

ADB Working Paper Series on Regional Economic Integration



The Financial Crisis and Money Markets in Emerging Asia

Robert Rigg and Lotte Schou-Zibell

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Abstract

Asian money markets entered the financial crisis in better shape than markets in other regions due to a substantial build-up of savings and liquidity in their banking systems, as well as a greater domestic focus in most of the region's markets. However, despite the higher liquidity and lower levels of global integration, the effects of the crisis in Asia were severe and followed a similar path observed in international markets. The further development of money markets, particularly in less developed economies, will require policies and initiatives that add liquidity and depth to attract broader participation from both domestic and international investors—including regional cooperation, a robust regulatory architecture, and foreign competition to expedite the development of less developed money markets. Risk management and liquidity assumptions also need to be enhanced to establish buffers that will withstand more severe and prolonged external shocks and disruptions to external financing.

Keywords: Money market, money market participants, components of money markets, financial crisis

JEL Classification: F30, G00, G20, and O53

1. Introduction

Emerging Asian money markets remain largely underdeveloped compared with the mature markets of the United States (US) and Europe. Although this helped insulate the region from the most severe effects of the 2008/09 financial meltdown, critical lessons can be drawn on how to build efficiently integrated money markets that can withstand regulatory failures and structural flaws that continue to exist.¹

To strengthen emerging Asian money markets, policies should be tuned to ensure that model assumptions are given adequate consideration. They should be designed to allow for exogenous and domestic shocks. They need to consider market liquidity and the secured funding that is the foundation of risk management. They should also consider what kind of temporary guarantees on bank liabilities can boost money market trade, advance governance and risk management models, strengthen financial market infrastructure, and complement regulatory supervision.

This paper aims to describe how to do this. Section II outlines the current state of money markets in emerging East Asia. Section III gives a rundown of recent money market developments—why most of the region’s banks were less affected than their US or European counterparts. Section IV discusses the medium-to long-term challenges for money market participants, including how they can significantly shape future money market development in the region. Section V argues that government stimulus has created an unprecedented need for debt financing via government bond issuances. Section VI describes money market strengths and weaknesses within the region. Section VII explains that, despite the diversity among the regions money markets, there is a common architecture that can enhance individual market development. And section VIII offers some concluding remarks on policy options for emerging Asian money markets to emerge stronger out of the global financial turmoil.

2. Inside Money Markets

Liquid money markets are critical to financial stability as they provide market participants with a significant portion of their required funding. Money markets are integral to the financial infrastructure of industrial countries and are among the largest financial markets in the world. These markets serve as channels for the execution and transmission of monetary policy, and as trading venues for the shortest-term instruments that anchor the entire term structure of interest rates. Money markets also play an important role in the credit evaluation process and in large-value payments systems where trades are settled. The region’s markets range from the international money centers of Singapore and Hong Kong, China—where local currencies trade alongside foreign currencies in deep and liquid markets—to emerging regional markets that are more domestically focused and at different stages of deregulation and development.

¹ While information has been sourced from a variety of industry participants, official statistics, and referenced publications, the topic here is viewed through a broad prism of issues raised by the Bank for International Settlements (BIS). BIS. “Capital Flows and Emerging Market Economies.” Committee on the Global Financial System (CGFS) Papers No. 33 (January 2009).

Financial centers that have deep and liquid markets tend to be those with more developed financial systems that can accommodate the underlying needs of the real economy. Instead of banking systems catering mainly to trade-based commerce, financial markets have altered their focus and gravitated towards domestic investment flows, funds management, international capital flows, and risk mitigation. This change reflects the globalized nature of financial markets and the internationalization of financial opportunities and customer bases. The rapid growth of Islamic finance in response to the demand for financial products as measured by *shari'a*-compliant assets is a more recent example of regional demand fostering market developments.

Money markets are also central to capital allocation, the efficient distribution of liquidity among financial institutions, and the hedging of short-term risks. Modern day money markets can be defined as markets for deposits and short-term debt securities—such as bankers' acceptances; commercial paper; repurchase agreements (repos); negotiable certificates of deposit; and Treasury bills with a maturity of 1 year or less, and often 30 days or less. Money market securities are generally considered safe investments that return a relatively low interest rate for temporary cash storage or short-term tenure. Bid–ask spreads are also relatively narrow due to the large size and high liquidity of the market. Despite their shorter-dated focus, it is important to note that money markets are a vital component of the larger financial system and cannot be seen in isolation from longer-dated debt markets.

In addition to providing the clearing function for liquidity and currency exposure, money markets are the primary transmission mechanism for changes in central bank monetary policy aimed at the real economy. They act as an aggregator of liquidity and facilitator of spot- and short-dated exchanges. Policy changes are transmitted through interest rate movements, the issuance of government debt securities, repos, exchange rate intervention, the sterilization of foreign exchange (FX) intervention, and other open market activities that central banks use to change policy or smooth volatility.

Developed money markets also help facilitate modern financial systems by allocating resources to end users quickly and efficiently—whether they are borrowers and issuers, or lenders and investors. A properly functioning market has deep liquidity and a relatively free operating environment, allowing it to allocate resources more efficiently than thinner, more regulated markets that carry distortions. Money markets allocate financial resources and generate an efficient frontier for capital distribution in which a demand and supply equilibrium brings optimum returns for each level of risk across a broad range of maturities and instruments. Accomplishing this requires market depth and liquidity, multiple participants, free information flows, and supportive regulatory and legal frameworks. Most short-dated money markets provide good examples of why depth and liquidity are important in re-channeling excess liquidity efficiently throughout the system.

While the development of individual modern money markets reflect the underlying economy it services, they generally consist of a common set of components including (i) the interbank market, (ii) the securities market, (iii) repurchase agreement (repo) and swap markets, (iv) derivatives, and (v) asset-backed traded securities.

2.1 Interbank Trading

The market for interbank trading is the largest and most visible component of money markets. It is also an extremely efficient tool for managing liquidity and transmitting policy adjustments. Changes in price are transmitted instantly via banks dealing with each other in a less credit-constricted environment compared to dealings with the nonbank and commercial sectors. At the onset of the current crisis, the interbank market reacted by limiting dealing lines with other banks to reduce exposure to institutions whose creditworthiness was suddenly in doubt. One interesting aspect of the crisis was that credit concerns surrounded not only price, but also volume, as credit and dealing lines were reduced or withdrawn. This affected access to United States (US) dollars and other currency funding by banks that had relied on short-dated foreign exchange (FX) swaps and uncommitted money market loans to generate funding to support longer-term assets, which were now less liquid and of a longer duration than the underlying funding. The reduced credit and dealing capacity put additional strain on a market already suffering from dollar illiquidity as short-term loans and swaps needed to be rolled over to generate the required longer-dated funding.

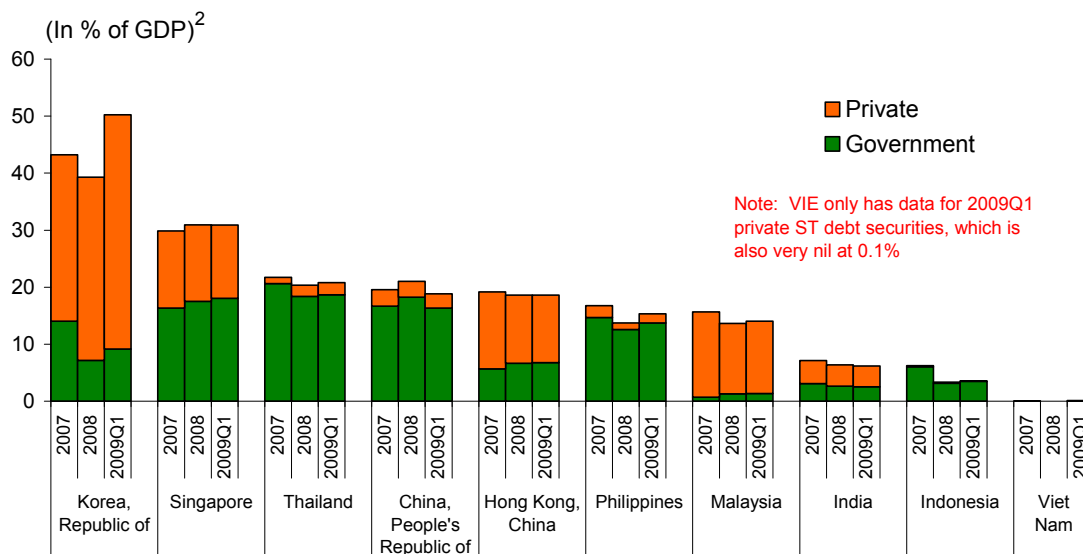
Since the most immediate crisis effect came via foreign currency markets, domestic currency markets were less impacted. The large liquidity pool was swelled by additional funds diverted to the relative safety of short-term deposits and by central bank open market operations designed to inject further liquidity into the system. The interbank market—being the point of price discovery—reacted quickly to the stress with overnight index swap (OIS) spreads blowing out dramatically for both the US dollar and regional currencies. In the Eurodollar market, the London Interbank Offered Rate (LIBOR)–OIS spread, having traditionally traded around 10 basis points, moved to an all-time high of 364 basis points in October 2008, before dropping back to around 45 basis points by June 2009.

2.2 Short-Term Securities: Certificates of Deposit, Commercial Paper, Treasury Bills, Promissory Notes, and Bills of Exchange

Regional short-term securities markets, while being normally dominated by treasury bills, also incorporate a range of bank certificates of deposit (CDs) and commercial paper (Figure 1). These securities are held by money markets as tradable assets and a liquidity buffer, and for access to central bank funding through open market operations. The commercial paper markets have been growing in importance as banks sought alternatives to vanilla lending, which uses up both balance sheet capacity and capital. Also, from the issuer's perspective, the commercial paper market offers the advantage of more competitive pricing as the bank-to-borrower "one-on-one" status is replaced with a broader relationship with the marketplace—as multiple market participants trade or warehouse an issuer's paper. With the onset of the global financial crisis, money markets re-priced risk amid a liquidity shortage that led to a two-tier reaction. On one hand, risk aversion—and the need to hold highly liquid assets—had the effect of increasing demand for treasury bills while simultaneously reducing demand and liquidity for non-government paper. This was particularly true for commercial paper, which caused spreads to widen significantly. The risk aversion seen in cash money markets spread through securities markets, which limited the liquidity of commercial debt. This

situation was magnified in longer-dated international capital markets in which even highly-rated issuers could not raise funds and, in many cases, had to ultimately rely on a government guarantee in order to get an issue placed with investors.

Figure 1: Outstanding Short-Term Debt Securities¹



¹ Debt securities with remaining maturity up to one year, including those issued in domestic and international markets. Private sector debt covers securities issued by financial institutions and the corporate sector. Domestic securities for 2008 are as of September 2008.

² Fiscal Year (FY) 2008 GDP data for India is a *World Economic Outlook* estimate, for the Republic of Korea the estimate is taken from published FY budget ratios.

Source:

OREI staff calculations based on data from the Bank for International Settlements (BIS); CEIC; *World Economic Outlook* October 2008, International Monetary Fund (IMF). *World Economic Update*, April 2009.

In the lead up to the crisis, the Republic of Korea (Korea) had approximately 37% of its gross domestic product (GDP) equivalent issued in short-dated securities, with the majority being private sector paper and showing a maturity profile at the basis of the problems that followed the worst of the liquidity squeeze when USD-denominated paper matured amid the meltdown. Singapore and Hong Kong, China also entered the period with relatively high private issuance as a percentage of total issuance, reflecting their position as international money centers. Malaysia's high private issuance was, on the other hand, primarily domestically based and denominated in local currency (LCY). A high ratio of government issuances over private paper could be seen in the People's Republic of China, Indonesia, the Philippines, and Thailand, which reflects the relative underdevelopment of their respective commercial paper markets and the dominance of government securities.

With the twin effects of lower GDP growth and government fiscal stimulus, the expected impact of these two events will likely show (i) a marked increase in government issuance

relative to both GDP and private securities, and (ii) an absolute contraction in both onshore and offshore issuances by the private sector as markets contract.

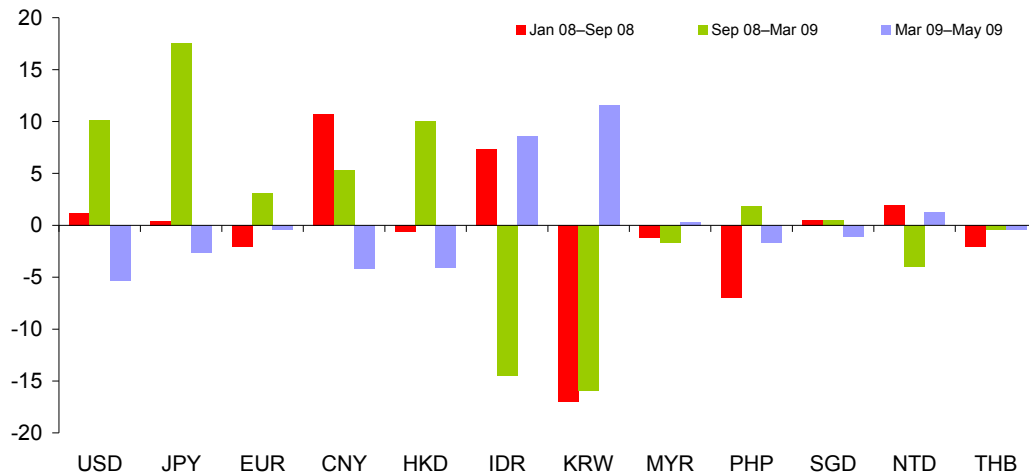
2.3 Repo and Foreign Exchange Swap Markets

While interbank cash markets are largely uncollateralized, repo and FX swap markets are collateralized. A repo transaction involves an underlying instrument as the saleable security. An FX swap is effectively collateralized by the second currency leg of the transaction. The repo² market's role expanded considerably as the current financial crisis unfolded, with central bank operations in the open market allowing a wider group of securities as acceptable for repurchase agreements. This followed moves by the US Federal Reserve in which it accepted a wider range of securities for open market transactions that would previously have rated below the acceptable credit standing for such transactions.

The repo market is often the primary means for central banks to inject liquidity into financial systems by adding flexibility to the marketplace in times of crisis. The development of interbank FX swap markets in emerging Asia has been limited in some economies by capital controls and restrictions on non-residents. In other cases, however, central banks have used swaps as a means of sterilizing market intervention in FX spot markets or injecting additional liquidity. In the more developed markets of Singapore and Hong Kong, China, the swap markets for foreign currencies are both broad based and liquid. Arbitrage between money markets and FX swap markets ensures that markets are aligned. The use of swap and repo markets to inject liquidity greatly helped local markets cope with the stress caused by the credit freeze.

² The Fed for example uses repurchase agreements, also called "RPs" or "repos", to make collateralized loans to primary dealers. In a reverse repo or "RRP", the Fed borrows money from primary dealers. The typical term of these operations is overnight, but the Fed can conduct these operations with terms out to 65 business days. The Fed uses these two types of transactions to offset temporary swings in bank reserves; a repo temporarily adds reserve balances to the banking system, while reverse repos temporarily drains balances from the system. (source: Federal Reserve Bank of New York)

Figure 2: Changes in REER¹ of Asian Currencies (%)



Notes:

¹ REER = Real effective exchange rate.

USD= US dollar; JPY= Japanese yen; EUR= euro; CNY= People's Republic of China (PRC) yuan; HKD= Hong Kong dollar; IDR= Indonesian rupiah; KRW= Korean won; MYR= Malaysian ringgit; PHP= Philippine peso; SGD= Singapore dollar; NTD= New Taiwan dollar; THB= Thai baht.

Source: OREI staff calculations based on data from the Bank for International Settlements.

The most substantial swap activity was noted in Hong Kong, China and—to a lesser degree— Singapore, while being virtually non-existent in other markets (Table 1). As Table 1 suggests, forward market activity is generally not well-developed. The standout amount of forward activity in Korea in 2007 largely reflected export sales. In addition, spot transactions reflect the activities of financial centers such as Singapore and Hong Kong, China in the global marketplace.

**Table 1: Transactions of Asian Currencies
(Daily Averages, US\$ Hundred Million)**

| Economy | FX Swap | | Forwards | | Spot | |
|-----------------------------|------------|------------|------------|------------|------------|------------|
| | April 2007 | April 2008 | April 2007 | April 2008 | April 2007 | April 2008 |
| China, People's Republic of | 0.0 | 0.3 | 3.4 | 4.8 | 0.1 | 0.0 |
| Hong Kong, China | 31.8 | 36.7 | 3.3 | 1.2 | 12.9 | 10.9 |
| India | 0.0 | 0.1 | 4.5 | 2.6 | 0.8 | 0.1 |
| Indonesia | 0.1 | 0.1 | 0.6 | 1.3 | 0.1 | 0.0 |
| Korea, Republic of | 0.5 | 4.2 | 13.1 | 4.8 | 1.8 | 2.6 |
| Malaysia | 0.0 | 0.4 | 1.7 | 2.9 | 0.6 | 0.0 |
| Philippines | 0.0 | 0.1 | 0.9 | 1.2 | 0.1 | 0.0 |
| Singapore | 4.6 | 13.4 | 1.3 | 1.2 | 5.5 | 5.2 |
| Thailand | 0.8 | 2.9 | 0.3 | 0.1 | 0.6 | 0.6 |
| Viet Nam | ... | ... | ... | ... | ... | ... |

... = no available data.

Source: Results of Turnover Survey of Tokyo FX Market, Tokyo Foreign Exchange Market Committee. 26 July 2007 and 22 July 2008 reports.

2.4 Derivatives Markets

Outside Singapore and Hong Kong, China, which both have international derivative markets, the main domestic-focused derivative markets are in India, Korea, and Malaysia. Exchange-traded and over-the-counter (OTC) derivative markets elsewhere in the region are relatively small and undeveloped, although interest rate swaps (IRS) are present in Viet Nam. Meanwhile, forward rate agreements, IRS, futures, and options are not present in many emerging Asian markets. However, the importance of these instruments in offsetting exposure to market risk needs to be dealt with as risk management systems develop that require offsetting derivative contracts to mitigate risk exposure. OTC options, as opposed to exchange-traded instruments, represent the main activity in the region for LCY derivatives. Exchange-traded interest rate futures are traded in Hong Kong, China; Malaysia; and Singapore; but only Malaysia has exchange-traded interest rates exceeding those traded through OTC markets and forward rate agreements.³

³ On August 11, the Treasury Department released the Over-the-Counter Derivatives Markets Act of 2009 ("OCDMA"), its legislative proposal to regulate the over-the-counter (OTC) derivatives industry. The proposed legislation provides an approach to comprehensively regulating OTC derivative transactions and the entities that enter into OTC derivatives transactions. Through its proposal, the Treasury Department is recommending the repeal of many provisions of the Commodity Futures Modernization Act ("CFMA"), which was adopted in 2000. (Source: Harvard Law School Forum on Corporate Governance and Financial Regulation, 1 September 2009).

2.5 Asset-backed Commercial Paper Markets

Securitized debt instruments underpinned the US subprime mortgage crisis, where loans were re-engineered into highly-rated debt securities and then on-sold to investors through what came to be known as the originate-to-distribute model. Investors primarily relied on credit ratings assigned by ratings agencies. However, confidence eroded along with investor interest, forcing financial institutions to warehouse securities meant for distribution. This added to the drain on market liquidity as these institutions scrambled to fund the securities. More liquidity stress came just as concerns spread to other types of structured debt, which in turn further exacerbated the liquidity problem and led to a vicious cycle. In addition to liquidity strains, a loss of confidence led to ratings downgrades for many forms of structured debt and asset-backed commercial paper (ABCP), leaving them as unacceptable securities for collateralized money market transactions. This reinforced the downward spiral in value; fed the loop of liquidity strain, asset depreciation, and distressed sales or mark-to-market revaluations; and further eroded liquidity and confidence.

However, emerging Asia's domestic money markets were largely insulated from the direct fallout of structured- and asset-backed securities. The presence of undeveloped markets in securitized debt in regional currencies was one reason, while another was the twin focus on prime, or government, debt and the shorter-term horizon of money market investors.

Malaysia and Hong Kong, China have secondary mortgage markets. While the underlying loans supporting the market in no way resembled their US counterparts in either creditworthiness or volume, they were affected by events in the US and the subsequent global meltdown. At the same time, other countries such as Thailand are examining ways of utilizing ABCP to provide deeper liquidity as well as more competitive pricing. This approach holds many opportunities for emerging Asian markets to use the benefits of securitization to add liquidity and mobilize funding for numerous types of ABCP. The current crisis should, however, not detract from the recognized importance of this market in freeing up balance sheets and allowing previous illiquid assets to be securitized and traded. A properly constructed market with creditworthy securities underpinning traded paper will offer many opportunities for enhanced loan origination and investment options for fund managers and investors, both locally and globally.

3. Recent Money Market Developments—Financial System Liquidity

Despite some improvement, the relative underdevelopment of money markets in emerging Asia helped insulate the region from the core financial turmoil that rapidly spread beyond the United States (US) subprime market. The liquidity crisis—coming on top of solvency concerns for many financial institutions—led to a severe distortion in the global Eurodollar market. US dollar liquidity dried up and a credit crunch effectively closed most international debt markets for all but sovereign guaranteed issuers. This led to an additional credit-driven contraction in the real economy as the downturn reduced

consumption, production, investment, and expenditures. In an export-driven region such as emerging Asia, the crisis spillover came mainly via the external account as exports and investment flows collapsed alongside domestic demand.

Regionally, most banks were less affected than their North American and European counterparts. This reduced impact is in part due to the high savings of the household sector and large accumulated foreign reserves. While debt transmits a loss of confidence quickly and efficiently, high household and national savings provided a degree of financial insulation. To some extent, many of the less-developed Asian money markets were initially less impacted by dollar illiquidity precisely because of the domestic nature of their markets and high savings ratios. However, the money markets of Singapore and Hong Kong, China—as well as the Republic of Korea (Korea)—were immediately impacted as US dollars were suddenly withdrawn, leaving acute shortages for Eurodollar funding.

Notwithstanding the relatively better position of the region's markets, the crisis effects in emerging East Asian markets were significant and followed a similar path to that observed in international markets. The initial impact was characterized by a seizing-up of credit and settlement lines within the interbank market as banks withdrew limits amid uncertainty over the extent of the crisis and the financial strength of their peers. With the banking system dominated by international banks operating across most markets, the impact was instantaneous and felt by branches and subsidiaries operating in all markets, and not just those at the epicenter of the meltdown. In essence, head office decisions were made with global implications for money markets, including emerging Asian markets. Local banks, in turn, reduced or cut limits for global banks in response to this uncertainty, which exacerbated US dollar illiquidity.

Credit lines and uncommitted facilities were withdrawn from other market users, including the corporate sector, as banks hoarded liquidity and reassessed exposures. International debt markets were also impacted as underwriters and investors reacted to the meltdown. Planned issues were cancelled and the corporate sector, which had grown accustomed to easy credit, had to look for alternative sources of finance. This would have an enormous impact on a number of large multinational companies around the globe as their funding capability from both debt and equity markets dried up simultaneously. The withdrawal of credit ultimately led to the collapse or restructuring of many large companies, and was transmitted back to the markets in the form of falling values for collateralized debt obligations (CDOs) and sharply rising premiums for credit default swaps (CDS), which had both been used extensively in structured debt facilities that had been securitized and traded back into the markets.

The household sector responded in a similar way by withdrawing funds from both equity and debt markets. The investment freeze that followed saw equity markets fall as both institutional and retail funds withdrew, while bank deposits rose as a safe haven for liquidity. This safe haven status given to bank deposits was further enhanced in some instances with deposit guarantees. As confidence collapsed, a flight to quality ensued in the form of a massive inflow of international funds into US Treasuries, causing both the US dollar to rise and bond yields to fall to record levels as funds ignored diminishing returns. Similar effects were felt across the globe particularly in Japan where the

unwinding of the Yen carry trade by international hedge funds and speculators, combined with liquidation of the household sector's higher yielding foreign investments, saw funds repatriated at a rapid rate forcing the yen higher and crystallizing losses on the foreign investments”

With the global financial meltdown putting severe stress on asset values, the balance sheets of many banks came under pressure as writedowns decimated their capital bases. This ultimately led to partial and, in some cases, full effective nationalization of banks as well as a refocusing of strategy away from foreign markets back to respective domestic operational bases. With this pullback still unfolding, the structure of some regional money markets is likely to change with regard to the composition of large international banks and the downsizing of their emerging market risk appetites.

In a region heavily dependent on international trade, the impact of the crisis on trade finance was significant. The financial crisis caused a severe contraction in international trade in the period following the Lehman Brothers collapse. The fall in trade exceeded what would normally be expected by a drop in demand alone. Studies suggest that the fall also reflected a disruption to financial intermediation in trade finance as the price of finance rose and its availability fell.⁴ The price of trade finance increased sharply for letters of credit and short- to medium-term lending facilities in which the goods traded serve as collateral. While the increased cost of funds to the banking sector was largely attributable to higher rates, higher internal and expected regulatory capital requirements also may have affected pricing. Counterparty risk became another inhibiting factor alongside similar concerns in the interbank market as banks reviewed their criteria for dealing with other banks.

As the global economic contraction has reduced trade, an effective response may be increased emphasis on intra-regional trade through trade financing supported by governments and multilateral organizations. With the region heavily dependent on trade and a large proportion of that trade involving small- and medium-sized enterprises (SMEs), the free availability of trade finance will be crucial to economic recovery. SMEs, which are more heavily impacted by credit constraints than their larger counterparts, represent the sector that would benefit most from coordinated regional assistance.

Box 1: Fed to the Rescue: Initial Reactions

The United States (US) Federal Reserve's (Fed) early response to the financial crisis showed the importance of money markets as the primary channel providing liquidity to the real economy. One of the hallmarks of money market funds is their ability to maintain stable net asset values—typically at USD1 per share.⁵ As the primary supplier of credit and short-term debt, any concerns regarding money market liquidity will quickly translate into a reduction in credit provision across the broader spectrum.

The causes of the financial crisis have been attributed to many factors. But together they resulted in panicked markets, extreme equity market volatility, plunging prices across most

⁴ International Monetary Fund (IMF). March 2009. Finance and Development.

⁵ Speech by U.S. Securities and Exchange Commissioner Luis A. Aguilar. Strengthening the Money Market Framework with Investors in Mind. 24 June 2009.

other asset classes, and essentially froze credit and securitization markets. Money markets were suddenly and deeply hit by a rapid succession of events. Just prior to 15 September 2008, money market assets in the US totaled USD3.5 trillion.⁶ That week saw the sale of Merrill Lynch to Bank of America, Lehman Brothers' bankruptcy, and the Fed bailout of American International Group, Inc. (AIG).⁷ Meanwhile, Bear Stearns had already filed for bankruptcy in March 2008.

The nature and scope of the crisis required several concerted and parallel policy responses—one of which was to provide central bank liquidity to ensure money markets could keep functioning. But there were "unintended consequences"⁸ of what otherwise seemed sensible policy implementation. After the financial rug was pulled out from under mortgage-backed securities, the loss of confidence quickly spread to other asset-backed securities. Money market liquidity became tight as issuers were forced to warehouse increasing amounts of loans that had previously been earmarked for securitization and sale. Thus, money market participants were forced to retain increasing amounts of securities on their balance sheets as most asset-backed commercial paper markets grew increasingly impaired.

This was critically important to money markets as vast sums were falling due each day, in effect causing almost instant contagion when liquidity faltered. The spread between interest rates on commercial paper and Treasury bills spiked after the failure of Lehman Brothers. Adding to the pressure was a money market fund that faced defaults on its Lehman Brothers' commercial paper investments—losses of such magnitude that the fund closed and paid its investors below the standard USD1 per share par value, thus "breaking the buck". Institutional investors then began redeeming shares of money market funds invested in commercial paper. To meet the withdrawals, the funds had to sell their paper holdings into a thin market. This caused commercial paper rate spreads to widen to extreme levels.

To prevent a breakdown of the commercial paper market, initial policies aimed to support liquidity in money market mutual funds. The Fed encouraged banks to use its discount window to finance loans to money market funds that were facing redemptions, while the US Treasury Department extended deposit insurance to the funds to calm investor concern that other funds would "break the buck". But risk aversion surged following the Lehman Brothers' collapse and liquidity premiums rose, leading to a sharp widening of the spread between commercial paper and Treasury bill interest rates.

It became almost impossible for even highly rated companies to continue issuing new commercial paper. The result was a sharp fall in the amount of commercial paper outstanding. As a next policy step, the Fed allowed money market mutual funds to borrow collateralized discount loans from a new money market investor funding facility. This helped prevent a flood of money market fund redemptions that risked setting off a disorderly sale of commercial paper in an already unstable market.

Investors were, however, still uncertain whether companies would be able to issue new paper to repay maturing debt, especially given the risk aversion of other investors. Once again to calm the market, the Fed announced it would fund purchases of top-rated commercial paper via a new facility capitalized by the Treasury—the commercial paper funding facility.

⁶ George Hagerman, Cachematrix Holdings, LLC. Money Market Funds: The Impact of the Financial Crisis. 29 June, 2009.

⁷ Ibid.

⁸ Barry Eichengreen. Anatomy of the Financial Crisis. 23 September 2008.

Since October 2008, commercial paper lending has revived, and spreads between commercial paper and Treasury bills with comparable maturities have narrowed. Steps to bolster liquidity in related markets have also contributed to the improved functioning of the commercial paper market.

Given the events of the of the last year and the continuing economic and financial market turmoil, the US Securities and Exchange Commission (SEC)—responsible for regulating money market funds—has proposed regulatory changes aimed at increasing the resilience of money market funds to market disruptions.

The broad-based amendments are designed to:

- improve portfolio credit quality,
- limit portfolio weighted average maturity,
- enhance portfolio liquidity,
- employ stress tests, and
- provide enhanced disclosure.

3.1 Indicators of Market Stress and Collapse of Confidence

While local currency (LCY) money books dominated the less developed markets, US dollar shortages impacted the more developed markets as the supply of dollars evaporated. The extent and severity of this market stress can be gauged from the LIBOR–OIS spread (London Interbank Offered Rate–overnight indexed swaps), which is widely regarded as a leading indicator. During the last quarter of 2008, the wide LIBOR–OIS spread reflected a near total collapse in confidence in the interbank market. However, more recent movements in 2009 have seen an easing in conditions from the worst of the crisis. Following the collapse of Lehman Brothers, the spread widened to 364 basis points from its pre-crisis range of around 10 bps. The widening resulted from uncertainty and elevated concerns about credit risks as banks reduced lending to each other, with LIBOR rising sharply in response to these concerns. The spread has contracted significantly over the course of 2009 as confidence gradually returned to interbank lending as measured by LIBOR. By the end of June, the LIBOR–OIS spread had narrowed back to around 45 basis points, which is its lowest level since February 2008. The 3-month LIBOR rate fell steadily from 4.82% in October 2008 to 1.0% in April 2009, and reached 0.595% at the end of June. In part, this fall measured receding market concerns resulting from the US Federal Reserve’s stress testing of US banks, which revealed no major shocks and mapped out an achievable path to bank recapitalization.

With the LIBOR representing a benchmark rate for USD360 trillion of financial products, the steady fall in this benchmark has been welcomed by the market as conditions have eased and confidence returned. While the LIBOR–OIS spread has been recognized as a primary indicator of market stress, movements in the spread can also reflect other factors such as decreased liquidity or expected future rate increases. In addition to positioning for or against expected rate moves in either leg of the spread, OIS can be used to change the interest rate or liquidity profile without an underlying physical transaction and with minimal credit usage, except for counterparty risk on the swap. An

expected rate movement would prompt the interest rate profile of a money market book to be altered. In the case of an expected rate increase, liabilities would be lengthened; or, alternatively, the maturity of assets would be lengthened in the expectation of a rate fall. OIS swaps can provide an alternative to a change in the underlying physical book's profile without the maturity profile changing. The swap itself does not involve an exchange of principal and is, therefore, settled on a net basis.

In the case of an expected fall in a policy rate, a money market book could enter a swap transaction to receive the longer-dated coupon (LIBOR) and pay the average of the overnight rate for the duration of the swap, effectively generating a rate profile identical to that of generating a longer-dated asset (loan) and funding it at the cheaper overnight rate (deposit). If the expected rate fall were to occur during the life of the swap, the payer of the overnight rate would pick up this benefit in terms of a "cheaper" deposit rate. In the above examples, the interest rate profile has been altered but the underlying physical profile has not changed since there are no additional assets or liabilities.

OIS swaps can also be used to alter a liquidity profile without the corresponding interest rate penalty. In the event that overnight liabilities are at maximum internal tolerances for liquidity purposes, the book can raise term funds from the market and repay overnight deposits to improve their liquidity position. To negate the higher cost of the term funding, the bank would enter a swap in order to receive the longer coupon, which is basically equivalent to the expense it was paying on the longer-dated deposit, and pay away the overnight rate. By combining the two transactions, the liquidity position is altered by the addition of increased term deposits, while the interest rate profile, however, remains unchanged.

LIBOR averages, which have been interpreted as an additional indicator of individual banks willingness to lend, suggest that the fall in the LIBOR masks a growing gap between the range of rates that the biggest banks charge each other, i.e. the gap between the highest and lowest rates banks claim they charge each other when compiling LIBOR averages for each maturity. As of April 2009, the average LIBOR gap between the highest and lowest rates quoted by the 16 contributing banks averaged 7.5 basis points—up from 4.9 basis points in April 2009 and 1.5 basis points prior to the collapse of Lehman Brothers in September 2008. The wider dispersion of quotes is one reflection of individual banks actual willingness and ability to lend. However, a fall in the LIBOR can also be influenced by increased deposits, reducing demand for interbank funding and reflecting better liquidity conditions rather than just an increased willingness on the part of banks to lend to one another.

In Asia, individual market stress varied substantially given the diverse levels of market integration and development, differences in banking infrastructure, and a range of domestic factors—including a structural funding flaw in the case of Korea. The financial instruments utilized in each market have, however, largely been the same, albeit with differing levels of importance and at different levels of sophistication. While authorities lowered interest rates and injected liquidity in response to the financial crisis and strains on US dollar liquidity, the range of outcomes and immediate effects were quite diverse.⁹ Year-on-year growth in the stock of treasury bills and central bank bills, for example, rose in 1Q2009 in several of the regions' markets as central banks and monetary

⁹ ADB. 2009. Asia Bond Monitor Summer Issue. Manila.

authorities aggressively participated in the issuance of bills. The value of LCY treasury bills reached USD138.3 billion (up 9.3% q-o-q on an LCY basis), while central bank bills were recorded at about USD449.6 billion (up 5.0% q-o-q on an LCY basis) at the end of 1Q2009. The stock of treasury bonds and central bank bonds also declined modestly in 1Q2009, resulting in a slight rise of the bills-to-bonds ratios in most markets in 1Q2009 from 4Q2008 (Table 2).

Table 2: Government Bills-to-Bonds Ratios of Emerging East Asian Local Currency Bond Markets

| | 1Q08 | | 4Q08 | | 1Q09 | | Government Bills-to-Bonds Ratio | | Growth Rate (LCY Base %) | | Growth Rate (USD Base %) | |
|--------------------------|----------------------|---------|----------------------|---------|----------------------|---------|---------------------------------|------|--------------------------|-------|--------------------------|--------|
| | Amount (USD Billion) | % Share | Amount (USD Billion) | % Share | Amount (USD Billion) | % Share | 4Q08 | 1Q09 | Q-o-Q | Y-o-Y | Q-o-Q | Y-o-Y |
| Total Emerging East Asia | | | | | | | | | | | | |
| Total | 2,016.0 | 100.0 | 2,091.4 | 100.0 | 2,033.7 | 100.0 | | | (1.0) | 8.0 | (2.8) | 0.9 |
| Treasury Bills | 103.1 | 5.1 | 128.5 | 6.1 | 138.3 | 6.8 | 0.08 | 0.10 | 9.3 | 40.0 | 7.6 | 34.1 |
| Central Bank Bills | 405.9 | 20.1 | 431.4 | 20.6 | 449.6 | 22.1 | 0.28 | 0.31 | 5.0 | 14.1 | 4.2 | 10.8 |
| Bonds | 1,507.0 | 74.8 | 1,531.5 | 73.2 | 1,445.9 | 71.1 | | | (3.5) | 4.0 | (5.6) | (4.1) |
| Less PRC | | | | | | | | | | | | |
| Total | 831.2 | 100.0 | 672.1 | 100.0 | 680.9 | 100.0 | | | 7.0 | 2.1 | 1.3 | (18.1) |
| Treasury Bills | 51.0 | 6.1 | 46.3 | 6.9 | 53.3 | 7.8 | 0.08 | 0.10 | 19.9 | 17.8 | 15.1 | 4.6 |
| Central Bank Bills | 118.6 | 14.3 | 77.1 | 11.5 | 96.2 | 14.1 | 0.14 | 0.18 | 29.2 | (3.0) | 24.7 | (18.9) |
| Bonds | 661.6 | 79.6 | 548.7 | 81.6 | 531.4 | 78.0 | | | 2.7 | 1.7 | (3.2) | (19.7) |
| Japan | | | | | | | | | | | | |
| Total | 6,821.1 | 100.0 | 7,473.2 | 100.0 | 6,813.6 | 100.0 | | | (0.2) | (0.6) | (8.8) | (0.1) |
| Treasury Bills | 228.3 | 3.3 | 188.3 | 2.5 | 211.4 | 3.1 | 0.03 | 0.03 | 22.8 | (7.9) | 12.2 | (7.4) |
| Central Bank Bills | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 |
| Bonds | 6,592.8 | 96.7 | 7,284.9 | 97.5 | 6,602.3 | 96.9 | | | (0.8) | (0.4) | (9.4) | 0.1 |

Notes:

- 1 Bloomberg LP end-of-period LCY-USD rates are used.
- 2 Growth rates are calculated from LCY base and do not include currency effects.
- 3 Total Emerging East Asia growth figures are based on end-March 2009 currency exchange rates and do not include currency effects.
- 4 Total figures per market refer to bills and bonds issued by the central government and the central bank. It excludes bonds issued by policy banks and state-owned enterprises. Bills are defined as securities with original maturities of less than one year.

Source:

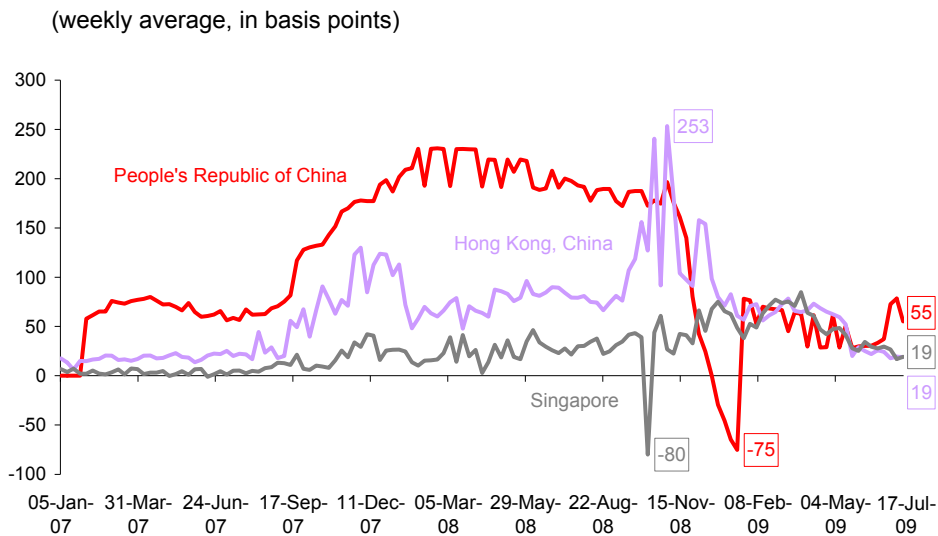
People's Republic of China (www.chinabond.com.cn); Hong Kong, China (Hong Kong Monetary Authority); Indonesia (Indonesia Stock Exchange and Bank Indonesia); Republic of Korea (Bloomberg LP); Malaysia (Bank Negara Malaysia); Philippines (Bureau of the Treasury); Singapore (Monetary Authority of Singapore and Bloomberg LP); Thailand (Bloomberg LP); Viet Nam (Bloomberg LP); and Japan (Japan Securities Dealers Association).

3.2 The Global Financial Crisis and some Country Specific Ramifications for Individual Money Markets

The wide diversity in domestic financial market development has led to a diverse range of crisis impacts across the region. Nonetheless, money markets in the region experienced some degree of dislocation. Those markets with a low level of global integration were relatively less affected than those with a higher degree.

Money markets in the People's Republic of China (PRC) were liberalized at a slower pace than markets in many other economies in the region. Reforms in the PRC were implemented under a “controlled financial innovation” model and within a regulatory framework implemented by the Peoples Bank of China (PBOC). With recent banking system reforms, state-owned banks have been recapitalized, foreign bank access has increased, and rules governing securities trading and ownership have been changed. Due to a greater domestic focus, PRC money markets have been less affected by the crisis than their more integrated counterparts such as Hong Kong, China. For example, the basis swap curves for the PRC; Hong Kong, China; and Singapore measure the 3-month interbank offer rate less the overnight index swap (OIS) rate and show the immediate market impact of the Lehman Brothers collapse in 2008 (Figure 3a). These spreads are regarded as a measure of market stress and show elevated and rising stress levels in both Hong Kong and Singapore dollars. However, they also show sharply falling spreads in the PRC, with its less integrated and more controlled market for official rates.

Figure 3a: Basis Swap Spreads¹

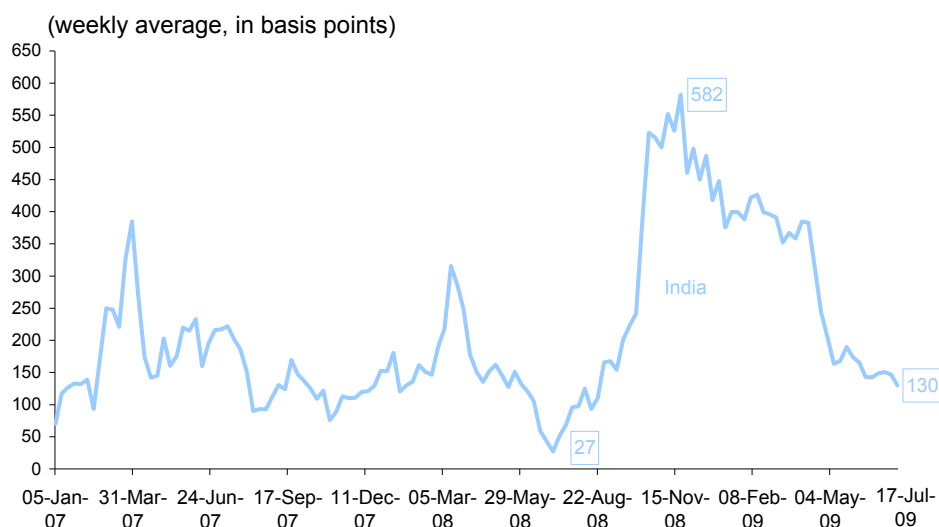


¹ 3-month interbank offer rate minus 3-month overnight index swap rate.

Source: OREI staff calculations based on Bloomberg data.

India's money markets and financial system have been undergoing a period of liberalization since the 1990s, with private banking growing strongly at the expense of the state-owned and -controlled commercial banks. Money markets have developed a wide range of securities that traded in relatively large, liquid markets. With the onset of the global crisis, the established trend toward private commercial banks and market innovation reversed under the wholesale risk retreat. Risk aversion and worries over credit stress flowed through to the Indian TED spread—the difference between the 3-month Mumbai interbank offer rate and the yield on 3-month treasury bills—which rose rapidly and remained relatively elevated despite strong intervention by the central bank to lower rates and inject liquidity. Before easing, the Indian basis spread rose dramatically from a level of around 100 basis points in June 2008 to a high of around 550 basis points by October 2008 (Figure 3b). The stress in the Indian market was exacerbated by the extreme risk aversion of investors and institutions as the impact of the crisis unfolded. This coincided with the transfer of activity back to the government-owned banking sector.

Figure 3b: Basis Swap Spreads¹



¹ Three-month interbank offer rate minus three-month overnight index swap rate.

Source: OREI staff calculations based on Bloomberg data.

Indonesia's market comprises a large number of smaller banks and was forced to maintain a relatively high interest rate structure by Bank Indonesia, which was concerned with currency depreciation and capital flight. In addition, a relatively high and growing loan-to-deposit ratio in the banking system meant that the impact on liquidity was quite severe, notwithstanding central bank efforts to inject liquidity through the repo window as well as arrange currency swaps with Japan and the Republic of Korea (Korea), and most recently, the PRC.

Korea was severely hit by a US dollar withdrawal since its money markets were heavy users of the shorter-dated FX swaps and cross currency swaps that funded strong domestic credit growth. One major cause of the outflow and transmission of US dollar

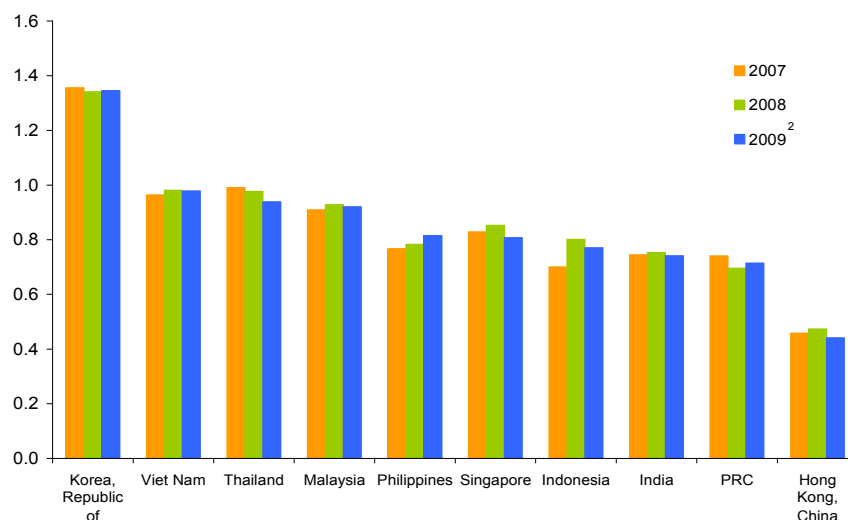
shortages to the domestic market was an arbitrage opportunity that allowed (mainly) foreign banks and international investors—including hedge funds—to swap short-dated US dollar loans into Korean won at levels substantially below domestic interest rates, and make substantial purchases of government paper and bank certificates of deposit (CDs). This arbitrage resulted from heavy forward sales of US dollars as major Korean exporters sought to lock in a forward rate, thereby providing an opportunity to generate won at effective interest rates well below those available in the domestic market.¹⁰ This artificial distortion was felt as yields on short-dated paper fell with arbitrage purchases made prior to the crisis. As the crisis unfolded and dollar liquidity dried up, the arbitrage window closed and reversed, which resulted in won securities being sold. Yields subsequently rose when securities were rapidly offloaded to repay the US dollar loans made amid the crisis despite official policy initiatives to lower interest rates. At the end of 2008, Korea was the only listed country with a loan-to-deposit ratio greater than 1.0, reflecting excess credit growth over and above that funded by deposits (Figure 4). This is consistent with the scenario of much higher, private, short-term debt issuance to fund the gap. Hong Kong, China—with a loan-to-deposit ratio of around 0.50—shows the buildup of domestic liquidity as deposits exceeded loans and resulted in large securities holdings by the money market. While these figures reflect the period through late 2008, it could be expected that these ratios may have fallen further as deposit funds continued to flow to the banking system and loan activity was curtailed due to risk aversion.

Malaysia's banking and money markets emerged from the 1997/98 Asian financial crisis much stronger. With 90% of bank assets in local currency (LCY) rather than foreign-denominated assets, Malaysian markets have been better insulated from the global meltdown despite Malaysia being an open economy with significant exposure to falling commodity prices. The money market has recently seen significant growth in both short-dated money market deposits and retail bank deposits. This growth has occurred against a backdrop of rapidly falling interest rates—Bank Negara Malaysia eased its overnight interest rate from 3.5% in September 2008 to 2.0% in February 2009—and reductions in the statutory reserve requirement from 3.5% to 1.0%, effective 1 March 2009.

The Philippines has a well-developed money market and an excess of international interbank placements over its borrowings. However, a number of factors—including foreign portfolio outflows, a high inflation rate, and a fiscal deficit—combined to limit a policy response to the financial crisis. A widening of the rediscount window and interest rate reductions were the tools used to keep liquidity moving throughout the system to support economic activity.

Singapore and Hong Kong, China, with globally integrated markets and the presence of large foreign banks, both felt the immediate effects of the global crisis. The Monetary Authority of Singapore (MAS), for example, arranged currency swap lines with the US Federal Reserve to free US dollar liquidity locally. However, the domestic markets for both the Hong Kong and Singapore dollars were less affected than more internationally traded currencies.

¹⁰ McCauley and Zuckunft. 2008. Asian Banks and the International Interbank Market. BIS Quarterly Review. June 2008.

Figure 4: Loan-to-Deposits Ratios¹ (%)

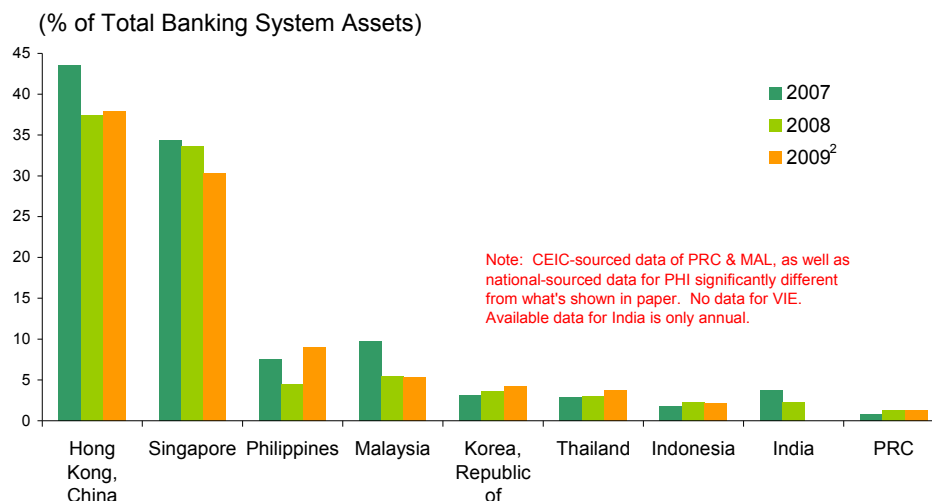
Covers loans to the private sector and non-financial institutions, and deposits (demand, time, savings, foreign currency, bond, and money market instruments) of banking institutions, deposit money banks, and other depository corporations of each country.

¹ Data for the Philippines as of May 2009; for People's Republic of China (PRC); Indonesia; Malaysia; and Thailand, as of Apr 2009; for Hong Kong, China; India; and Singapore as of Mar 2009; and for Republic of Korea and Viet Nam as of Feb 2009.

Source: OREI staff calculations based on data from *International Financial Statistics Online*, International Monetary Fund; and CEIC for the Philippines.

In the Singapore dollar market, a tightly regulated regime limited the fallout as the MAS acted in the open market to bring down domestic rates and provide liquidity. In the Hong Kong dollar market, massive liquidity had been built into the domestic currency, which limited the impact on the HKD-denominated balance sheets of local banks (due to very low loan-to-deposit ratios) and left banks with a large pool of liquid securities. Additionally, the Hong Kong Monetary Authority (HKMA) entered into a currency swap with PBOC for CNY200 billion to provide liquidity to mainland banks in Hong Kong, China, while simultaneously providing Hong Kong, China banks with liquidity in the PRC. Interbank claims in the region show the financial centers of Hong Kong, China and Singapore as having dramatically higher claims than their less integrated counterparts (Figure 5). This situation reflects liquidity in the system and the nature of the trend towards financial assets—the placement of excess funds with banks rather than with the corporate sector—as well as the safe haven status of both financial centers. In addition, it is likely that the relative size of the interbank claims in each market will have increased throughout 2009 as credit remains hoarded in the banking system and lending is restricted in the non-bank and corporate sectors.

Figure 5: Interbank Claims¹



PRC = People's Republic of China.

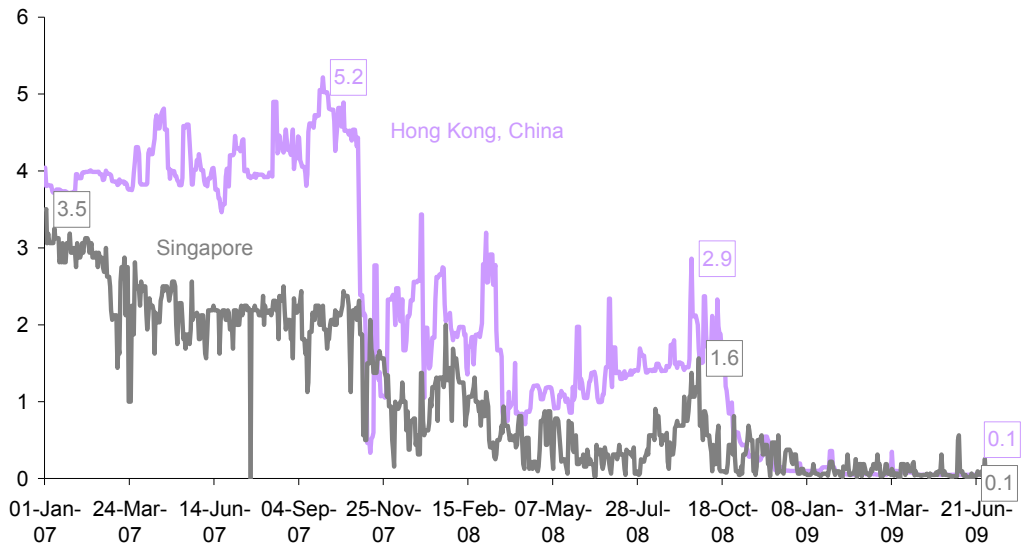
¹. Includes amounts due from, and balances with, banks of all types under the banking system of each country.

². Data for all countries until May 2009, except for Republic of Korea which is until March 2009. No 2009 data for India.

Source: OREI staff calculations based on data from CEIC and national sources (for Philippines only).

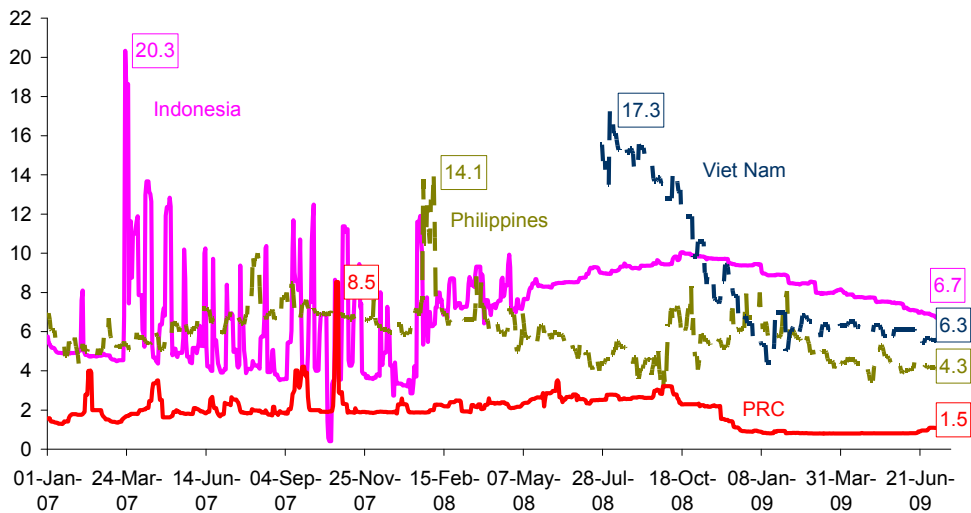
In Thailand, short-dated interest rates were reduced sharply as monetary authorities sought to limit the impact of the crisis on the economy. A major concern with monetary authorities and the Bank of Thailand was the reduced transmission of policy changes with rate reductions reflected in wholesale money markets that were not passed through to retail and commercial end users (Figures 6a, 6b, 6c). A loan guarantee plan for lending to small- and medium-sized enterprises (SMEs) was launched to relieve quantitative constraints on the flow of credit. However, the widening risk premiums being levied by banks remain a blockage to the full flow of rate reductions. The inefficiency in the transmission mechanism for wholesale money market rate reductions is one reason for the consideration of additional and expanded competition in the banking and money market sectors.

Figure 6a: Interbank Interest Rates¹ (%)

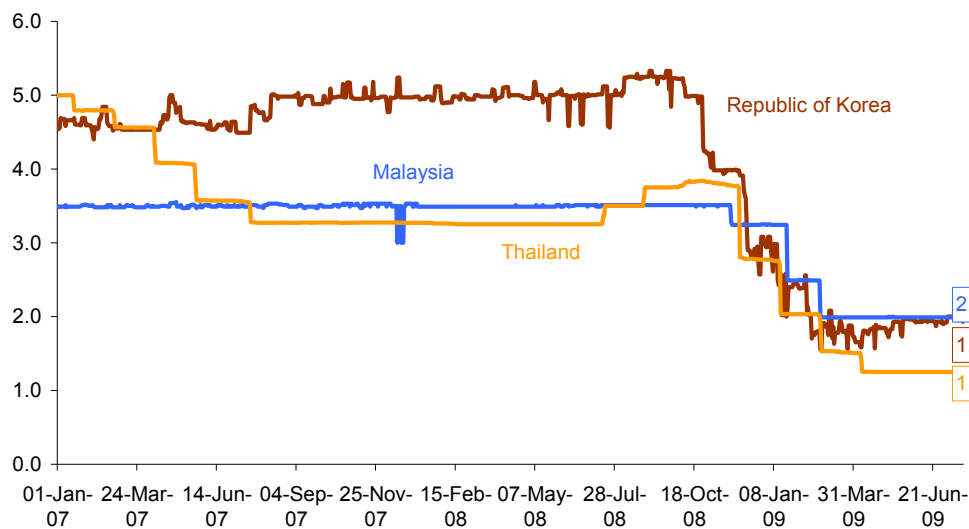


¹ Overnight interbank offer rate (IBOR), for Singapore used o/n deposit rate.
Source: Bloomberg.

Figure 6b: Interbank Interest Rates¹ (%)



PRC= People's Republic of China
¹ Overnight interbank offer rate (IBOR), for the Philippines used 1-week IBOR.
Source: Bloomberg.

Figure 6c: Interbank Interest Rates¹ (%)

¹ Overnight (o/n) interbank offer rate (IBOR); for the Republic of Korea used o/n call rate; and for Malaysia used o/n deposit rates.

Source: Bloomberg.

In Viet Nam, the crisis led to substantial falls in foreign portfolio investment and stock market valuations. This occurred in an environment of high inflation and a current account deficit of 14% of GDP. To mitigate the slowdown effects, the State Bank of Viet Nam issued credit directives to the banking sector requiring credit to be extended and loans to be restructured, while at the same time operating in the open market to provide money market liquidity. Despite far reaching intervention by the central bank during the crisis, the overall future is one of liberalization and progress toward market-driven financial system development

4. Development of Money Markets: Medium-to Long-Term Challenges for Participants

4.1 Market Participants

Asian markets possess a more stable funding base—derived from retail and institutional depositors—than do G3 markets (Eurozone, Japan, US) that are more dependent on wholesale debt issuance. While remaining relatively unscathed from the subprime and structured product meltdown in the US, the region's markets were hit indirectly by the crisis' spillover effects. Yet, most of the region's money markets remained in relatively good shape, with retail and institutional depositors viewing bank deposits as the preferred method of wealth preservation, thereby allowing the region's banking systems to be flush with short-dated liquidity. The safe haven status of bank deposits has also been enhanced by deposit insurance and guarantees provided by governments to cover

demand deposits in many cases. Additionally, with much of the region having maintained strong current account surpluses and large foreign reserves, many sovereigns compared favorably with developed economies that had high fiscal and current account deficits combined with low domestic savings ratios.

The high savings ratio in the region and the rush to safe haven bank and money market deposits resulted in the buildup of liquidity in the money market, leaving banks with an excess of short-dated funds. This difference was particularly sharp when compared with many G3 financial institutions that relied heavily on wholesale capital markets for funding rather than a local depositor base. The size and dynamics of the depositor base and the relatively high savings ratio in the region helped shore up local markets against currency shortages. From the viewpoint of bank balance sheets and liquidity, this situation appeared favorable. However, it came about at the expense of the real economy, as credit flows to the private sector were stunted due to generally heightened risk aversion and a broadening credit crunch.

While a changing market profile will cause each segment of the money market to adapt to new circumstances, the roles played by major participants can significantly shape future developments in the region's money markets as they develop and mature over time.¹¹

4.1.1 Government and Central Banks

The primary responsibility of central banks is the implementation of monetary policy. A central bank's actions, policies, and regulatory framework will have a determining influence on the development and efficiency of the marketplace and in defining the direction and development of a country's financial market. In addition to formulating monetary policy, central banks in many economies are also integral to financial regulation, reserves and liquidity management, interest rate and currency intervention, open market sterilization, and bond and note issuance.

Further development of the region's money markets and a broadening of the product suite will require authorities to increase supervision and methods of risk recognition. With the onset of the financial crisis, central banks acted swiftly to lessen the impact on their respective markets. A broad range of measures were taken to maintain market liquidity and encourage the flow of funds throughout financial systems. These measures included easing monetary policy to encourage lending and economic activity, arranging swap lines with other central banks to avoid foreign currency shortages, lending foreign currency directly to domestic markets, guaranteeing deposit insurance and bank lending, and injecting capital into some banks. Open market operations were also expanded with the opening and broadening of repo markets, in which a wider range of collateral was accepted to add liquidity to the system. Central bank actions were both timely and

¹¹ Although there has been considerable progress since the mid 1990s in developing the region's capital markets, the banking sector remains the dominant source of funding. Total domestic financing increased from about 25 billion USD in 1995 to 43 billion USD in 2008. During the same period, the share of the banking sector decreased from 58% to 45% while the bond market increased from 21% to 33%. The equity market increased more modestly in size from 21 to 23%. (Source: ADB staff calculations)

effective in lessening the impact of the crisis and providing liquidity. Yet, further development of the region's money markets and a broadening of the product suite will require authorities to increase supervision and methods of risk recognition. Central banks and/or market regulators will need to ensure that adequate reporting and monitoring of risk exposures exists within the financial system; and financial institutions have robust capital positions, balance sheet strength, and risk management systems.

4.1.2 Banks and the Interbank Market

The interbank market plays a key role as it has the platform and capability to import skill sets and product innovations into a developing marketplace. In most of the region's markets, local banks dominate local LCY dealings through access to a retail customer deposit base. This provides a source of cheap funds compared with the funding platforms of many other participants. Foreign banks and new entrants without a local deposit base tend to be more reliant on wholesale and interbank swap markets to generate funding. In some instances, there may also be regulatory impediments to sourcing LCY deposits competitively. However, while local banks may have a competitive LCY advantage, the same is not necessarily the case in offshore markets. Whereas the region's banks can rely on their deposit bases for LCY, often their relative size or credit rating will make them less competitive relative to the larger foreign banks in international debt issuance markets where longer-dated term funding can be sourced. Although these markets are—following the current financial crisis—temporarily closed to all but prime names or institutions with a sovereign guarantee, the relative advantage of larger global banks over the region's banks in international capital markets remains an issue. With respect to the interbank market being the key funding platform, it has the capability to import skill sets and product innovations to a developing marketplace. Robust competition in the interbank market provides fertile ground for further improvement and product development that eventually seeps down to the underlying real economy in the form of increased efficiency in capital allocation and competitive pricing.

4.1.3 The Corporate Sector

The corporate sector can enhance development within a marketplace by changing the basis of banking relationships. The corporate sector uses money markets as lenders and borrowers of excess liquidity, as well as being counterparties for foreign exchange (FX), securities, and derivative transactions. The corporate sector is often represented by manufacturers or local subsidiaries due to a concentration of both light and heavy manufacturing throughout the region. Subsidiaries of multinational corporations often bring an existing global banking relationship to the region's markets. While these existing relationships may be strong in the home market, their global bankers may have less capability with LCY transactions. As a result, multinational corporations often represent a potential customer base for local banks seeking profitable sales and spread retention dealings with corporate customers.

Competing banks in money markets place a high value on corporate business and are generally prepared to accept narrow trading spreads when dealing with corporations. While this competitiveness drives efficiencies toward the corporate user, the money

market activity of corporations usually reflects the ebbs and flows of their cash operations, rather than their longer-term structural funding requirements, which would be more aligned to the longer-term nature of their direct investments in plant, machinery, and working capital. The corporate sector can also play a role in market development as well as act in its own self interest. While it is common for corporations to have strong one-on-one relationships with their primary bank (or alternatively to limit their dealings to a small number of domestic banks), the corporate sector can also enhance development within a marketplace by expanding the panel of banks servicing their needs. This is especially true with foreign banks, which may import solutions and intensify competition and product innovation in less developed markets.

4.1.4 Fund Managers and Investors

In line with the need for diversification and in pursuit of increased returns, fund managers and investors have sought new international markets and the opportunities they present. Alongside international fund managers, locally based managers invest on behalf of pension funds and other pooled investment funds, representing a prime distribution channel for both shorter-dated money market instruments and longer-dated debt securities. Portfolio investors often have longer time horizons and a relatively high tolerance for the currency risk inherent in an internationally diversified portfolio. The risk associated with the holding of foreign currency-denominated securities may be factored in as just one component of the overall risk–return equation and allows this customer segment to effectively see currency exposure as a separate and diversifiable risk position within a broader portfolio.

International investors and the funds management industry can add benefit and liquidity to markets focused primarily on their domestic investor base. As a natural distribution point for money market securities, fund managers have the ability to shape market development given the demand–driven model of market development. Demand for higher-yielding, asset-backed commercial paper or similar instruments will encourage banks to package assets for sale, while at the same time enhancing returns on an investor’s portfolio. Additionally, the willingness of this segment to hold securitized debt frees up bank balance sheets for additional lending and asset generation.

As has been demonstrated, each of the four main operating segments within a money market has the ability to contribute to the future development of markets in emerging economies. At the same time, they provide improved efficiencies for themselves in the form of increased competition, product innovation, sharper pricing, and increased returns.

5. The Potential Structural Shift and Crowding in Debt Capital Markets

Government stimulus packages, which have been implemented in a number of countries since the onset of the global financial crisis, have resulted in an unprecedented requirement for the financing of government bond issuances. These requirements will

extend well into the future and are likely to have a significant impact on the availability of longer-dated fixed rate finance for the private sector. Effectively, the private sector will have to compete against the government sector for bond financing from the same base of investors. The supply concerns have been reflected in sharply rising yields for longer-dated bonds despite ongoing concerns about the deflationary effects of global deleveraging. Instead of yields falling to reflect deflationary fears, the supply concern has seen US Treasury 10-year yields rise from 2.05% in December 2008 to 3.51% by the end of June 2009. US Treasury bond issues are expected to reach USD3.25 trillion in the year to September, up by USD1.95 trillion over the same period in the previous year. The Congressional Budget Office estimates an additional USD10.0 trillion of debt will be added by 2019.¹²

While the current concern focuses on the ability of the market to fund increased government debt, a separate issue arises out of the possibility that the private sector is being crowded out of debt capital markets. Any reversion of funding models could have implications for the future functioning and design of global money markets, in addition to the expansion of risk premiums for short- and longer-dated advances.

In looking at international capital markets, the most rapid developments began in the late 1980s as financial disintermediation and the development of global capital markets accelerated. This had profound effects as well-rated corporate borrowers, who had previously sought funding through single bank or syndicated loan facilities directly from their relationship banks, now had access to securitized debt markets as an alternate funding source. The major corporate borrowers found themselves able to access a deep pool of international investors. Additionally, the development of derivative products further attracted a wider pool of both issuers and investors as the swap market allowed the currency denomination—or duration of underlying cash flows of issuances—to be aligned with the participants preferred profile in major currencies.

The disintermediation process fundamentally changed the relationship between the lending banks and their corporate borrowers. Investment banks acting as underwriters and arrangers provided another avenue of funding through the sale of securities through their well-developed distribution channels to an end investor customer base. Outside of the international marketplace, a similar process occurred in which originate-to-distribute models competed with bank lending for domestic borrowers in developed onshore domestic markets.

Traditional balance sheet lending had been considerably reduced by global issuances, which in turn had been priced at considerably narrower margins than the loans they replaced. Naturally, the corporate sector became more focused on this method of finance. Exposure to debt capital markets also increased, while excess liquidity compressed margins on loans with commercial banks as competition increased from securitization programs, domestic debt markets, and other banks. Well-rated large corporate borrowers were able to compete with government and quasi-government issuers for term funding provided at margins much less than available from commercial loans. In an environment of excess liquidity and easy credit, both government and

¹² Business Spectator. May 2009. The Price of Panic.

corporate sectors could be comfortably accommodated from the same pool of international investors.

With the global financial crisis that ensued in 2008, deficit funding requirements changed the appetite of international investors. In 2009, an increase in issuance has accompanied an easing in credit conditions as confidence has edged back up from the low levels of late 2008. International debt markets, however, remain largely dominated by issues backed by sovereign guarantees, which may flood the more cautious investor base at considerably higher real rates of return than were available before the crisis. Private access to international investors could be limited as many non-government guaranteed borrowers return to traditional lending from their bankers and syndicate members. Additionally, the risk appetite in many major banks for international syndicated lending opportunities may become more limited as the increasing predominance of government shareholders may cause scarce capital and resources to be devoted to domestic financing in order to aid domestic recovery.¹³

An increase in on balance sheet lending is also likely to have implications for the money market operations of participating banks. For example, short-term money market advances are not a viable option for major private sector funding requirements. This is because committed formal lending facilities from banks will be required that tend to lack the flexibility and pricing power of debt capital markets. Prior to the crisis, many corporate floating rate facilities were priced more in line with the floating rate premium for the underlying credit exposure—with little premium attached for the liquidity risk. As a result of the liquidity crisis, banks are increasingly likely to require an appropriate return for the liquidity risk in addition to the risk premium built into the credit margin. The potential crowding out of the corporate sector from major debt capital markets may also have implications for money markets as borrowers increasingly look for facilities from their bankers. An increase in syndicated on balance sheet borrowing by the private sector will need to be funded largely by the wholesale money markets. This will generate both balance sheet and capital pressures. While the growth in lending opportunities will be welcomed by banks, their funding sources will need to be expanded and structured to accommodate an increase in longer-dated committed facilities to replace many debt issues.

¹³ According to the World Bank's Global Development Finance, in 2008 total capital flows to developing countries fell from USD1.2 trillion to USD707 billion. This number is expected to fall to USD363 billion in 2009. Between 2002 and 2007, 3,000 corporations in developing countries borrowed money in the international syndicated bank debt market and 700 issued international bonds. Much of the USD2.3 trillion of debt raised in this period is now maturing. Together with increasing loan costs for new debt, the heavy rollover schedule will place strains on both liquidity and debt servicing capability, particularly in countries where the domestic currency has depreciated against the debt issuance currency. All of this is occurring against a backdrop of sharply reduced export demand. In addition, the external financing task will be made more difficult by the reduction of private capital flows. While inflows assisted by multilateral organizations will help, as will the tapping of available foreign reserves, the task remains daunting.

Table 3: Local Currency (LCY)-Denominated Bond Issuance (Gross)

| | Growth rate (LCY base %) | Growth rate (USD base %) |
|-------------------------|-------------------------------------|-------------------------------------|
| | 1Q2009 | 1Q2009 |
| | y-o-y | y-o-y |
| China, People's Rep. of | | |
| Total | (54.2) | (53.0) |
| Government | (68.4) | (67.6) |
| Corporate | 143.3 | 149.7 |
| Hong Kong, China | | |
| Total | 93.1 | 93.9 |
| Government | 89.6 | 90.4 |
| Corporate | 145.5 | 146.5 |
| Indonesia | | |
| Total | (46.3) | (57.7) |
| Government | (46.1) | (57.6) |
| Corporate | (66.9) | (74.0) |
| Korea, Rep. of | | |
| Total | 38.4 | 0.3 |
| Government | 27.2 | (7.8) |
| Corporate | 94.9 | 41.3 |
| Malaysia | | |
| Total | (15.5) | (25.9) |
| Government | (5.1) | (16.9) |
| Corporate | (45.6) | (52.3) |
| Philippines | | |
| Total | 99.2 | 71.6 |
| Government | 92.4 | 65.8 |
| Corporate | 190.9 | 150.6 |
| Singapore | | |
| Total | 11.2 | 0.8 |
| Government | 20.0 | 8.8 |
| Corporate | (64.8) | (68.1) |

Table 3 continued

| | Growth rate (LCY base %) | Growth rate (USD base %) |
|---------------------------------|-------------------------------------|-------------------------------------|
| | 1Q2009 | 1Q2009 |
| | y-o-y | y-o-y |
| Thailand | | |
| Total | 36.7 | 21.1 |
| Government | 48.0 | 31.0 |
| Corporate | (35.8) | (43.2) |
| Viet Nam | | |
| Total | (93.6) | (94.2) |
| Government | (93.6) | (94.2) |
| Corporate | 0.0 | 0.0 |
| Total Emerging East Asia | | |
| Total | (20.3) | (26.2) |
| Government | (28.9) | (34.0) |
| Corporate | 71.8 | 55.1 |
| Less PRC | | |
| Total | 17.7 | (1.6) |
| Government | 17.4 | (1.8) |
| Corporate | 20.2 | (0.1) |
| Japan | | |
| Total | (3.1) | (2.7) |
| Government | (3.7) | (3.2) |
| Corporate | 2.0 | 2.6 |

Notes:

- 1 Corporate bonds include issues by financial institutions.
- 2 Bloomberg LP end-of-period LCY–USD rates are used.
- 3 For LCY-base, total emerging East Asia growth figures are based on end-March 2009 currency exchange rates and do not include currency effects.

Source:

People's Republic of China (<http://www.chinabond.com.cn>); Hong Kong, China (Hong Kong Monetary Authority); Indonesia (Bloomberg LP); Republic of Korea (Bank of Korea); Malaysia (Bloomberg LP); Philippines (Bloomberg LP); Singapore (Bloomberg LP); Thailand (Bank of Thailand); Viet Nam (Bloomberg LP); and Japan (Japan Securities Dealers Association).

Box 2: Aspects of External Financing for Emerging Markets

Given the liquidity shortages of the third quarter of 2008, even countries with relatively sound systems and liquidity experienced significant decreases in cross-border banking flows. Included in this group were both the People's Republic of China (PRC) and Malaysia, whose banking systems could have been considered quite liquid. Following the Lehman Brothers collapse, the problem spread and intensified with reversals in portfolio flows, local currency (LCY) depreciation and rising bond yields. With the fourth quarter market meltdown, cross-border banking flows decreased dramatically.

A recent report looked at some of the factors that affected the flow decreases and also at possible mitigating factors to explain the uneven results. It was found that the presence and size of a foreign bank sector in a particular country did initially affect the flow of cross-border funding. Using the example of smaller central and eastern European countries with a largely foreign-owned banking system, the early evidence shows that parent bank support for their local subsidiaries may explain the more stable behavior of the cross-border flows.

Trade finance contracted more sharply than could be explained solely by lower volumes and prices. Reduced credit lines from banks and reduced secondary market support for trade instruments were reflected in the sharp reduction in the provision of finance.

Foreign direct investment (FDI) into the region initially held up better than expected at the onset of the crisis. However, there is evidence of lower FDI flows in early 2009. One explanation for the decline is related to a reduction in mergers and acquisitions, which are typically financed by international banks. Reductions were also recorded for syndicated loans, while there were increased remittances to multinational parent companies in developed countries and a reduction of intra-company loans to regional subsidiaries.

In considering factors that supported economic activity in the face of declining exports and capital flow reversals, two significant issues emerge. The first is that throughout the crisis central banks depleted their foreign reserves by providing foreign currency to enable the private sector to repay loans and intervening in foreign exchange (FX) markets to stabilize currencies. In the case of India and the Republic of Korea (Korea), foreign reserves declined to 80% of their June 2008 levels during the first quarter of 2009.

The second issue relates to the resilience of the banking system against a backdrop of decreasing access to cross-border funding. The reduction of external financing will need to be replaced by domestic lending. However, the ability of local banks to support increased demand for external funding may be difficult due to their limited access to external markets. A loan-to-deposit ratio of more than one indicates reliance on access to external finance such as was recently the case in Korea. Evidence from the first quarter of 2009 shows that domestic banks have been able to support domestic credit growth, albeit at reduced levels.

Factors that have contributed to the ability of domestic banking systems to absorb increased domestic demand for credit include a considerable improvement in banking system resilience due to increased profitability, greatly increased regulatory capital requirements, and a reduction in nonperforming loans over the early part of the decade. These structural improvements come on top of support from authorities provided during the current crisis, including additional liquidity, lower policy rates and reserve requirements, deposit guarantees, and bilateral currency swaps.

6. Imperfections and Various Paths for the Region's Money Market Development

International money markets in Singapore and Hong Kong, China stand out as the region's most efficient and liquid markets. Markets in Singapore and Hong Kong, China enjoy the broad based participation of both domestic and foreign banks, offering depth and liquidity as well as a developed investor segment. These markets also have efficient distribution channels between the main interbank markets and end users. They are highly integrated into global financial markets and trade a wide range of instruments denominated in domestic and foreign currencies. A common foundation of both markets is a strong and transparent legal and regulatory framework. They both have proactive monetary authorities—the Hong Kong Monetary Authority (HKMA) and the Monetary Authority of Singapore (MAS)—that oversee regulations and operations in the open market. Government support through policy initiatives has also encouraged development and growth in the banking industry. Low tax regimes, the ability to import human capital, and a willingness to integrate their markets into the global financial sector contributed to both centers becoming regional banking hubs. While these two international financial centers stand out as being extremely open and competitive with global money markets, theirs is not the only path to market efficiency.

In Malaysia, the focus has been on developing domestic money markets, which has led to robust markets in MYR-denominated cash and securities. Malaysian money markets have developed considerable depth and breadth since the 1990s. For example, the emphasis on developing domestic currency trading and securities helped insulate the economy from the worst effects of the recent financial crisis—approximately 90% of bank assets are held in MYR-denominated assets. Other characteristics of Malaysian money markets include Islamic finance the development of a liquid bond market populated by both domestic issuers and investors; reduced regulatory restrictions; the establishment of an offshore banking center in Labuan; and the recently released Financial Sector Master Plan, which is expected to encourage greater incumbent foreign bank participation as well as the entry of new foreign banks. Malaysia's financial markets are expected to be strengthened by these initiatives and the Malaysian development path could come to be viewed as an example for other emerging markets seeking to develop efficient domestic money markets.

Box 3: Islamic Finance—The New Silk Road?

Islamic Finance has been growing rapidly in recent years and is now estimated to account for over USD700 billion in transactions worldwide.¹⁴ Although concentrated in Malaysia and the Middle East, Islamic Finance represents an opportunity for the expansion of Asian money markets.

¹⁴ IFSL Research in partnership with UK Trade & Investment. 2009. Islamic Finance.

Islamic banking continues to grow at 10%–15% annually with total outstanding assets valued at USD622 billion in 2007. Sukuk¹⁵ (Islamic bonds) have also shown rapid growth with issuance in 2007 estimated at over USD100 billion, with a doubling in growth each year since 2004. The global takaful (insurance) industry is growing at 20% annually with premiums estimated at USD7.2 billion in 2007 and over USD200 billion under management (Figure B1).

Islamic finance is structured to avoid *riba* (interest), *maisir* (gambling), and *gharar* (ambiguity)—which are all prohibited under *shari'a*. Transactions are limited to ethical investments and usually involve the financing institution buying the underlying asset and either leasing it or selling it back to the borrower on a profit-sharing basis. Financial transactions should also be supported by an economic activity in business or trade to ensure that funds are channeled into a productive activity, which shields the Islamic financial system from excessive leveraging, imprudent risk-taking, and speculative activities.¹⁶

For countries that have developed *shari'a*-compliant financial products, the opportunity presents itself to establish smaller specialist markets. Malaysia is at the forefront of Islamic finance. It remains the main issuer of global sukuk, with total issuance of USD26 billion, or more than 60% of the world's sukuk issues in 2007,¹⁷ and is the largest issuer of Islamic products in Asia. In 2008, sukuk in Malaysia accounted for 38%¹⁸ of total local currency (LCY) bonds outstanding, with the quantity of outstanding Islamic (*shari'a*-compliant) money market paper about as large as that of conventional (interest-bearing) short-term securities.¹⁹

In February 2009, Indonesia issued the equivalent of USD466 million in IDR-denominated sukuk to the retail market and announced plans to issue additional USD-denominated sukuk in the near future. Thailand initially introduced Islamic banking and savings to service the southern part of the country, but has since expanded to the country's primary market of Bangkok.²⁰

Brunei Darussalam has an Islamic Banking Act and has issued *shari'a*-compliant financial instruments since 2006. The country is well placed to capitalize on the growth of this banking medium to coincide with development of its International Finance Center. While it has to compete as a conventional banking provider within the same time zone as Singapore and Hong Kong, China; Brunei Darussalam has the potential to enjoy a comparative advantage as a provider of Islamic banking services. The Philippines has established a government-controlled Islamic bank—Al Amanah Islamic Investment Bank (AAIIB)—following the central bank's provision of regulations for Islamic banking in 1996. In addition, the money centers of both Singapore and Hong Kong, China have greatly expanded their Islamic banking operations in a bid to attract their share of this growth opportunity.²¹

¹⁵ Sukuk are defined as certificates representing a proportional undivided ownership right in tangible assets, a pool of tangible assets, or a business venture in a specific project or investment activity in accordance with *shari'a* principles.

¹⁶ Dr. Zeti Akhtar Aziz, 2009. Address by the Governor of Bank Negara Malaysia at the Euromoney Islamic Finance Summit. 24 February 2009.

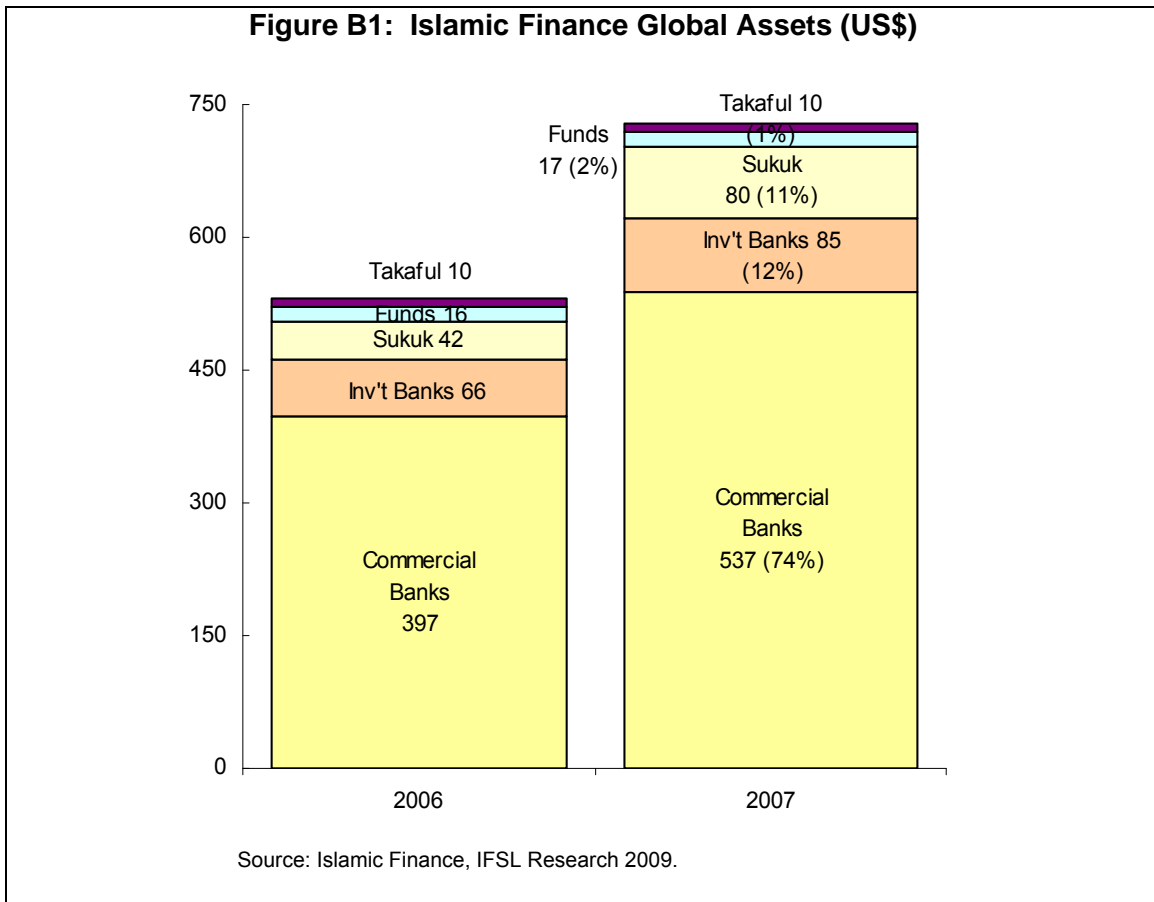
¹⁷ IFSL Research in partnership with UK Trade & Investment. 2009. Islamic Finance.

¹⁸ ADB. AsiaBondsOnline website <http://asianbondsonline.adb.org>

¹⁹ Loreton and Wooldridge. 2008. The Development of Money Markets in Asia. BIS Quarterly Review. September 2008.

²⁰ ADB. AsiaBondsOnline website <http://asianbondsonline.adb.org>

²¹ ADB. AsiaBondsOnline website <http://asianbondsonline.adb.org>



In developing country money markets, one area of focus could be trade-finance-related securities. The extension of trade finance credit has been significantly boosted by a G20 commitment to provide USD250 billion over the next 2 years to support trade finance globally. This commitment follows various national efforts through export–import banks and similar agencies. ADB recently announced a Trade Finance Facilitation Program, which is one of many regional initiatives targeting increased flows of trade financing. The program will help banks in developing countries provide trade-related finance through a credit guarantee product that will confirm banks against payment by trade credits issued by approved banks. The program also includes a revolving credit facility in which ADB provides loans to issuing banks to on-lend to exporters and importers to finance their trade-related transactions. Depending upon whether the trade transaction is securitized in the form of trade bills, as opposed to straight loans, this facility could represent an opportunity for less developed money markets to specialize in credit-enhanced paper trading as well as with counterparties that have a credit enhancement on their trade transaction by virtue of a guarantee from a third party.

Elsewhere in the region, domestic money market development varies. However, there are a number of market structure issues that inhibit market advancement or interfere with the effectiveness of capital allocation. In Indonesia, for example, smaller banks with

limited capital bases, including rural banks, are at a disadvantage in competing effectively with their larger and better capitalized counterparts. The central bank—Bank Indonesia—also made exchange rate stability its strategic priority following the currency depreciation due to capital flight during the 1997/98 Asian financial crisis. Accordingly, monetary policy has targeted exchange rate stability aimed at avoiding disinvestment through rates that are kept relatively high. As a capital-importing economy with a significant dependence on commodity investment, exchange rate stability is critical for Indonesia and options for substantial interest rate easing are somewhat limited.

In order for financial markets to develop further, banking sector restructuring could assist in the recapitalization of banks and allow them to grow sufficiently and to compete with other larger banks in the region. However, in some economies, blockages in the transmission mechanism of rate reductions provide one example of markets not functioning at optimal levels. Rates in wholesale money markets may for example have reflected policy changes, but the underlying real economy may not have felt the full benefits as rate reductions by major banks are not being passed on to the customer base. A further opening up of financial markets via less restrictions on foreign ownership of local banks and the issuance of more licenses—both of which are currently under consideration by for example Thailand's Ministry of Finance—could assist in promoting competition in domestic money markets while also unblocking the transmission mechanism.

The funding gap and open arbitrage opportunity for funding local assets with short-dated foreign currency borrowings—as was the case in Korea, stoking both volatility in asset markets and occasionally generating price movements counter to official monetary policy aims—showed the unexpected side effects of protracted imbalances in funding platforms.²²

The existence of “kerb”, or unofficial, markets reflects the misallocation of resources in the official marketplace. In the PRC, for example, kerb markets operate alongside the official markets and extend beyond securities trading to include money markets. As a result, there is an informal lending market for companies with surplus liquidity to provide funds for companies in need.

Of the recent growth in lending in the PRC, however, it is estimated that a large portion of it is being soaked up by state-owned enterprises (SOEs).²³ Of CNY1.62 trillion in new loans made in January 2009, an estimated 90% flowed to SOE projects. The heavy bias

²² The heavy forward selling of US dollars by Korean exporters allowed an arbitrage opportunity to appear, in which dollars could be swapped in the offshore forward and swap markets into won at levels up to 100 basis points beneath onshore certificates of deposit (CDs) and government bonds. While authorities acted to limit short-dated dollar debt by imposing limits on foreign currency lending to domestic borrowers—and put a withholding tax in place—arbitrage players purchased substantial amounts of paper funded by the cheaper offshore forward market. The subsequent disruption in dollar liquidity saw the trades unwind with pressure exerted on both the won-funding markets as well as the securities markets, which saw high levels of volatility as assets were sold to unwind trades. Similar in effect to the 1997/98 Asian financial crisis, this disruption was caused by large capital outflows that derived from short-dated interbank loans. The arbitrage opportunity, despite authorities' efforts, had become massive, and its unwinding over a short timeframe exacerbated a volatile situation.

²³ Financial Review. September 2009. China's SOEs do most of the Reaping.

of the PRC's stimulus plan towards SOEs is effectively crowding out private sector borrowers. It is also estimated that about 70% of loans from the PRC's four major state-owned commercial banks were made to SOEs that account for only one third of the country's total production.²⁴ The perceived reluctance of banks in the PRC to lend funds to non-state enterprises has led to creditworthy corporations being forced to use unofficial markets to generate funding at rates well above spreads in the official markets. This represents a misallocation of resources away from an efficient user toward a more familiar, but less efficient, user of the same capital. This situation is in part due to the limited credit analysis capacity among the relevant lending divisions of banks with regard to small and private corporations.

Confidence, market depth, and liquidity are key to ensuring the efficient allocation of capital throughout the system. While each market has domestic considerations for fashioning its money market development, the central tenets common to all markets include the requirement for confidence, market depth, and liquidity. In looking at ways to generate both confidence and liquidity, it is helpful to understand the interrelationship between the two. It is very difficult to imagine a deep and liquid market that lacks the confidence of the financial community. It is also difficult to imagine a market that has the financial community's confidence yet is lacking depth and liquidity—particularly given the competitive nature of global financial markets and the pursuit of returns. The task of generating such conditions is made more difficult by the fact that confidence is an intangible that has no physical structure to be broken down and analyzed to understand how it is created. However, the essential elements of both confidence and liquidity are clearly evident when looking at any efficient market, whether financial or otherwise.

To ensure the existence of an efficient market that can function at its optimal level in allocating resources, market liquidity must capture the aspects of immediacy, breadth, depth, and resiliency. Immediacy refers to the speed with which a trade of a given size and cost can be completed; breadth, often measured by the bid–ask spread, refers to the costs of providing liquidity; depth refers to the maximum size of a trade for any given bid–ask spread; and resiliency refers to how quickly prices revert to fundamental values after a large transaction. In looking at financial markets in developing economies and the measures required to engender confidence and enhance liquidity, the underlying needs of a particular market must be given special consideration. Financial markets must be developed within the constraints of real demand from end users rather than just intermediaries.

A market's depth is a quantitative measure that refers to the ability of a market to handle large trade volumes without a significant impact on prices.²⁵ From a money market perspective, the spot FX market for the major currencies is an example of a market that is very liquid and capable of absorbing large and unexpected flows.

An alternate aspect of a market's breadth can be considered from two different qualitative aspects. The first is the spread of competing interests in a market where there

²⁴ The four largest state-owned commercial banks in the PRC are ICBC, Bank of China, China Construction Bank, and the Agricultural Bank of China.

²⁵ OECD Glossary of Statistical Terms.

is a large pool of interested participants, although they are not necessarily coming from the same transactional direction. For example, market breadth is enhanced by the participation of a range of parties—market makers and intermediaries, originators and sellers, investors, end users, and buyers—that interact through price discovery to balance out demand and supply. Another aspect of breadth is related to the range of alternative competing products to satisfy customer demand. This allows the buyer to find the most efficient solution from the range of competing products. From a money market perspective, alternatives in investment products could be the differing returns available from deposits when compared with purchasing either commercial paper, bank certificates of deposit (CDs), or treasury bills—all of which will provide a return on funds invested, but with each one having its own unique characteristics.

Local money markets often have insufficient depth and liquidity to attract global portfolio investors. Market liquidity under a range of measures has generally failed to grow in line with either the development of LCY bond markets or that of more developed bond markets.²⁶ Studies have suggested the following:

(i) Turnover ratios measuring secondary market trading relative to bonds on issue in emerging East Asia failed to increase in line with other markets. This is partly attributable to the rise of buy-to-hold fund managers who sought LCY assets in order to match their liabilities. This market segment rarely traded the stock back to the secondary market and thereby contributed to reduced liquidity (Figures 2a and 2b).

(ii) Bid–ask spreads as a measure of market tightness indicate that spreads are stable but remain relatively wide when compared to more developed markets. Also, spreads widen when comparing government with corporate issuance, hampering turnover as the cost of trading remains relatively high.

(iii) Yield volatility is also elevated in developing markets due, in part, to the involvement of speculative investors with aggressive trading strategies. This feature can be exacerbated in instances where foreign exchange volatility is high, thereby amplifying investment returns.

Several studies²⁷ on measures to develop more sophisticated financial products and the diversification of risk exposures—in addition to liquidity and efficiency—in emerging Asian bond markets have identified clear guidelines on foreign investment, regulatory quality and creditor rights, market infrastructure, taxation, and the size of the local institutional investor base. Rules and regulations should also be clear, transparent, consistent, and simple. A rational conclusion that could be drawn from these studies would be that liquidity and wider investor participation in money markets can be influenced by the same factors suggested for regional bond markets.

²⁶ ADB. November 2008. Asia Bond Monitor. Manila.

²⁷ ADB. April 2009. Asia Capital Markets Monitor. Manila.

7. Challenges in Bringing Money Markets Back to Life

Despite the diversity that exists in emerging Asian markets, there is a common financial market architecture that can enhance the development of individual markets in the region. A transparent and robust legal and regulatory framework is a fundamental precondition for maintaining confidence in financial markets as participants look for certainty and the enforceability of legal obligations. A regulatory environment is enhanced by consistency in application to each market segment, which provides the banking system with a clear roadmap of regulatory expectations and requirements. Prudent regulation and policy aimed at the appropriate level of bank capitalization in the marketplace is particularly important in a market that includes a large number of smaller financial institutions, which may be encouraged to consolidate to achieve sufficient size in both capitalization and balance sheets.

Credible central bank policies and market activity supportive of policy objectives are essential for market confidence. Information flows and the flexibility of open market operations are important to increase confidence in the central bank's willingness and ability to ensure the smooth functioning of the system. Liquidity injections and broadening acceptable securities for repos is a recent example of central bank policy flexibility. The actions of the US Federal Reserve in relation to the seizing-up of secured lending markets and their initial response to broaden access could provide regional central banks with an example of future contingency planning in extreme circumstances.

The continued liberalization of domestic financial markets and the encouragement of foreign bank and skilled labor to participate in local markets will create deep and functioning markets able to respond to the underlying financial needs of the economy. These actions also promote a market's ability to efficiently allocate financial resources. In addition, foreign bank competition within the domestic market tends to enhance efficiency as technology and international practices are imported and find their way into domestic institutions and the local marketplace. A market looking to develop its financial system may import expertise more quickly rather than cultivate it domestically, thereby shortening the ramp-up period toward full development. A competitive taxation regime can also help drive regional competition for financial institutions to domicile themselves in one country over another.

Effective risk management processes—applied at both the regulatory levels and by individual participants—are important to instill confidence in other market participants and the risk profile of the market itself. A risk management system that recognizes imbalances in a financial system and provides early warnings that instigate policy responses can assist in building confidence. Cross-border collaboration with regional policymakers, regulators, and market participants will encourage mutual oversight and best practices. Improved corporate governance is also crucial for the management of financial institutions' operations, for money market communication, and for boosting market confidence in financial institutions.

Effective distribution channels to secondary markets can help offset securities and risk positions against an underlying real demand, and help reduce market risk of both parties and increase primary market operations. A robust deposit base and stable funding

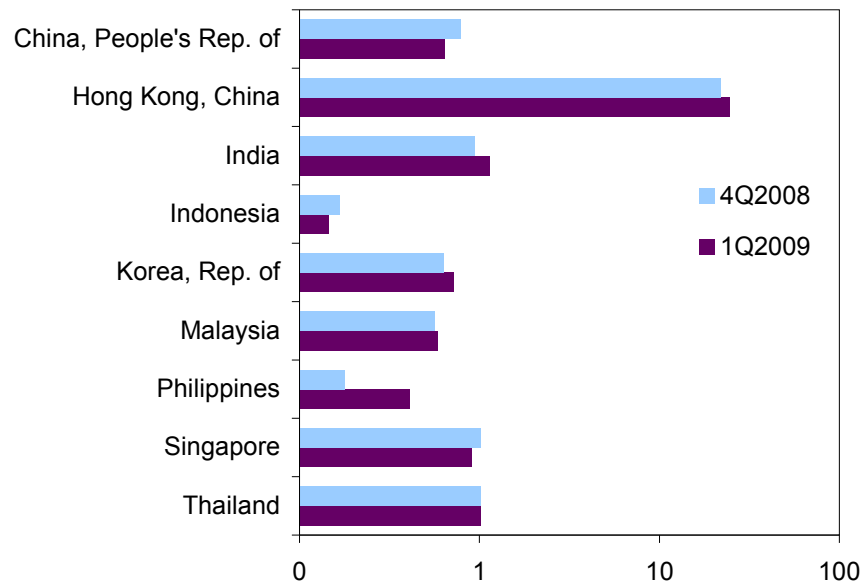
platform that gives attention to loan-to-deposit ratios can also help banks avoid imbalances and risks associated with too much dependence on wholesale funding markets, and wider access to international capital markets can help increase competition in onshore markets and drive both volumes and price efficiencies toward end users.

Liquidity in the region's money markets can be deepened by proactive financial policies and practices that encourage participation by a broad and diversified investor base, which will contribute to the depth of financial markets. International banks can bring a different risk appetite as they break into new industry segments and develop a local customer base. Domestic institutions' wider access to the financial marketplace can also add depth by encouraging domestic investment vehicles and pension fund managers to use a broader set of investment products rather than simple money market deposits and government bonds. In particular, encouraging niche players that specialize in market sectors or have a particular strength can drive competitive pricing and contribute to depth in the market.

Product innovation such as securitization of receivables or mortgage pools can provide a broader product range for alternative investments and drive efficiencies toward end-investors, who would be given a wider choice of competing products, as well as free-up the balance sheets of originating banks. Introducing derivatives and other hedging mechanisms can also help encourage liquidity and depth, while providing a mechanism to offset risk without liquidating underlying positions.

Effective market infrastructure and support systems, such as trading and settlement systems, can better handle increased turnover and volumes, which will be required as markets grow and become more liquid. Such systems can also help facilitate information flows and technological advances, particularly for trading platforms that assist trading throughput; thereby increasing liquidity, putting downward pressure on volatility, and making risk management simpler. Enhanced credit, settlement, and market risk management systems can also increase confidence at the individual bank level—by ensuring that risks are within the limits of internal tolerance—and allow banks to make full use of lines extended to counterparties.

Figure 7a: Government Bond Turnover Ratios

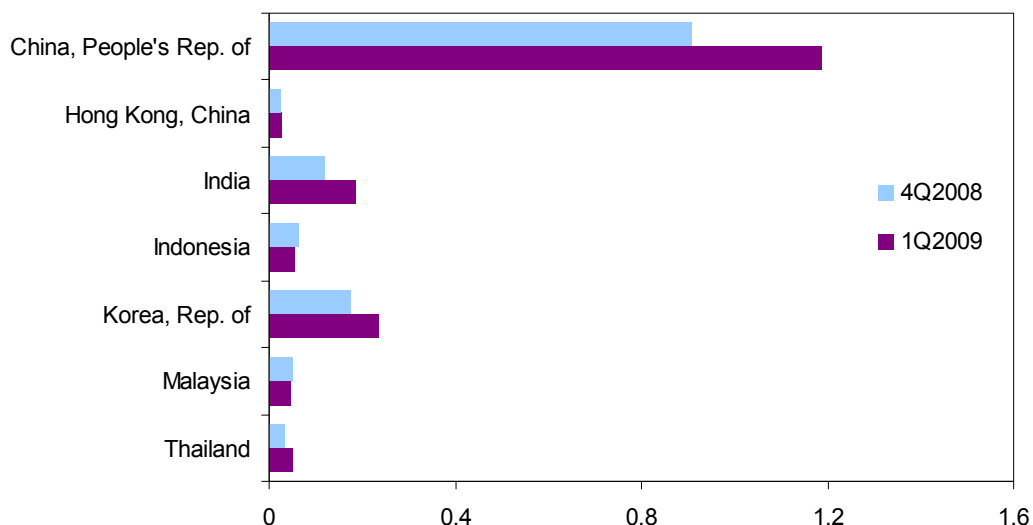


Notes:

1. Calculated as LCY trading volume (sales amount only) divided by average LCY value of outstanding bonds during each 3-month period.
2. Bonds outstanding for India as of 4Q2008.

Source:

People's Republic of China (<http://www.chinabond.com.cn>); Hong Kong, China (Hong Kong Monetary Authority); Indonesia (Indonesia Stock Exchange); Korea (KoreaBondWeb and Bank of Korea); Malaysia (Bank Negara Malaysia); Philippines (Bureau of the Treasury); Singapore (Monetary Authority of Singapore and Singapore Government Securities); Thailand (Thai Bond Market Association and Bank of Thailand); Japan (Japan Securities Dealers Association); and India (Clearing Corporation of India Ltd. and Securities Exchange Board of India).

Figure 7b: Corporate Bond Turnover Ratios**Notes:**

1. Calculated as LCY trading volume (sales amount only) divided by the average LCY value of outstanding bonds during each 3-month period.
2. Bonds outstanding for India as of 4Q2008.

Source:

People's Republic of China (<http://www.chinabond.com.cn>); Hong Kong, China (Hong Kong Monetary Authority); Indonesia (Indonesia Stock Exchange); Republic of Korea (KoreaBondWeb and Bank of Korea); Malaysia (Bank Negara Malaysia); Philippines (Bureau of the Treasury); Singapore (Monetary Authority of Singapore and Singapore Government Securities); Thailand (Thai Bond Market Association and Bank of Thailand); Japan (Japan Securities Dealers Association); and India (Reserve Bank of India and the Clearing Corporation of India Ltd.).

7.1 The Funding Model

The funding model used by market participants and end users in the real economy is at the core of most imbalances within financial systems. It is often related to mismatching maturities, interest rates, or currency exposures. The funding model used by market participants and end users in the real economy is usually related to one or more aspects of mismatching maturities (liquidity), interest rates, or currency exposures. The causes may be an excess dependence on foreign currency borrowings, short-dated money market loans supporting longer-dated assets, or an overreliance on one funding source. In a properly functioning and liquid interbank money market, the funding decision will be price sensitive, whereby the cost or return will largely be the sole determinant of whether to fund in local or foreign currency.²⁸ This is particularly apt in interbank money markets, where considerations of mismatching maturities within internal tolerances is an integral part of book management, and also where liquidity issues are less significant given the short-dated nature of transactions and the bank status of participants.

²⁸ Where a price differential exists and all else is equal, arbitrage traders will quickly eliminate any significant differential by borrowing in one market and swapping the currency and lending or investing in another, thereby bringing the markets into equilibrium.

A differential may result from intentional regulations limiting market activity or from external factors that inhibit market efficiency. Examples of these include (i) limited access to LCY for foreign banks, based on regulations and the effective existence of a two-tier, onshore and offshore market; (ii) central bank rules that determine acceptable purposes for LCY transactions, such as trade-based dealings; (iii) a lack of liquidity in one currency and or thin market participation; (iv) restricted access to foreign currency; and (v) insufficient dealing, credit, or settlement lines between participants.

The creation of a currency exposure is as complicated as it is important for both end users of the funds and the small investors who have limited portfolio diversification. Where an efficient, open, and liquid short-dated market operates, the currency funding decision for interbank trading is a straightforward price consideration and is usually free from other factors. This is not necessarily the case outside interbank markets, where the situation can be quite different, particularly for corporate participants in the real economy. In contrast to the interbank borrower, a manufacturer will require funding to build and operate a plant, fund inventory, and provide working capital. In this situation, considerations are quite different from those of the short-term money market and its interbank users.

Factors to consider include (i) which currency offers the longer duration and best fits with the end needs of matching the duration of financial liabilities against financial or physical assets; (ii) the ability of the non-bank or commercial borrower to access foreign currency funding efficiently; (iii) whether the credit quality of the borrower is sufficient to access capital markets directly through bond issuance, or if the borrower is limited to bank loans; (iv) depending on the currency of assets and cash flows, whether borrowing in another currency is an option, which could open foreign exchange exposures beyond what can be efficiently hedged; and (v) how to minimize interest rate exposure by determining which currency can provide longer-dated fixed rates rather than floating rate exposure.

The real economy borrower will need to look at pricing as only one component of the decision-making process. This will ensure that funding is appropriate to needs and financial risk is mitigated by transferring it to the lender or investor. For example, corporate funding through longer-dated, fixed-rate bond issuance in the currency of its cash flows will effectively be transferring the liquidity, interest rate, and currency risks to the buyer of the security for the duration of the bond—unlike a borrower of shorter-dated funds faced with multiple rollovers, each with a new interest rate setting.

In a mirror image of borrowers in the real economy, investors are faced with a similar situation in exposing investments to currency movements. While a particular currency may offer higher rates of return than the local currency, there remains a similar risk to the kind experienced by the borrower in terms of currency volatility and its effect on absolute returns. While longer-dated portfolio investors may be able to incorporate this risk through a portfolio effect over a range of diversified exposures, the smaller investor will usually not have the benefit of diversification. The investor will expose expected returns to currency risks that may well overpower the benefit gained by the increased interest rate.

8. Conclusions: Emerging Stronger from the Global Financial Turmoil

The transmission and impact of the financial crisis to otherwise healthy banking systems has highlighted the importance of addressing regulatory shortcomings and structural flaws that exist in some markets. For a money market to function optimally in allocating financial resources, deep and liquid markets need to operate with the broad participation of financial interests and a range of competing products and solutions. While the current crisis in the global banking system may tend to slow down market liberalization, a restricted market that does not encourage further development and competition is unlikely to function efficiently. The underlying rationale remains the same: consolidation of smaller banks, industry restructuring, and recapitalization may be necessary to strengthen the banking system and allow access to competing international markets. The benefits of more open and liberalized markets will be reflected in competitive pricing and access to financial solutions for users who generate underlying economic activity and drive growth.

Improved liquidity management practices are central to ensuring that banks are aware of their structural liquidity position, measurement and modelling assumptions, and available buffers in the event of external shocks. It is recognized that liquidity buffers are relatively expensive to maintain at elevated levels. However, the cost of holding short-dated cash and government paper as protection against unforeseen circumstances should be considered against the even more expensive alternatives. While it is not possible to predict every contingency, it is clear that widely used risk management models and their implicit assumptions were deficient in dealing with the global financial crisis. In the future, such models will need to be broadened and upgraded to consider a broader universe of potential circumstances. Liquidity models have largely been based on long held assumptions about the historical performance and prior market acceptance of various asset classes. An example of an unexpected impact of market stress can be found in asset-backed securities, which had previously been considered liquid through either sale or use as collateral for secured borrowing, were found to be almost completely illiquid in the early stages of the financial meltdown.

The logistics of providing the skill sets required for both regulators and market participants in sufficient numbers will undoubtedly prove to be costly and challenging, particularly as the call for skilled supervisors and risk management practitioners rises with increased demand. However, the current financial crisis has demonstrated that these changes are both necessary and inevitable to ensure the efficient and stable functioning of financial markets in the future.

Specific policy goals should include actions to ensure that adequate consideration has been given to assumptions built into models. These models should allow for exogenous and domestic shocks as well as the following:

- **Reassess assumptions about market liquidity conditions and the stability of secured funding that underlie existing risk management practices.** The assumption that US dollar funding would be continually available at reasonable

pricing and could be rolled over indefinitely was at the core of many funding models and structures. This assumption proved to be incorrect in the face of multiple external demand shocks. Future liquidity assumptions should consider worst case scenarios and, where appropriate, have alternatives available as committed facilities to determine the adequate size of liquidity buffers. Liquidity models should also take into account differentials between securities types beyond maturity patterns when looking at liquidity availability, particularly between government and commercial securities. Stress testing for various levels of rated securities can help assess the stability of secured funding and determine the risk of market liquidity for underlying collateral becoming questionable. In developing such models, securities acceptable for repos could be included at full market value and variously rated commercial paper could be given a discounted valuation for collateralization purposes.

- **Consider extending temporary guarantees on a broad set of bank liabilities with the aim of reviving trade in money markets.** The extensive use of deposit insurance schemes and guarantees proved successful in protecting bank deposits from panic and maintaining confidence between covered institutions and deposit types. Similarly, a guarantee covering wholesale international liabilities and debt issuance has allowed some global issuers to re-enter capital markets as 2009 unfolded and markets slowly thawed.
- **Strengthen governance and risk management models.** Regulation and supervisory guidance should be strengthened for money market participants with increased and more frequent supervision at the individual bank level, especially with regard to liquidity assumptions.²⁹
- **Strengthen financial market infrastructure and complement the supervisory efforts of regulators.** Measures may include the encouragement of markets for secured financing as well as derivative markets to provide risk management tools and additional liquidity options. Central banks should encourage development of markets and foster preferred banking practices by regulation or suasion of the regulated entities.

²⁹ Under the Basel II enhancements approved at the July 2009 meeting, the Basel Committee on Banking Supervision is strengthening the treatment for certain securitizations in Pillar 1 (minimum capital requirements). The committee is introducing higher risk weights for re-securitization exposures (so-called collateralized debt obligations [CDOs] of asset-back securities) to better reflect the risk inherent in these products, as well as raising the credit conversion factor for short-term liquidity facilities to off balance sheet conduits. The committee is also requiring that banks conduct more rigorous credit analyses of externally rated securitization exposures.

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