerging East Asian Local Currency Government Bond Markets



Note: Data as of 31 March 2017.
Source: *AsianBondsOnline*.

enhancing cross-border portfolio diversification and risk-sharing. Furthermore, greater accessibility to the PRC bond market would help satisfy the large and growing demand of global investors for renminbi-denominated assets, especially Treasury bonds. Following the International Monetary Fund's announcement of the inclusion of the renminbi in the Special Drawing Right valuation basket in November 2015, foreign holdings in the PRC bond market increased from USD116.6 billion at the end of December 2015 to USD120.4 billion at the end of March 2017. In addition, among the five economies whose currencies comprise the Special Drawing Right basket, the PRC's Treasury bonds offer the highest yields **(Figure B1.3)**. Thus, better access to the PRC bond market would provide global investors with more attractive investment opportunities.

The market influence of Northbound Trading might be limited in the short-term.

The PRC bond market's degree of openness has evolved significantly during the past decade. However, the marginal contribution of Northbound Trading in attracting foreign investment might be limited in the short-term.

The PRC's initial effort to open its bond market to foreign investors can be traced to August 2010 when three types of foreign institutions—foreign central banks; renminbi-clearing banks in Hong Kong, China and Macau, China; and

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Box 1: Bond Connect—Linking the People's Republic of China's Bond Market to the World

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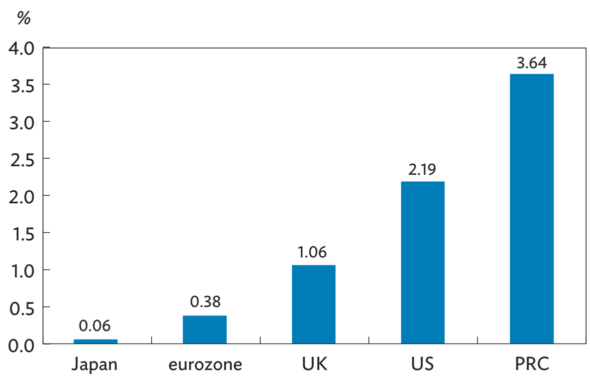
Figure B1.3: 10-Year Government Bond Yields of Economies Comprising the Special Drawing Right Basket



PRC = People's Republic of China, UK = United Kingdom, US = United States.
Note: Data refer to 10-year bond yield as of 11 August 2017.
Source: Bloomberg LP.

overseas participating banks for renminbi settlement—were first allowed to trade in the PRC interbank bond market. The purpose was to facilitate renminbi settlement in cross-border trades. The next milestone was to allow Qualified Foreign Institutional Investors and Renminbi Qualified Foreign Institutional Investors to invest in the PRC interbank bond market under a quota ceiling in 2013. Additional investment restrictions on foreign institutions were gradually lifted beginning in the second half of 2015, resulting in the removal of quotas, more types of foreign institutions being allowed to participate, and more instruments (e.g., repo agreements and bond derivative instruments) becoming accessible. In addition, Renminbi Qualified Foreign Institutional Investors were allowed to access the interbank foreign exchange market to hedge exchange rate risks.

Bond Connect supplements these existing measures. While some foreign participants could access the PRC bond market via channels that existed prior to the introduction of Bond Connect, the implementation of Northbound Trading facilitates the entry of a range of new market participants. For example, relatively small financial institutions will find it easier to invest in the PRC bond market given the simplified trading procedures. Furthermore, unlike the previous arrangements, Bond Connect now allows investors to connect directly to the PRC bond market via the Hong Kong Central Money Markets Unit without onshore registration. In other words, Bond Connect lowers the entry barrier for general global investors interested in the PRC bond market.

While the implementation of Northbound Trading increases the accessibility of the PRC bond market for foreign investors, it alone may not lead to a surge in foreign participation. This is because foreign investment also depends on other factors, including exchange rate fluctuations, sovereign credit ratings, and the risk–return profile of the asset set (e.g., bond yield patterns).

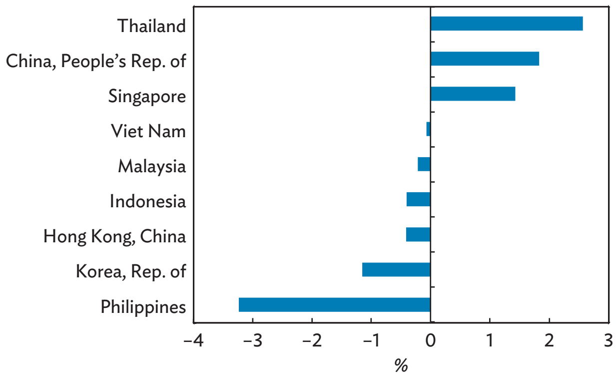
Bond Connect will promote regional bond market integration over the medium-term and long-term.

The impact of Northbound Trading on foreign participation may be limited in the short-term, but the introduction of Bond Connect will benefit regional bond market integration in the medium-term and long-term.

Earlier measures to open capital markets in the PRC include the launching of Shanghai–Hong Kong Stock Connect in November 2014 and Shenzhen–Hong Kong Stock Connect in December 2016. Both measures were aimed at facilitating the participation of foreign investors in the PRC's A-share market and they contributed to the initial inclusion of around 200 PRC stocks in the MSCI Emerging Markets Index beginning in June 2018. The inclusion of these stocks in the benchmark index will help soften investment restrictions, improve information disclosure, and strengthen the overall institutional environment.

The gradual opening of its interbank bond market led to the PRC's inclusion in March 2017 in the Bloomberg Barclays Global Aggregate + China Index and the Citi World Government Bond Index-Extended. As the PRC's bond market opens further, it may become eligible for inclusion in other major international benchmark indexes. In the long-term, these advances will promote financial integration between the PRC and the rest of the world via better information dissemination, strengthened investor protection, improved bond market infrastructure, and more consistent credit ratings.

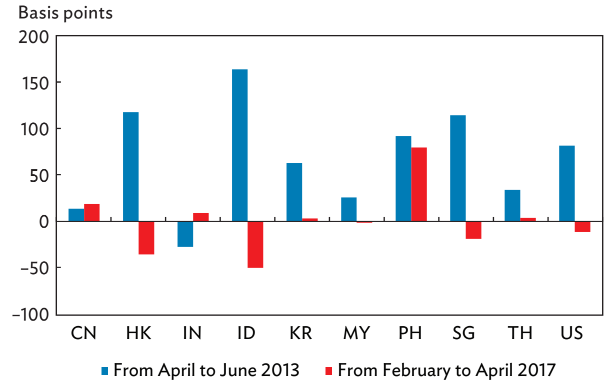
Figure H: Changes in United States Dollar Value per Unit of Local Currency



Notes:
1. Changes between 1 June and 15 August.
2. A positive (negative) value for the foreign exchange rate indicates the appreciation (depreciation) of the local currency against the United States dollar.

Source: Bloomberg LP.

Figure I: Comparison in Yield Changes of 10-Year Sovereign Bonds in Select Emerging Asian Markets and the United States



CN = People's Republic of China; HK = Hong Kong, China; IN = India; ID = Indonesia; KR = Republic of Korea; LCY = local currency; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; US = United States.

Source: Bloomberg LP.

impact on liquidity, the initial unwinding program will take the form of the Federal Reserve not reinvesting some proceeds from its bond holdings, rather than selling the bonds.

During the so-called taper tantrum of May 2013, an unanticipated Federal Reserve announcement on balance sheet normalization destabilized financial markets around the world, including emerging East Asian markets. Mindful of this previous episode, the Federal Reserve has reassured markets by communicating its normalization plans in a clear and transparent way. It is preparing to proceed with normalization cautiously and gradually. The reaction of the markets to the initial announcement in March was noticeably more subdued than during the taper tantrum (**Figure I**).

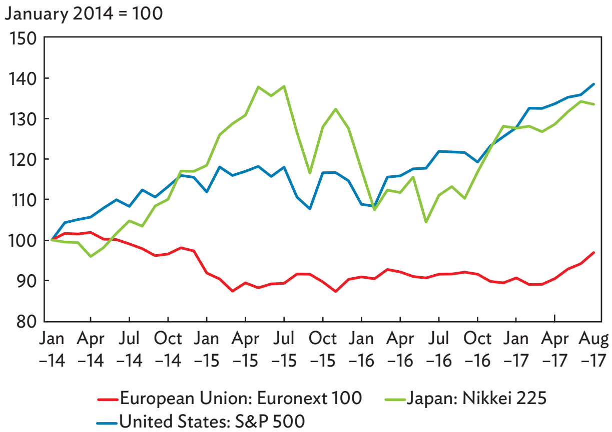
Nevertheless, the Federal Reserve's balance sheet normalization may signal a pronounced shift toward tightening global liquidity conditions, which in turn will affect Asian financial systems in the next few years through at least three channels. First, US monetary policy tightening would increase the rate of return on investments in the US and strengthen the US dollar, leading to capital outflows from emerging Asia.[10] Second, long-term financing costs may rise as US monetary normalization pushes up bond yields in the US with spillover effects in Asia. Third, the leverage buildup in emerging Asia during the recent period of low global interest rates poses risks to the balance sheets of financial institutions and corporations with a high degree of leverage and significant debt exposure.

The risk of a correction in global equity markets also represents risk to emerging Asian financial systems. Both global and regional equities have surged in recent months (**Figures J1, J2**). To some extent, the surge reflects improving fundamentals, especially strengthening global and regional growth prospects. Nevertheless, the magnitude of the equity rally and limited volatility in the markets against a background of policy uncertainty means there is scope for a market correction. The correction would crimp business and consumer confidence, and adversely affect economic growth.

Lastly, a structural risk faced by many economies in the region is population aging. When longevity increases, economies face the challenge of protecting the economic security of their elderly populations. Innovative financial instruments can offer a solution to the longevity risk that increasingly confronts many emerging Asian economies (**Box 2**).

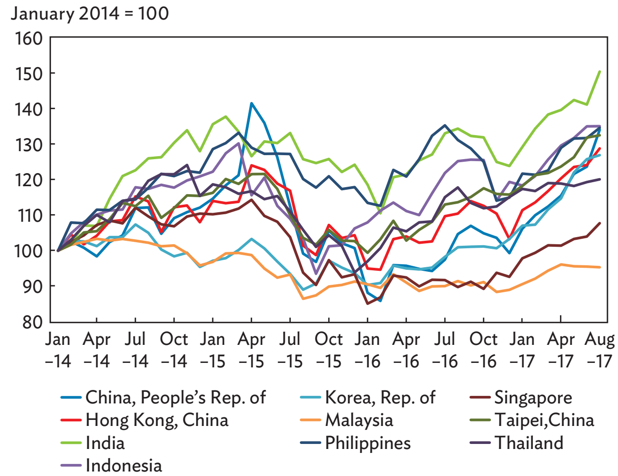
[10] Emerging Asia comprises the People's Republic of China; Hong Kong, China; India; Indonesia; the Republic of Korea; Malaysia; the Philippines; Singapore; Thailand; and Viet Nam.

Figure J1: Stock Market Performance in Major Advanced Economies



S&P = Standard and Poor's.
Source: Bloomberg LP, accessed 18 August 2017.

Figure J2: Stock Market Performance in Select Emerging Markets

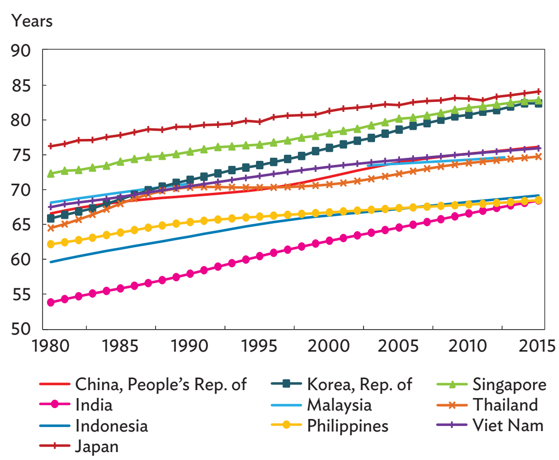


Note: Without dividends and based on local currency.
Source: Haver Analytics, accessed 18 August 2017.

Box 2: Coping with Longevity Risk—A Conceptual Solution

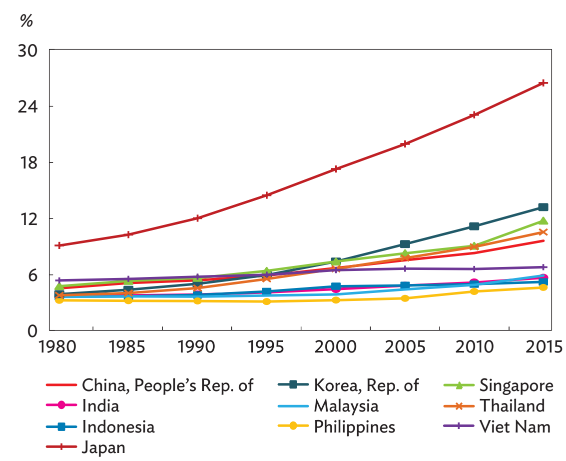
Over the past 50 years, there has been a dramatic increase in longevity across Asia due to increased living standards and advances in medical technology (**Figure B2.1**).[a] Life expectancy will continue to trend upward, although at an unpredictable pace. As individuals live longer, the share of the elderly population (aged 65 years and above) is going to increase in Asian economies (**Figure B2.2**). Furthermore, the elderly are going to spend more years in retirement and

Figure B2.1: Life Expectancy at Birth in Select Asian Economies



Source: Haver Analytics, accessed 16 August 2017.

Figure B2.2: Share of Population Aged 65 Years and Above in Select Asian Economies



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision, DVD Edition.

[a] Asia comprises the People's Republic of China, India, Indonesia, Japan, the Republic of Korea, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam.

continued on next page

Box 2: Coping with Longevity Risk—A Conceptual Solution *continued*

many of them will be dependent on caregiver services. These individuals will face longevity risk in the sense that they may outlive their financial resources; that is, their post-retirement pension benefits and/or savings may be insufficient to maintain reasonable living standards. Moreover, pensioners may face a reduction in benefits due to the increase in longevity.

As the population ages in an economy, longevity risk affects not only individuals but also institutions, including pension funds, life insurance companies, life annuity providers, and a range of public sector entities. While the demand for managing longevity risk is growing, the high degree of uncertainty makes currently available financial instruments very expensive. New solutions are required for dealing with the present generation of elderly people as well as with future generations. There is clearly a need for more efficient and less expensive solutions than those that currently exist.

A proposed financial solution for dealing with longevity risk

Although there is demand for financial instruments such as longevity bonds and longevity swaps, available instruments are limited and very expensive. The main reason is that suppliers are mainly speculators that provide these instruments at a price high enough to compensate for their risk taking.

Since longevity risk arises when the population on average lives longer than anticipated, parties such as pension funds, insurance companies, and governments will suffer losses from demographic change, while other parties such as pharmaceutical companies and medical equipment firms will enjoy gains. Thus, both parties are exposed to longevity risk, but in opposite directions. Demanders such as pension funds may lose from a faster-than-anticipated increase in longevity while gaining from a slower-than-anticipated increase in longevity. On the other hand, suppliers such as pharmaceutical companies have exactly the opposite payoff pattern.

For example, Hong Kong, China is rapidly aging. As a demander, it is exposed to aggregate longevity risk. A higher-than-expected annual survival rate for the 80-year old population will adversely affect the capital of Hong Kong, China's Mandatory Provident Fund (MPF), which ultimately harms the financial security of the elderly. On the other hand, the Philippines, with a relatively young population, relies on remittances from its workers abroad. Many of these workers specialize in caring for the elderly, including the elderly of Hong Kong, China. An unexpected longer survival rate for the elderly in Hong Kong, China increases the demand for caring services, which increases the demand for and incomes of Filipino caregivers working in Hong Kong, China. Therefore, the Government of the Philippines, as the supplier, can expect more remittances to be sent home, resulting in increased consumption and rising tax revenues. By the same token, the Philippines would suffer from lower-than-expected longevity among residents of Hong Kong, China.

A natural solution to hedge the risk of uncertain longevity is to trade with a counterparty having the opposite risk exposure. If the degree of risk aversion of both markets to their respective longevity exposure were the same, an arrangement could be made between the two counterparties via a swap of benefits. For instance, both parties would agree to an index that measures the survival rate of the 80-year-old cohort in Hong Kong, China as well as a benchmark level. Then, they enter a zero-swap transaction in which one party is compensated by the other party depending on whether the agreed index falls above or below the benchmark level.

Since both parties may have different degrees of risk aversion to their respective longevity exposure, an incentive that serves as an insurance premium could be provided to the supplier to facilitate an agreement. In the hypothetical deal between Hong Kong, China and the Philippines, Hong Kong, China could lower the long-term borrowing cost for the Government of the Philippines, the supplier, who is providing longevity insurance to the demander, the elderly of Hong Kong, China. Assuming that the MPF purchases a 10-year PHP-denominated government bond with a current yield of about 5.0%, the MPF could then offer a rebate of x% to the Government of the Philippines, lowering its cost of borrowing to (5.0–x)%.

During the implementation period, there would be two scenarios. When the survival rate index is higher than the benchmark, the Government of the Philippines will transfer y% of the annual income generated by Filipino caregivers in Hong Kong, China to the MPF. However, when the survival rate index is lower than the benchmark, the MPF will transfer an agreed amount, z, to the Government of the Philippines (**Figure B2.3**). The two parties will negotiate in advance to determine the values of x, y, and z. Given that the present yield on 10-year government bonds in Hong Kong, China is around 1.56%, which is considerably lower than the comparable rate of about 5.0% in the Philippines, this large

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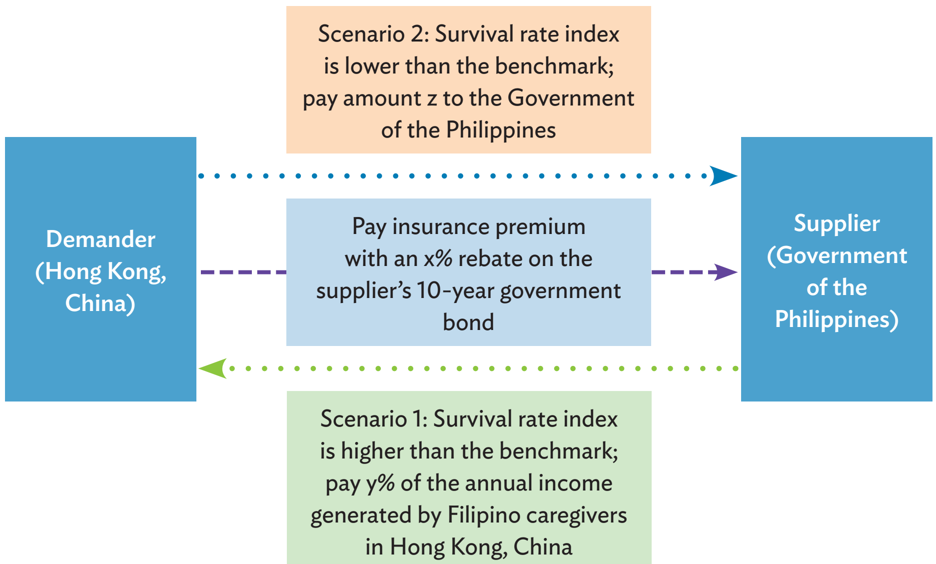
Box 2: Coping with Longevity Risk—A Conceptual Solution *continued*

Figure B2.3: Proposed Solution to Manage Longevity Risk—A Hypothetical Illustration



Source: Authors, based on research materials.

interest rate gap provides enough room for carrying out the envisioned transaction.[b]

The role of multilateral development banks

In the proposed solution, the existence of default risk could hamper a deal between the two parties. An intermediation that facilitates such transactions between the counterparties would help. Multilateral development banks such as the Asian Development Bank and World Bank could act as intermediaries to bring the counterparties together. In this hypothetical deal, the Asian Development Bank could purchase 10-year USD-denominated government bonds on the asset side of its balance sheet and simultaneously open a trust fund account on the liability side of its balance sheet to collect and disburse funds (to and from both sides) based on the predetermined scenarios. Multilateral development banks can thus effectively lower the default risk associated with such a transaction.

[b] While the deal hedges most of the longevity risk, some basis risk arises when the predetermined payments from the Government of the Philippines are insufficient to cover the increased costs from a survival rate that exceeds the benchmark rate in Hong Kong, China. The unhedged part of longevity risk exposure could be transferred, for a fee, to private entities that have more diversified positions and hedging strategies.