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**Post Global Financial Crisis: Issues and Challenges
For Central Banks of Emerging Markets**

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Abstract

The subprime crisis had affected many economies, including those of the SEACEN region. Various measures to deal with both liquidity and solvency measures were taken by both the central banks and the relevant authorities. These included marrying micro- and macro-prudential measures of financial stability. Past financial crises have also demonstrated that the fragility of the financial system and uncertainties may last for some time after the initial stage of the systemic financial crisis. Consequently, any consideration for a transition strategy to phase out the current stimulus macro-economic policies must be carried out with a clear priority to be compatible with the emerging domestic and international economic environment. In the ever changing financial landscape, amidst business and credit cycles and financial fragility, central bankers need to critically assess how best to implement monetary policy and financial sector measures and also to examine the possibility of synergies and tradeoffs between them. This paper takes stock and attempts to analyse the above set of challenges facing the emerging markets' central banks during the post-global financial crisis, with particular interests to review the issues from the perspectives of the SEACEN central banks.

JEL Classifications: E58, G01, G18 and G28.

Key Words: Macro-prudential, Stress-testing, Cross-border supervision, Capital Requirement, Basel III, Central Bank Governance.

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1. Introduction

The subprime crisis had affected many economies globally, including those of the SEACEN region.¹ Various measures to deal with both liquidity and solvency measures were implemented by both the central banks and the relevant authorities. On hindsight, for the SEACEN economies, the subprime crisis came at a time of relatively low inflation and robust financial systems. Following the 1997 Asian financial crisis, many SEACEN economies have implemented a comprehensive financial master plan to ensure orderly development and soundness of the domestic financial sector. These included marrying micro- and macro- prudential measures of financial stability. However, in the age of globalisation, sound domestic financial sector could still be susceptible to financial instability and even crises when external shocks are transmitted cross-border.

Past financial crises have demonstrated that the fragility of the financial system and uncertainties may last for some time after the initial stage of the systemic financial crisis. Consequently, any consideration for a transition strategy to phase out the current stimulus macro-economic policies must be carried out with a clear priority to be compatible with the emerging domestic and international economic environment. In addition, many SEACEN central banks have recently implemented a mix of unconventional policies, making them, in some cases, more complex to unwind. These transient policies must also be consistent with the overall medium to long-run objectives of the macroeconomic policies of the economy. An adequate assessment of the sustainability and appropriateness of the current policy stance is urgently needed, and should be the first priority at this stage.

Looking forward, central bankers, facing the possibility of yet another financial debacle, must be prepared to assess how best to coordinate policy responses and how policy response mix could help in lessening the depth and duration of the crisis. In the ever changing financial landscape, amidst business and credit cycles and financial fragility, central bankers need to critically assess how best to implement monetary policy and financial sector measures and also to examine the possibility of synergies and tradeoffs between them. Furthermore, there is increased recognition that if the domestic financial framework is to be strengthened, regional/international cooperation and policy coordination are important. In this respect, the G(20) meeting has proposed various initiatives to restore confidence and stability to the global financial systems. In the post-crisis period, central banks are likely to pay greater attention to financial stability in framing their monetary policies. As such, good central bank governance is more important

¹ The South East Asian Central Banks (SEACEN) Research and Training Centre group of central banks and monetary authorities was established in 1982. As of January 2011, the group has 17 members, namely Autoriti Monetari Brunei Darussalam; National Bank of Cambodia; The People's Bank of China; Reserve Bank of Fiji; Bank Indonesia; The Bank of Korea; Bank Negara Malaysia; The Bank of Mongolia; Central Bank of Myanmar; Nepal Rastra Bank; Bank of Papua New Guinea; Bangko Sentral ng Pilipinas; Monetary Authority of Singapore; Central Bank of Sri Lanka; Central Bank, Chinese Taipei; Bank of Thailand and State Bank of Vietnam.

than ever to ensure that central banks have clearly defined and credible roles to deliver their services effectively and efficiently.

This paper attempts to analyse the above set of challenges facing the emerging markets' central banks during the post-global financial crisis. We are particularly interested to review the issues from the perspectives of the SEACEN central banks. Section 2 of the paper examines the present economic landscape, with special focus on the recent surge of capital to the region and its implications. Section 3 looks at the challenges in designing transition policies, shifting away from the crisis policy measures. The following section (Section 4) reviews various aspects of macro-prudential regulations and the experiences of the SEACEN economies in managing them. The importance and implementation of stress-testing will also be discussed in great length in Section 5. Recognizing the globalized nature of the banking system, a closer assessment of the need and challenges in conducting cross-border supervisory activities will be presented in Section 6. In Section 7, we will review the recent important proposal on capital adequacy ratio breakdowns under Basel III. A few governance issues that come with the financial stability mandate will be raised and analysed in Section 8. A brief concluding section ends the paper.

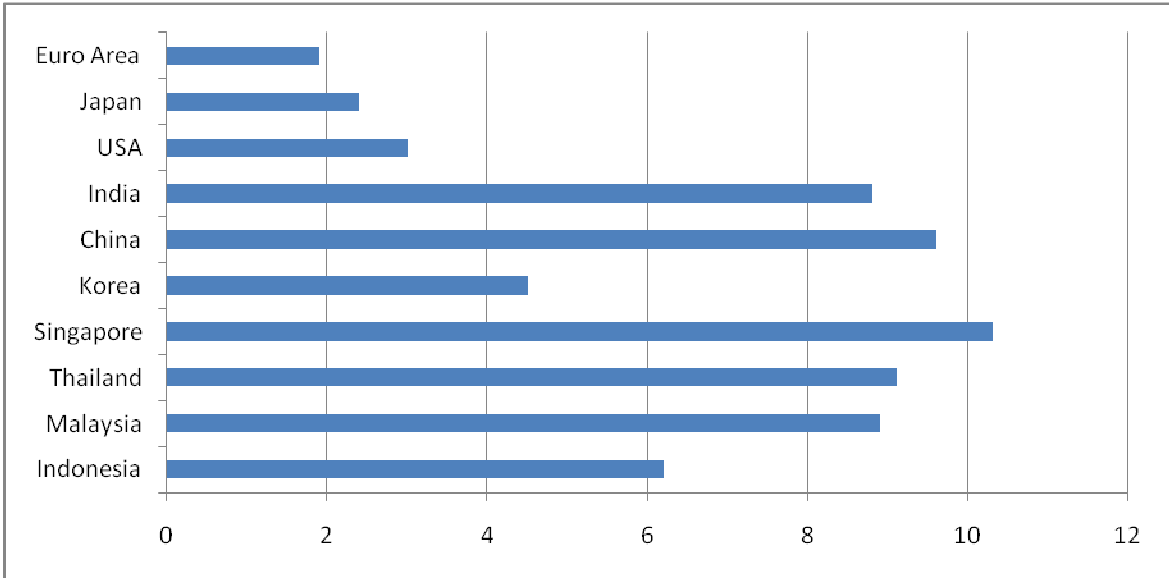
2. Return of Capital Surges into SEACEN Economies

The return of strong surges of capital to Asia, including the SEACEN economies, is expected to cause challenges to macroeconomic management policies in the region. Asia, one the least affected region by the subprime crisis, is recovering and advancing with much resilience, particularly after the second half of 2009. The average growth rate of major Asian economies more than tripled that of the major advanced economies (Figure 1). This is in the wake of better global conditions underpinning improved liquidity in global financial markets. As such, to rein in inflationary pressures, most Asian economies, SEACEN included, have implemented tighter monetary policies corresponding to rising cost of borrowing. The shift to tighten the monetary policy stance is in direct contrast to those in developed economies where the economic recovery is expected to remain weak amidst the existence of uncertainty in the financial sectors. Interest rates have therefore been kept low to spur economic growth. For example, In November 2010, the US Federal Reserve launched another round of quantitative easing (QE2), with the intention to purchase treasury bonds totaling U\$\$600 billion through to the second quarter of 2011.² Combined with about \$300 billion in reinvestment of the Fed's maturing mortgage bonds, total

² The Federal Open Market Committee indicated that it was compelled to act because "progress" towards their objectives of full employment and stable prices "has been disappointingly slow." This move is seen as a historic test of unconventional monetary policy, using tools devised during the financial crisis to add fuel to an economy that has been expanding for 15 months.

purchases could run as high as \$900 billion, or about \$110 billion a month. The banking crisis in Ireland in November 2010 has also further dented confidence in an already uncertain global financial market. It is estimated that Ireland owed well over \$130 billion to German banks and British banks, respectively. The wide exposure of the crisis to the rest of the Euro market will likely undermine market confidence in that region in the coming months. As such, a widening in the earning potential between emerging Asian and matured markets should be expected, contributing to further increases in investors' risk appetites and better risk perceptions which eventually would lead to surges in capital inflows, particularly portfolio flows, into emerging economies.

Figure 1: Gaps in Annualised Economic Growth Rates
(End of 2010 q2 in percentage)



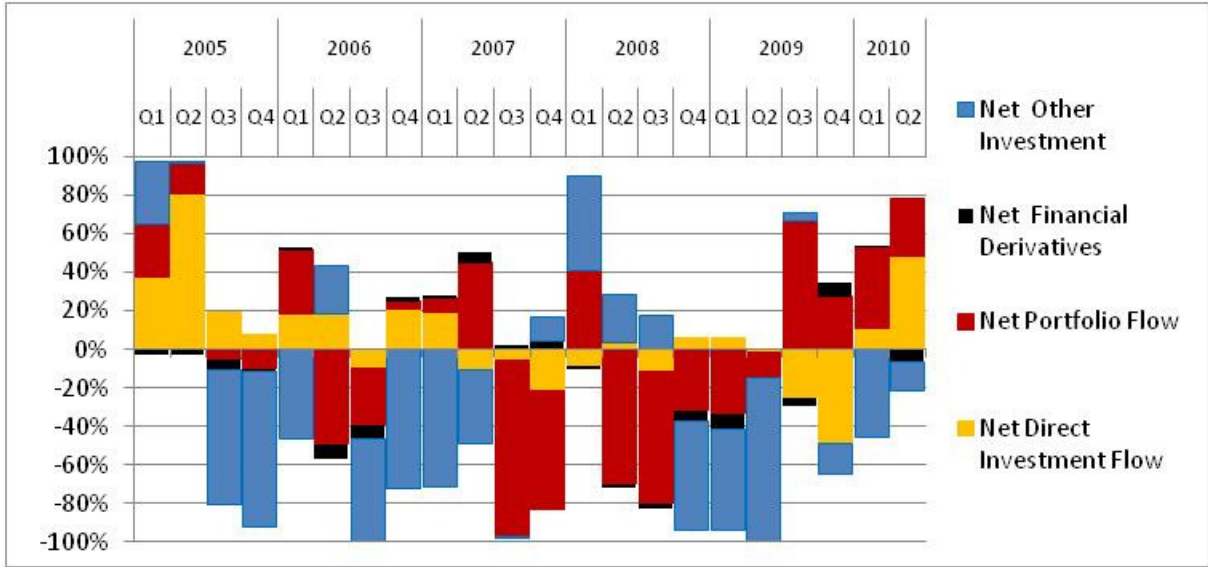
Source: The CEIC database

In addition, the near zero cost of borrowings in the US has resulted in a greenback carry-trade where portfolio investments flow into the regional bond markets, in particular government securities. During the first 9 months of 2010, it is estimated around Rp131.13 trillion (or about US\$14 billion) worth of external funds flowed into Indonesia, of which around 62.7 percent and 21.7 percent targeted government bonds and Bank Indonesia securities, respectively. Conversely on the whole, bank-related flows have remained weak (IIF 2010). On the other side of the equation, in most instances, both financial and non-financial corporations of SEACEN economies have started to issue additional equity to raise capital, partly to match the higher foreign participation.

Coinciding with the global recovery, capital inflows into the SEACEN region were particularly evident during the third quarter of 2009.³ During the first-half 2010, the net capital inflows of US\$7.5 billion contrasted sharply with a net outflow of US\$28.5 billion during the second half 2009. The net capital flows continued to register inflows, reaching US\$11.6 billion during 1H2010. Similarly, net direct investment flows also reversed from an outflow of US\$17.8 billion during the second half 2009 to an inflow of US\$11.8 billion during the second half of 2010. Portfolio investment flows also witnessed a large trend reversal, registering inflows of US\$26.7 billion and US\$26.5 billion during second half of 2009 and first half of 2010 respectively compared to an outflow of US\$3.6 billion in the first half of 2009. Meanwhile, net other investments continued to register outflows of US\$24.1 billion, US\$1.7 billion and US\$ 25.9 billion in first-half of 2009, second-half of 2009 and first half of 2010, respectively.

As expected, net capital inflows during this period was dominated by portfolio flows, particularly after the second-half of 2009 (Figure 2). However, proportion-wise, foreign investments have also started to pick up during the first-half of 2010. The IIF (2010) estimates a net inflow of US\$825 billion to emerging economies in 2010 comprising US\$186 billion in net portfolio investment inflows and US\$366 in net foreign direct investments. If the current portfolio trend continues, the SEACEN region will account for around 30% of all net portfolio flows to emerging economies in 2010, reflecting the quantum enormity of inflows into the region.

Figure 2: Composition of Capital Flows

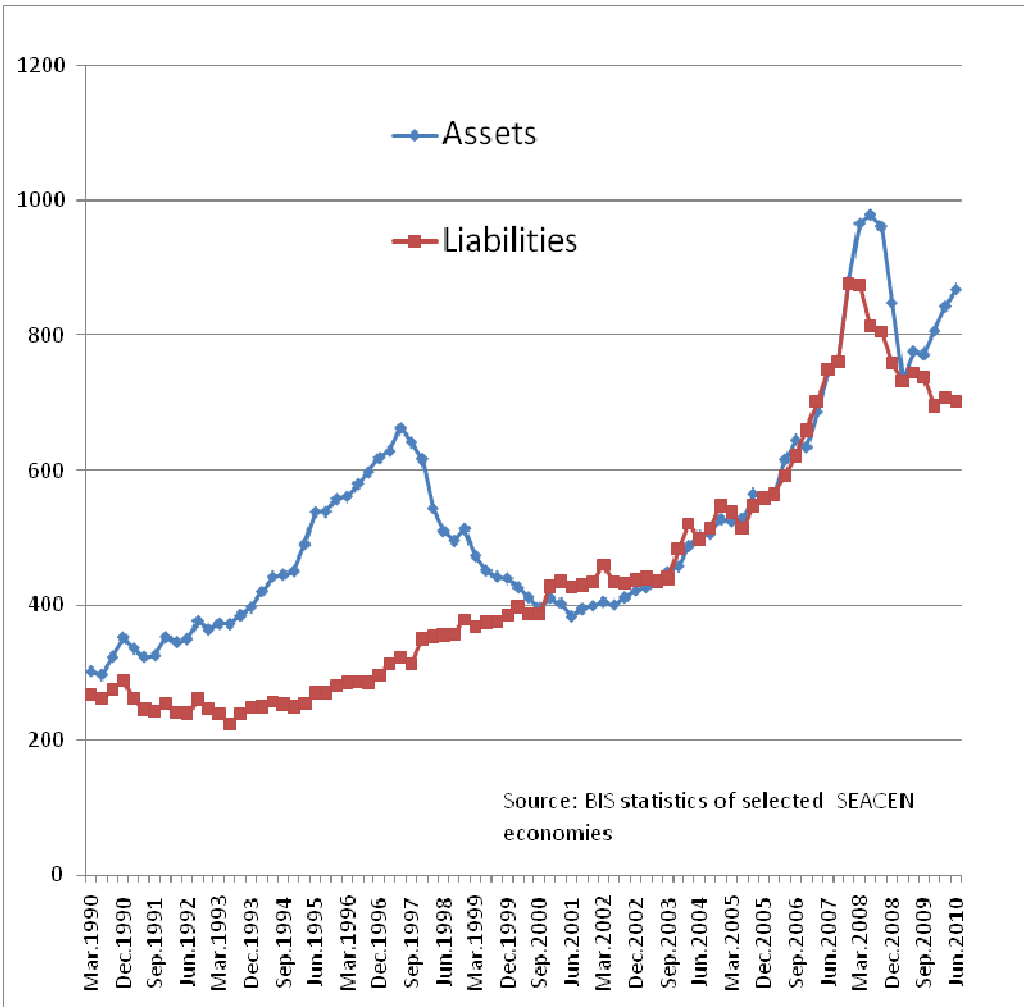


Source: CEIC Database

³ Indonesia, Korea, Malaysia, Philippines, Singapore, Chinese Taipei and Thailand.

For the SEACEN economies, the role of the international banking system has always been an important one (Figure 3). Assets or claims (lending) of BIS reporting international banks to SEACEN economies reached its pre-1997 financial crisis of above US\$600 billion in the second half of 1997. At its lowest in 2001, total claims dropped to below US\$400 billion. Only in second half of 2002, did assets of international banks to SEACEN economies begin to pick up again and reached its peak at the end of the first half of 2008 ---just before the collapse of the Lehman Brothers. What is interesting to note, however, is that SEACEN economies have become sources of capital for the international banks. Liabilities of international banks have largely matched their assets/claims to SEACEN economies until the end of the first quarter of 2008. The strong economic outlook of the SEACEN economies in 2010 has again attracted strong lending from these international banks.

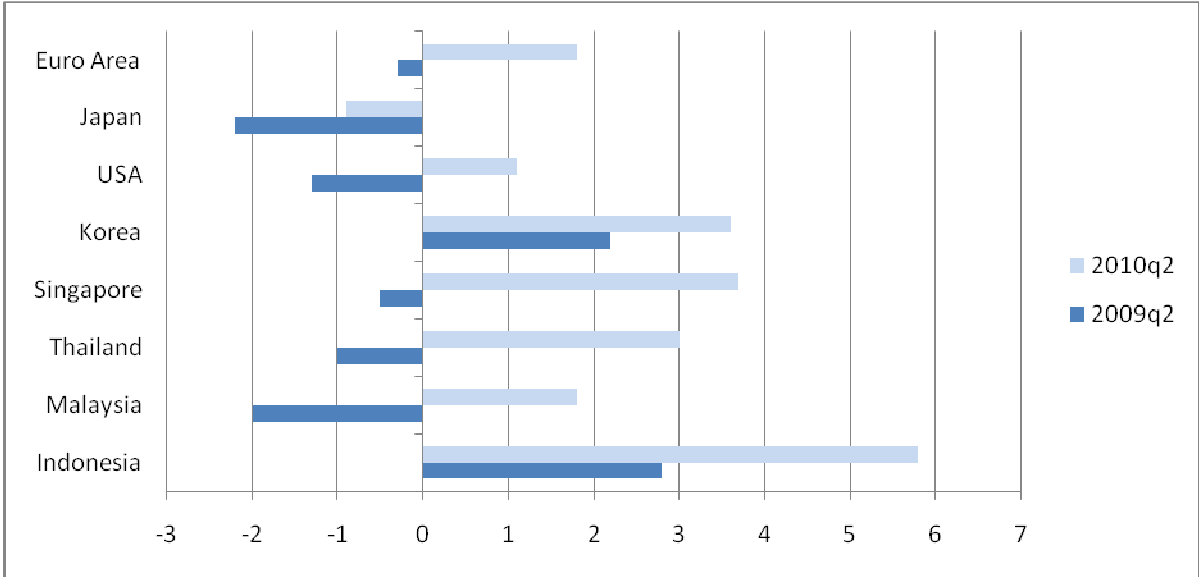
Figure 3: Assets and Liabilities of Reporting International Banks to SEACEN Economies



Source: BIS Database

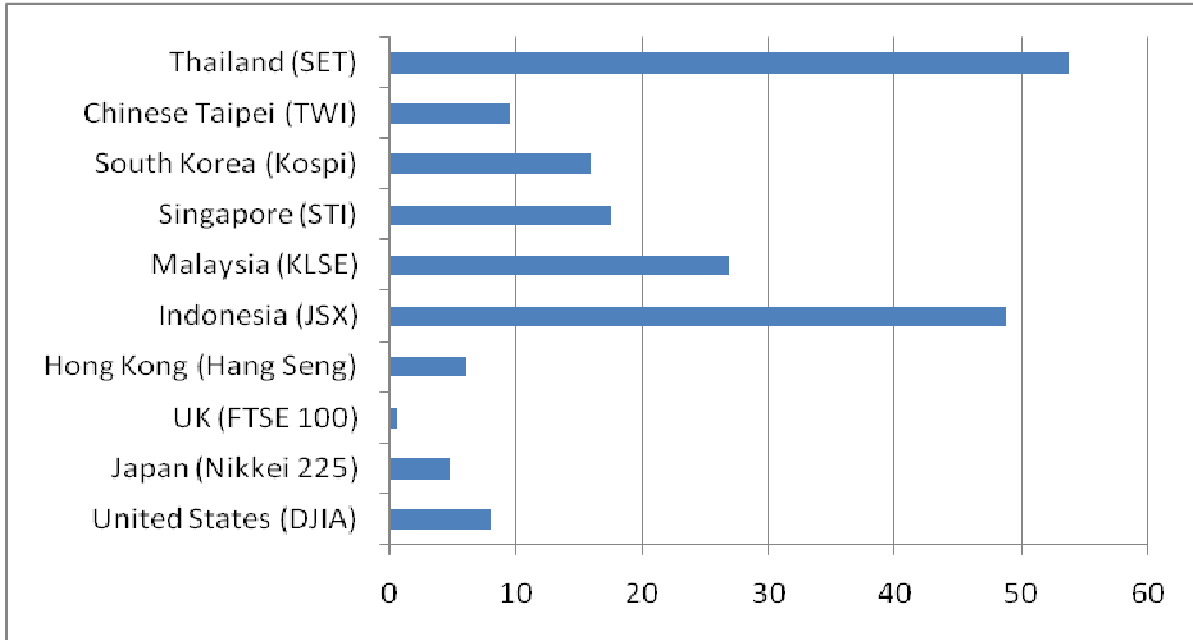
The shift in global asset allocation combined with ample domestic liquidity has led to inflationary pressures and also concerns of a return of an asset price bubble in most Asian emerging markets, including the SEACEN economies. While deflation was the source of distress among policy makers in early 2009, the rising price level has taken over the driver seat instead in regional policy debates since the first half of 2010, with very few exceptions such as Japan (Figure 4). The rapid rise of the stock market index of SEACEN economies, particular in Indonesia and Thailand, has also induced anxiety over the return of an asset price bubble in the region (Figure 5). By December 2010, the annualized returns of the Indonesian and Thai stock exchanges reached a staggering rate of around 50 percent. Bursa Malaysia (formerly known as Kuala Lumpur Stock Exchange (KLSE)) has also reported strong market capitalisation with an annual return of close to 27 percent. Strong gains have also been reported in the stock exchanges of Korea and Chinese Taipei. In contrast, there have been much more subdued profit-taking activities in the stock exchanges of developed economies such as US, UK and Japan. The UK FTSE 100 only increased, in US dollar terms, by a mere 0.5% in December 2010 from the level in December 2009.

Figure 4: The Return of Inflationary Pressures



Source: CEIC Database

Figure 5: The Return of Stock Exchange from Dec 2009 to Dec 2010
(% and US\$ term)



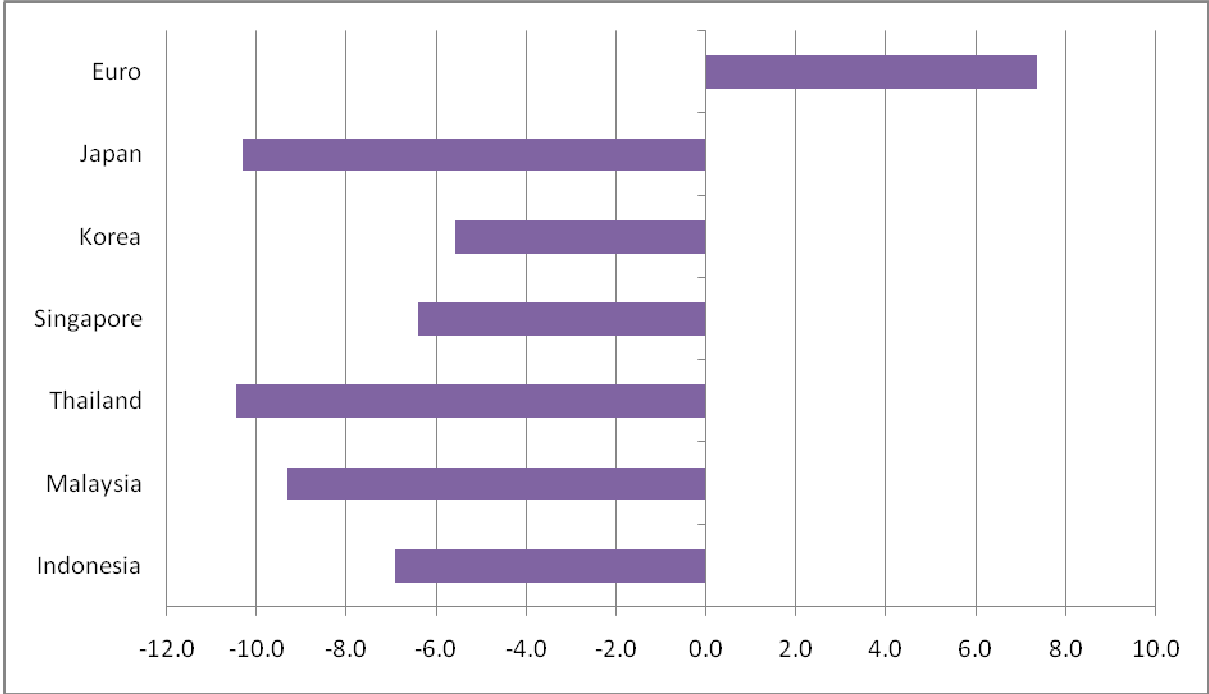
Source: Economic and Financial Indicators of the Economist Magazine, 4 December 2010.

2.1 Currency Wars: Another Round of Competitive Manipulation of the Exchange Rate?

Heightened volatility in the currency markets in some SEACEN economies has also become a familiar phenomenon in recent months. Currencies of the region appreciated as much as over 10 percent against the US dollar in October 2010 from the previous year (Figure 6). The buying pressure on most SEACEN currencies can be captured also by the exchange market pressure index. The seminal idea behind the exchange market pressure index derives from the early work of Girton and Roper (1977) in that any excess demand for foreign exchange can be fulfilled through non-mutually exclusive conduits. If the speculative attack (currency pressure) is successful, there would be a sharp depreciation of the domestic currency. However, at other times, the attack can be repelled or warded off through raising interest rates and/or drawing down the foreign exchange reserves. In doing so, a measure of the extent of currency pressure, or, an exchange market pressure (EMP) index can be constructed, which is a weighted average of the changes in the exchange rate, in foreign exchange reserves, and in interest rates. The exchange rate is said to be under 'stress' (i.e. selling pressure) if the exchange market pressure index is positive.

As demonstrated in Figure 7, most SEACEN currencies experienced buying pressure (negative EMP) for the most parts of 2008-2010, with the exception of the last quarter of 2008 and first quarter of 2009, when the currencies of most emerging markets were under selling pressure following the closure of the Lehman Brothers.⁴

Figure 6: Exchange Rate Appreciation from Oct 2009 to Oct 2010

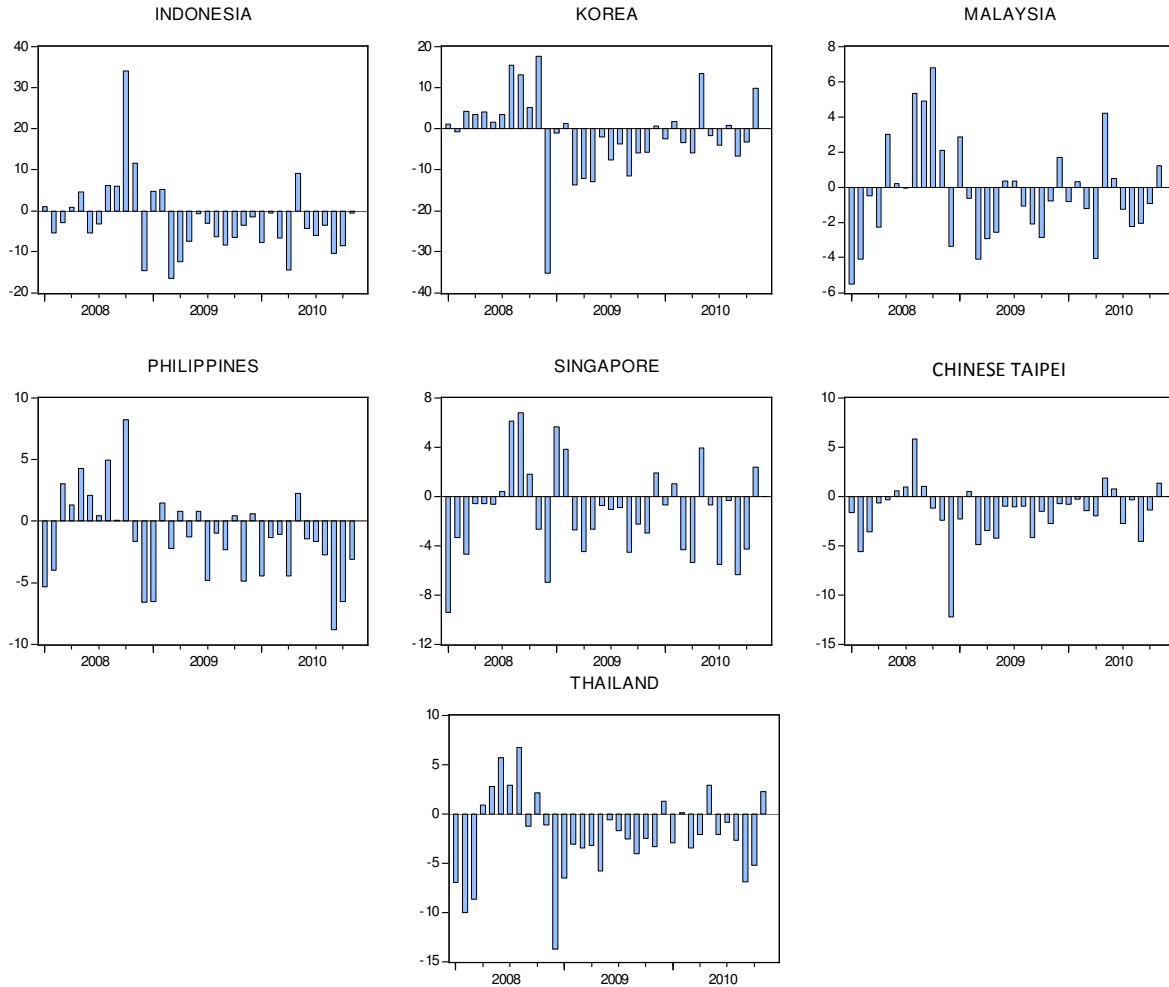


Note: (-) implies an appreciation of local currency.

Source: CEIC Database

⁴ The construction of exchange market pressure (EMP) index presented in Figure 7, follows the approach of Kaminsky, Lizondo, and Reinhart (KLR) (1998).

Figure 7: Exchange Market Pressure Index



Source: Research and Learning Contents Department, The SEACEN Centre

Under such buying/appreciation pressures, central banks around the world have been actively implementing varying degrees of intervention in the foreign exchange markets to dampen rapid appreciations of the local currency. Among the emerging markets, including SEACEN economies, sterilized intervention is a common practice. Studies have demonstrated that monetary authorities around the world have taken a closer surveillance of their currency movements and adopted a form of asymmetrical exchange rate policy stance whereby appreciation pressures are restrained more substantially than depreciation pressures (Pontines and Siregar (2010), Srinivasan, et.al. (2008) and Pontines and Rajan (2008)). The Brazilian Finance Minister, Guido Mantega, openly declared that, “we are in the midst of an international currency war, a general weakening of currency. This threatens us because it takes away our competitiveness” (The Economist 2010a). The financial press has been quick to recast global monetary conditions into battlefield terms.

From all that have transpired until this point, an all-too familiar bilateral dispute between the US and China over the alleged undervaluation of the renminbi, which has been widely considered to have contributed to large Chinese current account surpluses and, correspondingly, to large US current account deficits in recent years, has escalated and broadened into a general controversy over exchange rates and capital flows involving most developed and emerging market economies.

The first salvo in this currency war rhetoric is in the arena of foreign exchange intervention. As China now routinely diversify away from US dollar assets, it started to buy Japanese yen and South Korean won, pushing up the value of these two currencies. As a response, the Japanese started to intervene to weaken the yen (Roubini, 2010). The next stage in these wars is another round of quantitative easing as announced by the Bank of Japan (BoJ) and the more recent move by the US Federal Reserve (dubbed as QE2) to purchase \$600 billion worth of long-term government bonds. The second round of quantitative easing has further escalated the concern that the programme would only lead to a much faster appreciation of emerging market currencies against the US dollar. The concern with the future rate of inflation in the US, coupled with the interest differential between the developed and emerging market economies, suggest that US investors will shift a major part of their portfolio towards emerging economies and finance the revival of the so-called carry-trades. Such capital inflows to emerging economies present this group of economies with a dilemma. The authorities can either resist the substantial currency appreciation due to the increased inflows but face the specter of pre-East Asian crisis style asset price bubbles, or permit the appreciation of their currencies and allow the eventual loss of competitiveness. Either option is equally unpleasant. The extent of emerging markets' resistance to currency appreciations is manifested not just in terms of each other's own currency, but also the fear of individual appreciations vis-à-vis China (Pontines and Siregar (2010b)).

The problem, of course, is that economies cannot simultaneously depreciate their currencies. The iron law of exchange rates is that if one currency becomes weak in the foreign exchange market, then by definition, another currency must be stronger. Equivalently, as the global total of net exports should sum to zero, not all economies should experience surpluses in net exports. History provides us with an instructive precedent of this unavoidable basic principle. In the 1930s, in view of widespread unemployment, nations tried to export unemployment via devaluations, a policy now more commonly known as 'beggar-thy neighbour'. However, as devaluations are counteracted by a corresponding devaluation, few nations enjoyed an enduring advantage that ultimately led to a great collapse of world trade at that time and is believed to have prolonged the Great Depression (Stiglitz (2010)).

What can then lie ahead as economies pursue their own self-vested interests? The result can be damaging exchange rate volatility which can lead to a fragmented international monetary system. What is then needed to avoid this potential eventuality is a path towards a needed global adjustment or rebalancing. The demand is the will to cooperate to surmount that collective-action problem whereby an action that is in the common interest of everyone is hampered by the difficulty to coordinate the actions of each nation (Pisani-Ferry (2010)). Perhaps one approach is a more sophisticated version of the Plaza Accord in the form of a new coordinated currency pact by the core parties. Another is a more serious re-think of an earlier US proposal to set numerical targets for the respective economies' current account. This should serve as a good starting point to provide the policy framework to contain large current account surpluses and deficits, and to at least make the discussions on global adjustments far more focused.

3. Designing Transient Measures from the Current Policy Environment

Since the subprime crisis, many SEACEN central banks have implemented various policy strategies, unconventional policies included, to target various economic conditions. While the speed of recovery in the SEACEN economies may differ, many have started to withdraw such stimulus policies and begun implementing transient and exit policies aimed at normalizing macroeconomic conditions. In general, these exit policies must satisfy two aspects (Ariyoshi (2010)): financial stability and economic growth. Thus, the withdrawal of support must ensure adequate liquidity as reflected by the health and credibility of institutions. Any adjustment measure must also ensure that there is sufficient support for intermediation and credit growth and capitalization beyond solvency. Past financial crises have demonstrated that the fragility of the financial system and uncertainties may last for some time after the initial stage of the systemic financial crisis. Therefore, any consideration for a strategy to phase out the current stimulus macro-economic policies must come with a clear priority to avoid any market disruption. Policy adjustments must also be consistent with the overall medium to long-run objectives of the macroeconomic policies of the economy. In general, the implementation of such policies must involve adequate assessment of the sustainability and appropriateness of the current policy stance. The timing of implementing exit policies has to take into consideration when such policies would have longer-term impact (Manson and Mitchener (2010)). In other words, the challenges of designing exit policies are thus, to convert the current economic rebound into sustained recovery (Kuroda (2010)) and to ensure financial soundness (Zeti (2010)).

It is with this respect that the SEACEN economies, as a whole, have been vigilant in implementing exit and transient policies, taking a cautionary and balanced approach to prevent unexpected instabilities in both the financial system and the overall economy

(Table 1).⁵ On the monetary side, to ensure a smooth transition and to pre-empt the recurrence of inflationary pressures to preserve price stability, SEACEN central banks in Korea, Malaysia, Chinese Taipei, Thailand and Vietnam have raised interest rates incrementally. Similarly, the Monetary Authority of Singapore has re-centred the S\$NEER policy band upwards while restoring its modest and gradual appreciation path.⁶ Other stimulus policies implemented during the height of the subprime crisis have also been either progressively dismantled or phased out. These included, for example, the raising of the primary statutory reserve requirement and the introduction of a LDR based reserve requirement (Indonesia), the gradual withdrawal of emerging support fund and liquidity at maturity (Korea)⁷, reduction of the peso rediscounting budget (the Philippines), the winding down of the Special Risk-Sharing Initiative (Singapore)⁸ and the ceasing of interest rate subsidy for short-term lending (Vietnam). Others schemes such as the temporary full government deposit guarantees (Malaysia, Singapore and Chinese Taipei)⁹ aimed at maintaining financial stability and specific jobs credit scheme witnessed their coordinated exit in December 2010, as scheduled.

Table 1: Main Exit Policies of Selected SEACEN Economies in 2010

Table 1: Main Exit Policies of Selected SEACEN Economies in 2010	
Indonesia	The domestic economy challenges mainly associated with excess liquidity in the banking system and the large share of portfolio flows. Instead of directly implementing tight monetary policy, Bank Indonesia (BI) has taken the following measures: 1) Policy package on strengthening monetary management and financial market development. The policy package includes widening of the corridor of the overnight interbank money market rate, revisions of regulations on banks' forex net open position, implementation of the minimum one month holding period of BI certificate (SBI), introduction of the non –securities monetary instrument in the form of term deposit, issuance of the 9 and 12 month SBI and implementation of the tripartite repurchase (repo) of government debt securities; 2) Policy to raise the primary statutory reserve requirement for rupiah funds to 8% and introduction of the LDR based reserve requirement to curb mounting inflationary pressure through management of excess banking liquidity.

⁵ This, in part, reflects the importance of macro-financial linkages.

⁶ It is important for central banks to avoid the tendency to use monetary policy asymmetrically (Takagi 2009). There is a natural tendency to reduce interest rate during upturns but hold back on increasing interest rates during upturns.

⁷ The trimming down of the aggregate credit loans, provided by the Bank of Korea at preferential interest rates to promote lending to SMEs.

⁸ A scheme to stimulate bank lending and ensure that a broader segment of companies have access to credit to sustain their operations.

⁹ By December 2010.

Korea	The Bank of Korea (BOK) implemented its exit strategy, by normalizing the emergency financial accommodative measures employed so far. Most of the expanded liquidity supplies through open market operations and other measures have already been collected. Part (0.2 trillion won) of the total contribution (of 3.3 trillion won) to the Bank Recapitalisation Fund was collected at maturity (on March 31). The remaining emergency support funds in the market will continue to be withdrawn gradually. The ceiling on the aggregate credit loans which was raised by 3.5 trillion won in response to the crisis, was cut by 1.5 trillion won (on June 24). The base rate, which had been maintained at 2.0% for 17 months, was raised by 0.25% to 2.25% last July.
Malaysia	To minimize disruptions and ensure smooth transition, Bank Negara Malaysia (BNM) prepared the market for the impending policy move through direct and indirect communication channels. Subsequently, the Overnight Policy Rate (OPR) was gradually raised by 75 bps in 25 bps increments. The statements issued by BNM were carefully crafted to ensure market participants understand that the policy rate hike entailed a monetary policy normalisation, and not a tightening; that overall monetary conditions remain accommodative despite the rise in interest rates.
Philippines	The Bangko Sentral ng Pilipinas (BSP) has already reversed most of the liquidity-enhancing measures introduced during the global financial crisis given the general improvement in the domestic economic outlook along with stable domestic financial market conditions These include (1) alignment of the peso rediscounting rate equal to the overnight RRP rate by removing the 50-basis-point differential (1 Feb 2010); (2) reduction of the peso rediscounting budget from ₱60 billion to ₱40 billion, in 15 March 2010, restoring the loan value of all eligible rediscounting papers from 90% to 80% of the borrowing bank's credit instrument and bringing back the NPL ratio requirement to two percentage points (from ten percentage points) above the latest available industry average; (3) reduction of the peso rediscounting budget from ₱40 billion to the pre-crisis level of ₱20 billion (3 May 2010). While the BSP is not committed to a particular timing or sequence of actions for the exit phase, it will be guided by the following principles: safeguarding the price stability objective, timely communication, and coordination on domestic and multilateral fronts, if necessary.

<p>Singapore</p>	<p>Singapore’s exit strategies have been in line with “G20” principles: fiscal exit strategies were transparent, comprehensive, and communicated clearly beforehand. Monetary policy was unwound based on economic considerations, and other policy instruments necessary to financial stability, such as prudential measures on property transactions, were employed where needed. In view of the weakening external economic environment and continuing shocks in the global financial markets following the collapse of Lehman, the Monetary Authority of Singapore (MAS) eased monetary policy by shifting to a zero percent appreciation of the Singapore dollar nominal effective exchange rate (S\$NEER) policy band in October 2008. This was followed by a downward re-centering of the policy band in April 2009. In April 2010, MAS exited from this period of accommodative monetary policy by preemptively re-centering the S\$NEER policy band upwards and restoring its modest and gradual appreciation path. This policy stance was appropriate to ensure price stability against the return to growth in the economy and rapidly tightening factor markets. In October 2010, MAS tightened further by shifting to a slightly steeper appreciation of the S\$NEER policy band without altering the level at which the band is centred. At the same time, the policy band was widened slightly.</p>
<p>Chinese Taipei</p>	<p>The Central Bank, Chinese Taipei (CBC) has gradually withdrawn monetary easing since the second half of 2009 as several indicators including exports and industrial production exhibited significant improvement amid a steady economic recovery. To ensure that liquidity in the banking system is kept at appropriate levels, the CBC has, in addition to accepting banks’ re-deposits and issuing short-term certificates of deposit (CDs), held auctions of 364-day CDs each month since April 2010, with the total amount reaching NT\$600 billion by the end of September. As a result, net excess reserves in financial institutions fell from a high of NT\$154.1 billion in April 2009 to NT\$29.7 billion in August. Furthermore, against the backdrop of the economy’s steady recovery, upward market interest rate movements, and modest rises in consumer prices, the CBC has raised the policy rates twice by a total of 25 basis points since June. The policy rate increase will guide market rates back to normal levels gradually, consistent with the CBC’s operational mandate to maintain price and financial stability.</p> <p>During the financial crisis, the government has implemented a deposit insurance scheme with blanket coverage, which will expire on 31 December 2010. The CBC has continued to engage in the discussion and implementation of exit strategy with the FSC and the Central Deposit Insurance Corporation (CDIC), under the framework</p>

	of the “Supervising Working Group for the exit strategy of full deposit insurance coverage”. After the expiry of the full deposit insurance coverage measure, the insurance will return to limited coverage, with the maximum deposit insurance coverage amount raised from NT\$1.5 million to NT\$3 million, starting from 1 January 2011.
Thailand	The Monetary Policy Committee (MPC) of the Bank of Thailand cut its policy rate by 2.50 per cent per annum to its historical low level of 1.25 per cent per annum during the subprime crisis. At present, the Thai economy has rebounded since the second half of 2009, and the MPC started normalizing its policy by raising the policy rate by 25 basis points in both July 2010 and August 2010 meetings.
Vietnam	The authorities decided that the economic stimulus package would still be implemented to maintain economic growth, albeit at a decreasing level. For example, the interest rate subsidy continued to be applied, although decreasing in amount with limited beneficiaries, as follows: ceasing interest rate subsidy for short-term lending from 4% to 2% and interest rate subsidy for medium and long-term lending and loans to purchase machinery and equipment for agriculture production.

Source: SEACEN Survey Replies by Member Banks, October 2010

In designing exit policy strategies, domestic coordination between fiscal and monetary authorities as well as relevant financial regulators is absolutely necessary. In addition, communication of the nature of these exit policies is vital to gain the public’s understanding and avoid surprises to ensure a smooth transition (Smaghi (2010), Kohn (2009)). However, no exit policy can be totally implemented independently, without giving due consideration to international linkages (Karoda (2010)). There is a need for international and regional coordination to avoid arbitrage opportunities. For instance, as most of the SEACEN economies have begun to implement exit policies due to robust recovery, which are likely to lead to currency appreciations and possibly destabilizing capital inflows (Karoda (2010), Lee (2010)), it would be prudent to carry out greater collaborative efforts in the form of regional cooperation and coordination among the SEACEN economies. The recent lift of the blanket deposit guarantee in December 2010, coordinated by the Hong Kong Monetary Authority, the Monetary Authority of Singapore and the Bank Negara Malaysia, is a successful exemplar of the cooperation among the monetary authorities/central banks in Asia.

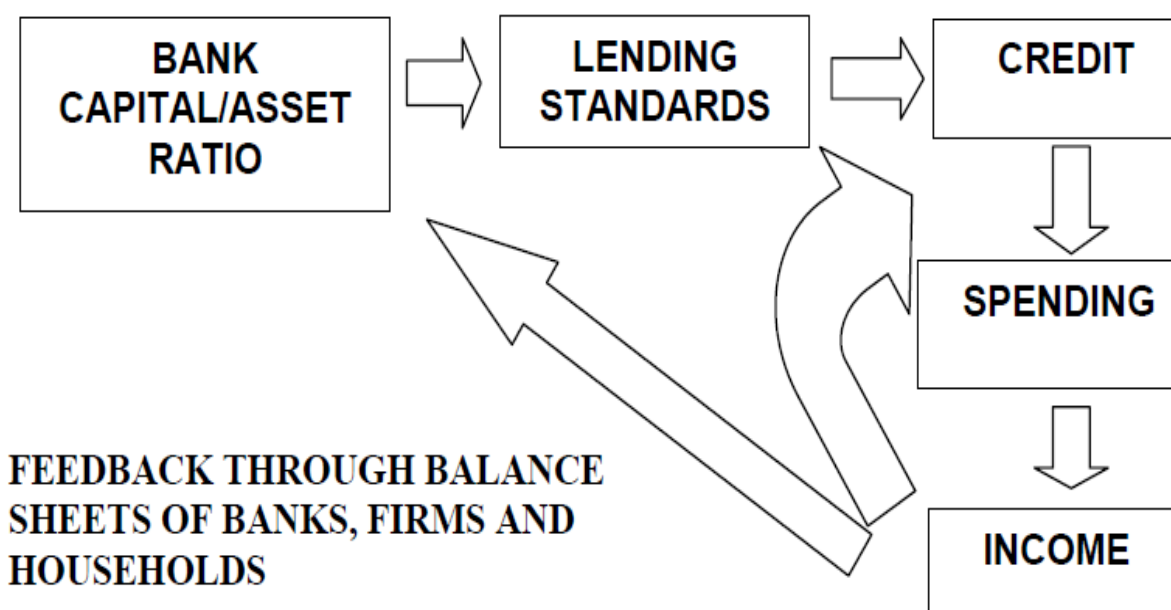
There are some fundamental challenges on the assessment of the exit policies (BIS (2009)). Firstly, due to the long lags, the assessment of the full impact of monetary policy is

likely to be extremely difficult and tricky. Secondly, various policies were initiated amid complicated fiscal and financial policy environments, making assessment of exit policy initiatives challenging. Thirdly, there is a need for the central bank to consider a specific set of criteria/indicators to assess the progress of the exit policy. Last, but not least, it is also important to recognize that SEACEN central banks, in general, have also mixed their monetary policy adjustments with a series of prudential regulations. As will be discussed in the next sections, some central banks have refrained from making frequent adjustments on their key policy rates but instead, employ a number of micro- and macro-prudential regulations to ensure better targeting of the policy measures.

4. Forging Ahead with Macro-prudential Regulations

The past decade has witnessed the rise in competition and globalisation of financial markets around the world. Consequently, as the recent global financial crisis has demonstrated, financial activities play an even more influential role in the overall macroeconomic performance of an economy. During a boom period, healthy balance sheets of financial institutions would fuel stronger credit and consumption in the economy. In turn, a rise in income and purchasing power would further induce demand for loans and at the same time increase the net worth of both assets and collaterals. The relative fall in the cost of capital will further amplify the credit boom (Figure 8). The positive feedbacks between financial sector activities and macroeconomic performance (and vice versa) are often referred to as procyclicality.

Figure 8: Framework for Macro-financial Linkages



Source: Bayoumi and Melander (2008)

Under the present global financial landscape, prudential regulations have been a key option for consideration. The importance of macro-prudential instruments is increasingly recognised with the realisation that conventional key policy interest rate manipulation is too blunt an instrument. A micro-prudentialist has long argued that for the financial system to be sound, it is necessary that each individual institution be sound. Naturally, the proximate objective of the micro-prudential approach is to limit distress on individual institutions. This approach assumes that risk is exogenous – a partial equilibrium view. In contrast, the macro-prudentialists maintain that there are situations where what is rational for an individual institution could result in undesirable aggregate outcomes. Based on the belief that risk is in part endogenous to the financial system, the objective of the macro-prudential approach is to limit the risk of financial distress with significant losers in the economy as a whole.

Despite the different views, macro and micro-prudential instruments are closely intertwined. The key part of macro-prudential instruments is to fit and blend in existing micro-prudential tools. In general, macro-prudential measures can be categorised into three primary groups. The first are price and quantity-based measures designed to limit credit expansion. Reserve requirements and credit ceilings are typical measures. The second group of regulations aims at maintaining the quality of loans. Typical measures are loan-to-value ratios, debt-to-income rules, limits on currency mismatches and improved credit information. The last group of measures focuses on the broader aspect of strengthening the resilience of the banking system to balance sheet shocks (both assets and liabilities). Capital adequacy requirement, rules on the composition and/or types of foreign borrowings are some of the measures falling into this category.

The Committee on the Global Financial System (CFGFS 2010) further classifies macro-prudential instruments by types of vulnerability in the financial system. To manage the leverage position of the banking system, capital ratio, risk weights, provisioning, credit growth, loan to value cap and maturity cap are some of the macro-prudential instruments that can be employed. As for liquidity risk or market risk, authorities can consider one or a combination of the following macro-prudential instruments such as liquidity or reserve requirement, foreign exchange lending restriction and currency mismatch limit. Last, but not least, is the vulnerability arising from interconnectedness. To mitigate this exposure, concentration limits, systemic capital surcharge and strict policy on bank subsidiary are instruments to be regarded.

The enforcement of macro-prudential measures to manage credit cycles is not a new phenomenon in Asia (Table 2). Particularly after the 1997 financial crisis episode, authorities in the region have collectively enforced macro- and micro-prudential regulations to supplement their monetary policy measures. One target area of these

policies has often been to manage loan/credit extensions to the property sector. Given the typical significant profit margins from property credit/loans, policy rate adjustments have long been found to be insufficient to address strong credit expansions. The overall primary objective of these prudential measures has also been to prevent systemic risks for overall financial stability, as experienced during the 1997 financial crisis.

Table 2: Selected Prudential Measures for Credit Booms in Asia

	LTV	Capital	Provision	Exposure Limit	Lending Criteria
Cambodia		2009		2008	
China	2001, 2005, 2006				2004
Hong Kong SAR	1991, 1997			1994-1998	
India		2005, 2008, 2009	2005, 2006, 2007	2006	2007
Indonesia		2008		2004, 2005	
Korea	2003, 2006-08				2006
Malaysia	1995-1998	2005, 2008, 2009		1997-1998	1995-1997
Mongolia		2008			
Nepal				2010	
Papua New Guinea		2003	2003	2000, 2001, 2003	
Philippines	1997, 2010			2010	
Singapore	2010			2010	
Sri Lanka		2008		2007	
Chinese Taipei	2010	Pre-2007		Pre-2007	Pre-2007
Thailand	2003				2004-05
Vietnam		2010	2010	2010	

Note: LTV: Loan to Value ratio; Capital = capital requirements/reserve requirement; Provision = loan provisioning rules; Lending criteria = limits on debt repayment-to-income, debt repayment-to-debt or credit line-to-income ratio; Exposure limit = credit exposure to a sector.

Source: SEACEN Questionnaire Survey (October 2010)

In recent years, these macro-prudential measures have been adopted to supplement macroeconomic policy measures by the SEACEN authorities to gradually shift away from the generally expansionary policy stances during the peak of the sub-prime crisis. Instead of relying on interest rate policy adjustments, a combination of loan to deposit ratio and reserve requirement policy has been enforced by Bank Indonesia, for instance, to manage credit growth and risk taking in the domestic banking sector. As in the past, the primary objectives of the recent macro-prudential measures are to manage pro-cyclicality and to reduce interconnectivity and systemic risk. To a large part, the SEACEN central banks, as in many other central banks globally, closely monitor pro-cyclical movements in debt and leverages, especially those related to asset markets such as the real estate sector. A key objective of the Singapore government, for example, is to ensure a stable and sustainable property market where prices move in line with fundamentals. In February 2010, the Loan-

to-Value (LTV) limit for housing loans extended by financial institutions was lowered to 80%. To discourage speculative flipping of properties, a Seller's Stamp Duty on all residential properties bought and sold within 1 year was introduced. In August 2010, the holding period for imposition of the Seller's Stamp Duty was increased from one year to three years. The Singapore government also tightened measures to ensure public housing is utilised as intended, i.e. for owner occupation.

Bangko Sentral ng Pilipinas has also enforced a loan to value ratio requirement as a tool to limit risk exposure of the banking sector to the real estate sector during 2010. To moderate any excessive investments and speculative activity in the residential property market; effective from 3 November 2010, new housing loans approved by financial institutions and development financial institutions to borrowers who already hold two outstanding housing loan accounts, will be subject to a maximum loan-to-value (LTV) ratio of 70%. The Adjustment LTV cap has also been pursued by the Bank of Thailand in recent years.

To manage interconnectivity and risk exposure, Bank Indonesia, for example, monitors daily liquidity positions of banks, especially those institutions that are expected to have more systemic implications. Commercial banks in Indonesia are also prohibited from extending loans to a single affiliated party by more than 10% of the capital. Prohibition on complex derivative asset trading has also been enforced by a number of SEACEN central banks. Nepal Rastra Bank, for instance, imposes limits on investments, except for government and central bank securities. Another typical prudential measure to manage interconnectivity is limiting sectoral credit, including inter-bank placements.¹⁰ The Central Bank of Sri Lanka introduced the "Direction on Maximum Amount of Accommodation" regulation in 2007 with the main objective of limiting a bank's credit exposure to any single individual or company or to any groups of individuals or companies.

A recent set of macro-prudential regulations has also been implemented to manage and address the impact of capital inflow surges, especially since the second half of 2009 (Table 3). To reduce short-term volatility, Bank Indonesia (BI) introduced a one-month holding period for its certificate (SBI) purchased in both primary and secondary markets in June 2010. Prior to this, BI launched a concerted effort to shift the maturity structure from one-month to 3- and 6-month tenors and from weekly to monthly auction. Longer maturity SBIs ---SBI-9 months and SBI-12 months--- are being considered in late 2010 with the purported aim of lengthening the maturity profile of investors. In November 2009, authorities in Korea imposed a set of tighter regulations on currency trading, including new standards for foreign exchange liquidity risk management, restrictions on currency forward transactions of non-financial companies, and mandatory minimum holdings of safe foreign currency assets by domestic banks. This set of policies followed an earlier move to curb speculative foreign exchange transactions. In July 2010, the minimum amount of deposits for foreign currency margin trade was raised to 5 percent of transaction value from 2 percent, in an effort to clamp down on speculative foreign exchange trading by

¹⁰ The Bank of Papua New Guinea has imposed prudential standard on limits on inter-bank placements.

individual investors. A number of SEACEN economies, such as the Philippines and Thailand, have made it easier for domestic residents to invest abroad. Easy access to foreign investments has long been one prescribed measure to mitigate the impact of capital inflows on the domestic economy.

Table 3: Selected Capital Account Prudential Measures

Economies	Policy Measures
Indonesia	Requiring one-month minimum holding period for Bank Indonesia Certificates (SBIs) of all maturities (July 2010).
Korea	Limit on bank's foreign exchange forward positions; cut ceilings on companies' currency derivative trades and minimum holding period. Raised the cost of foreign currency margin trade.
Malaysia	Raised overseas investment limit of the Employee Provident Fund (EPF) (October 2010).
Chinese Taipei	Limit on foreign investors' investment on government bonds and money market products. Banks' holdings of non-deliverable forwards and options in the NT dollar will be limited to 20 percent of their positions in the local currency
Thailand	-Raised the amount that foreign-currency exporters can hold abroad; relaxed foreign-currency limit on bank accounts in Thailand; relaxed regulation on resident investments abroad (properties and FDI) (October 2010). -Introduced a 15% withholding tax on interest income and capital gains on fixed income investment by non-residents (October 2010)

Source: Official Websites of Member Central Banks

Going forward, a number of issues remain to be resolved. Should these macro-prudential policies be implemented on a transparent rule based approach? This is a familiar question and has long been debated for monetary and fiscal policies. For both fiscal and monetary policies, we have learned that the fixed rule and discretion approaches offer their own distinct advantages. It is likely that a combination of these approaches could maximize the effectiveness of macro-prudential regulations. The proponent of the rule-based system claims that this approach aligns the expectations of market and policy makers so that policy is transmitted quickly and effectively to the economy. However, if any lesson can be drawn from the recent global financial crisis, it is that financial institutions have been very adept at gaming rule-based systems and that there are enough incentives for risky financial activities outside the perimeter of supervision and regulation (Yellen (2010)). Furthermore, financial institutions and their activities will evolve in ways that may limit the ability of the rule-based system to address all emerging systemic threats. Hence, a certain degree of discretionary measures to a generally rule-based approach are potentially warranted here.

Another consideration relates to the need for extensive international cooperation in designing and implementing these macro-prudential measures. A rising concern now is with rule arbitrage. If one economy were to go it alone with tough and comprehensive measures, it is likely that we would see financial institutions fleeing the economy to another with softer policy stances and hence, the importance of international commitment

and cooperation to develop and implement coherent and comprehensive approaches. Lastly, to what extent should monetary policy be coordinated with macro-prudential regulation, especially with macro-prudential supervision? This issue remains a contentious one around the globe. Macro-prudential measures will undoubtedly have macroeconomic spillovers. Therefore, authorities must strive to ensure that monetary policies and macro-prudential regulations, including supervisory ones, work in a coherent manner. Hence, should these monetary and macro-prudential regulations and supervisory policies be closely integrated and assigned to the central bank? We will return to these two pertinent issues in the latter part of the paper.

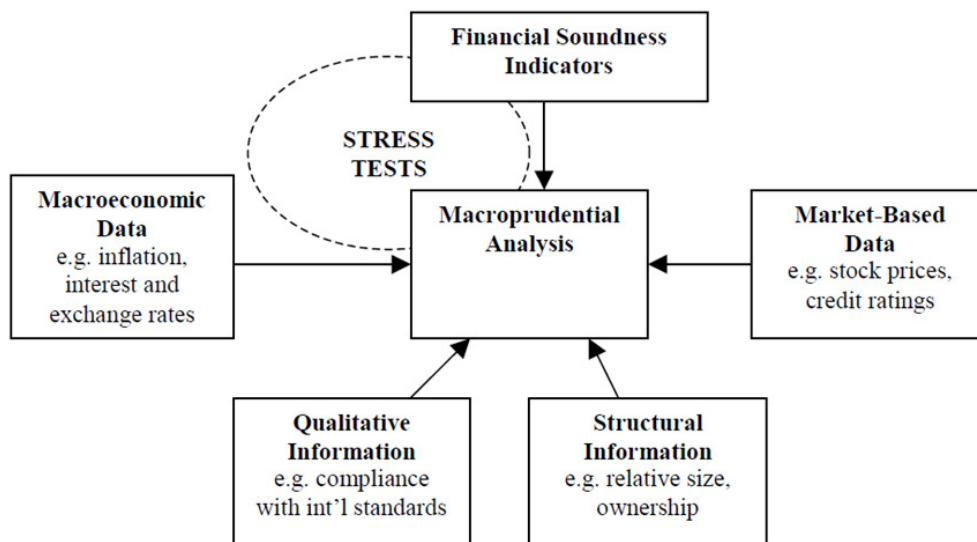
5. Stress Testing: An Effective Approach?

5.1 Why Stress Testing

From the many continued debated definitions of financial stability, it is obvious that financial stability is neither a state of equilibrium nor is it ever static. It may continue to evolve, moving along a continuum and is consistent with what is known as “a perpetual state of flux and transformation” (Schinasi (2004, p.8)). Given this situation, it is important for supervisors to assess and determine whether the financial system is potentially entering or is already in a range of instability. In the past, the main focus has largely been to strengthen and develop further key financial stability indicators. While these indicators are useful, there is one critical shortcoming. These indicators are static and only capture the present conditions of the financial institutions’ balance sheets. On the other hand, the basic idea of stress testing is based on the macro-financial linkages (Figure 9) where the state of the “financial system is inextricably intertwined with the performance of the economy and its resilience to shocks” (Trichet (2005)). Stress testing (ST) examines financial institutions’ balance sheet indicators corresponding to exceptional but plausible events in the near future.¹¹ As a forward looking instrument/tool, ST not only adopts the same set of financial stability indicators, but also focuses on the present/contemporaneous stage - the balance sheets of the financial institutions exposed to various possible financial and economic shocks, domestically and externally. The ST results would provide a range of financial indicators associated with those future different plausible shocks.

¹¹ ST which allows macroprudential supervisory perspective to be married with the insight gained from microprudential supervision on firm-specific information to analyse systemic risks and emerging stress has now been accepted as one of the most integral components of the macro-prudential tools in recent years (Tarullo (2010)).

Figure 9: Framework for Macroprudential Analysis



Source: Sundararajan & et. Al. (2002).

In general, there are at least six ways to stress test a financial institution (BIS 2000).¹² These are:

1. Sensitivity test in which the impact of the portfolio of the financial institutions is determined following a predefined change in a particular market risk;
2. Scenario analysis for which risk factors may change due to foreseeable (plausible) future events;¹³
3. Maximum loss approach for which a scenario is conceived based on the worst possible scenario;
4. Extreme value theory (EVT) for which the occurrence of extraordinary event(s) is conceived;¹⁴
5. Contagion analysis to take into account the transmission of shocks from individual financial institution's exposures to the financial system as a whole (Čihák (2004));¹⁵

¹² ST can be divided into "piecemeal" approach where vulnerability is evaluated based on a single risk factors or an integrated approach where multiple risk factors are involved (Sorge (2004)). Early versions of ST were based solely on the micro-prudential approach where the only concern was the assessment of individual institutions. More sophisticated models have appeared in recent years to assess and monitor the strengths and vulnerabilities of the overall financial system as well. In this respect, ST has come to be known as macro-prudential stress test. Crockett (2000, p. 29) defines the objective of macro-prudential as "limiting the likelihood of the failure, and corresponding costs, of significant portions of the financial system. This is often loosely referred to as limiting systemic risk".

¹³ One method is to basically replicate historical episodes of stress, such as Black Monday in 1987, 1997 East Asian crisis and the 9/11 terrorist attack.

¹⁴ EVT is notable for being the only stress test technique that attempts to attach a probability to stress test results (BIS (2000)).

6. Reverse stress testing, for which the scenario is of a total bank collapse (render the business model unviable) and the financial institutions undergoing the stress test are required to work backwards to determine risks and vulnerabilities and to identify circumstances where this might occur. This, in effect, is completely different from the original stress test methodologies (1-5 above) where the outcomes are the results of changing circumstances (FSA (2010)).

ST can be carried out via two approaches (Table 4). The first one is known as a top-down approach, while the second one is the bottom-up approach. The top-down approach is conducted by the supervisor of the banking sector. Given available data supplied by the member banks to the supervisor, different stress-test scenarios to measure credit risk exposures, in particular, of individual banks and the overall banking system, can be performed. Since it is executed and designed by a single institution (the supervisor of the banking sector for instance), the results of each bank are comparable. Furthermore, given the availability of data, this approach should be able to capture potential contagion effects.

Table 4: Summaries of Top-Down versus Bottom-Up Approaches

	Top-Down Approach	Bottom-Up Approach
Conducted by	Central bank or supervisory agency developing the tools	Individual banks developing their own tools or using their internal models
Data	Using aggregate data of each bank or banking system available at the central bank	Using sub-portfolio/portfolio-level data or customer data of individual banks
Impact Analysis	Assessing the impact of stress scenario on individual banks and banking system's portfolio quality and capital position	Assessing the impact of stress scenario on financial statements of each customer, then aggregating the impacts to find overall impacts on each bank's portfolio and capital position
Pros	It is effective for examining credit risk. Stress test results can be compared across banks. It covers broader perspectives, including feedback effects from the financial system to the macro-economy, and contagion.	Due to its tailor-made nature and richer data sets, it can better reflect the market and liquidity risk profiles of each bank's portfolio.
Cons	Results may not reflect each bank's risk profile well.	With different methodologies used by each bank, it is difficult to compare the results across banks.

Source: Subhaswadikul (2010) and Zhu (2010)

¹⁵ The contagion effect where the inter-linkages of inter-bank exposures is explicitly taken into account allows the stress testing to evaluate the importance of individual shocks over the entire financial systems and this provides a more realistic account of possible domino effects (Sorge (2004)). The so-called "dynamic" effect is based on an iterative approach which may allow factors such as the interaction for management decisions, asset sales and liquidity hoarding (e.g., endogenous risk created between the interaction among credit, market and liquidity risk) (Haldane (2009)).

On the other hand, bottom-up stress-testing is carried out by the individual banks, where scenarios are pre-defined by the supervisory authority. The advantage of this approach is the richer data sets and more comprehensive understanding of market and liquidity risks of banks. Comparing the outcomes of the bottom-up approach, however, can be an arduous task. In the bottom-up approach, each bank has the latitude to select its own methodologies and to apply their own unique databases. Kishan and Opeila (2000) demonstrated that loan supplies of poorly capitalised banks reacted more sensitively compared to well-capitalised peers. If the financial stability of individual banks differs, the monetary transmission of monetary policy is likely to be adversely affected (De Graeve & et.al. (2008)). Furthermore, this approach, due to the data limitation on the overall banking system and its focus on individual banks, will not be able to comprehensively capture the contagion effect and the macro-financial feedback effects. Therefore, the standard practice would be to perform both top-down and bottom-up approaches.

Under Basel II, stress-testing is an integral part of both Pillar 1 and Pillar 2.

1. Under Pillar 1 on minimum capital requirement, stress-testing is a vital instrument to assess credit risk, market risk and operational risk. Furthermore, the Pillar 1 framework requires banks to use the Internal Models Approach to determine the market risk capital to have in place a rigorous programme of stress testing. Similarly, banks using the advanced and foundation internal ratings-based (IRB) approaches for credit risk are required to conduct credit risk stress tests to assess the robustness of their internal capital assessments and the capital cushions above the regulatory minimum.
2. Under Pillar II on Supervisory Review Process, stress-testing is required to measure interest rate risk, credit concentration risk (potential over-exposures to a specific class of asset, borrower, industry or region), and counter-party credit risk.

Thomas and et.al (2009) note that under the current regulatory framework of the Basel Committee on Banking Supervision (2005), stress testing must meet three requirements: plausibility of stress scenarios, severity of stress scenarios, and suggestiveness of risk-reducing actions. However, in practice, there are several obvious limitations of a stress test. A typical stress test does not present the probability of an event occurring (rather it estimates the exposure of it to specific events) (BIS (2000)). Many advanced ST models now include feedback mechanism between the financial and real sector. However, in practice, due to data limitation and cost in data collection, these feedbacks are often ignored or foregone.¹⁶ Using ex-post information on stress testing and financial crises, Alfaro and Drehmann (2009) find that often stress scenarios are just not severe enough, especially when these crises are not superseded by weak macroeconomic conditions. They suggest that scenario assumptions should be severe enough but “ex-ante are not beyond the realm of possibility” (Alfaro & Drehmann (2009), p.30)). Recently, Thomas and et.al (2009) propose a methodology to identify a region of plausibility in terms

¹⁶ Haldanc (2009) also notes that so far, not many attempts have been made to incorporate a comprehensive dynamic approach to stress testing.

of risk-factor distribution and calculate a precise trade-off between plausibility and severity. In this way, only harmful but plausible scenarios are captured, giving credibility to the stress test. Even then, Alfaro and Drehmann (2009, p.39) find that many stress testing models do not perform very well before and during crises as many of these models (even with feedback mechanism) fail to capture extraordinary “crisis dynamics” such as bank runs, interbank market freezes and credit rationing. At present, most stress testing methodologies do not cover certain risks in sufficient detail.¹⁷ These include as noted by the BIS (2009): (1) behaviour of complex structured products under stressed liquidity conditions; (2) basis risk in relation to hedging strategies; (3) pipeline or securitisation risk; (4) contingent risks; and (5) funding liquidity risk. Therefore, even with ST results, it may be difficult to suggest effective risk-reducing actions.

5.2 Specific Issues and Challenges: Experiences of Asia

The efforts of conducting stress testing on a regular basis have gained momentum during the last few years, largely attributable to the recent sub-prime crisis. However, in many developing economies, including those in Asia, stress testing is still at its infancy. Major East and Southeast Asian economies, such as Indonesia, Malaysia, the Philippines, Chinese Taipei, Thailand, Singapore and Hong Kong have all started with various sensitivity tests immediately after the 1997 financial crisis. Some Asian economies have started conducting macro-prudential surveillance (Financial Sector Assessment Programs (FSAPs) with macro stress testing as an essential component) of their financial systems jointly with the International Monetary Fund and the World Bank. At the early stages of implementation, the stress-testing for these economies was done externally by the IMF team. However, since late 2006, the central banks and monetary authorities have begun to implement basic modifications of the FSAP model. The case of Thailand is summarized in Table 5, representing the general process taking place in Indonesia, Malaysia and the Philippines. In addition, a number of SEACEN central banks have also recently embarked on a similar effort. The Central Bank of Sri Lanka, for instance, officially launched its quarterly stress-testing in 2009. On the other hand, Nepal Rastra Bank only initiated a trial stress-testing on commercial banks in early 2010.

¹⁷ In recent years, risk monitoring of financial institutions is getting more difficult due to the growing complexity and diversification of these institutions (BIS (2000)).

Table 5: Bank of Thailand's Milestones on Stress-Testing

<p>2007:</p> <ul style="list-style-type: none"> • Participated in the stress-testing component of the Financial Sector Assessment Program (FSAP), a joint undertaking by the IMF and the World Bank. • Developed Macroeconomic Credit Risk Model to be used in top-down assessment of macro-credit scenarios
<p>2008:</p> <ul style="list-style-type: none"> • Issued supervisory scenarios, including sub-prime crises; various macro-credit scenario, market and liquidity scenario to commercial banks. These banks were expected to assess impacts via bottom-up approach.
<p>2009:</p> <ul style="list-style-type: none"> • Required foreign bank branches in Thailand to perform liquidity stress testing in second half of 2009. • Issued Pillar 2 guidelines which include stress-testing in the second half of 2009.
<p>2010:</p> <ul style="list-style-type: none"> • Developed examination guidelines for credit risk, market risk and interest rate risk in banking book and liquidity stress testing. • On-going development of sectoral credit risk models, namely, corporate model, personal loan model, real estate loan model and housing loan model.

Source: Subhaswadikul (2010)

It is worth highlighting that prior to 2007, the sensitive stress testing technique was predominantly employed. Only in 2008 and 2009 was different scenario testing explored to test various risks such as credit, liquidity and market risks by the central banks and monetary authorities in East and Southeast Asia. For credit risk, a number of scenario shocks are similarly shared in these economies (Table 6).¹⁸

There are several immediate challenges for the overall improvement of stress-testing by the Asian central banks and commercial banks, particularly in the emerging markets. First is data and model limitation.¹⁹ In Asia, the models are still relatively simplistic, mostly in the form of linear model equations, which may be suitable for examining risk exposures during normal economic conditions, but not during a crisis. Second, these models, quite apart from models being applied in developed economies, have not incorporated even the basic feedback mechanism to take into account the second-round effects and the critical systemic effects. Third, different risks are still frequently being treated and evaluated separately ---or by what is also known as sensitivity test. Not surprisingly, the data and model limitations are the fundamental weaknesses in

¹⁸ The implementation of foundation internal rating base (IRB) for examining credit risk in major economies in Asia and Pacific, in general, is still in a very early stage. For most parts, the Standardized Approach has been implemented, but the datelines to push for foundation IRB and advanced IRB vary from 2008 to 2010 for most economies, with the exception of India which is 2012-2014.

¹⁹ For stress testing to be successful, central banks may need a suite-of-models to make use of all relevant data. E.g., at Norges Bank where the suite-of-models approach is employed to take advantage of several data sets. The stress testing models consist of a small macro model and micro data models for companies, households and banks (Andersen (2008)).

infrastructure and have been found to limit the ability of banks to identify and aggregate exposures across the wider financial system (BIS (2009)).²⁰ It is also noted that the lack of high frequency and long time-series data at disaggregated levels prevent efforts to expand scenarios that can be tested, and therefore the comprehensiveness of the analyses that can be generated.

Table 6: Selected Macroeconomic Scenarios Considered for Credit Risk Stress Testing

Economies	Scenarios
Hong Kong	Ranges for baseline and stress scenario via: (1). Domestic GDP growth rate; (2) GDP growth rate of main-land China; (3). Interest rate; and (4). Property price.
Indonesia	(1) . A shift in credit collectability to lower level by 20 percent each; (2). A rise in the interest rate by 100 bps; (3). Rupiah depreciation by 20 percent from the foreign exchange maturity profile of less than three months; (4). Price of government bond drop by 20 percent; and (5) Drops in real domestic GDP growth rate.
Malaysia	Macroeconomic parameters that are comparable to historical worst levels such as the 1997 East Asian financial crisis, the 2001 dot-com bubble and the 2003 SARS outbreak. External factors such as prolonged slowdowns of global and regional economies.
Philippines	Ranges for baseline and stress scenario via: (1). Domestic GDP growth rate; (2). Interest rate; (3). Inflation rate; (4). Remittance growth rate; (5). Exchange rate (against the US dollar).
Singapore	Various macroeconomic shocks; shocks to global economy; dividend payouts and earning projections over stress horizon.
Chinese Taipei	(1). Fall in revenues of corporate borrowers; (2) Decline in real income of household borrowers; and (3) Decline in real-estate collateral.
Thailand	Ranges for baseline and stress scenario via: (1). Domestic growth rates of GDP and its various components; (2). Interest rate; (3). Inflation rate (core and headline); (4). Exchange rate (against the US dollar); (5). Crude oil price; (6). Trading partner GDP growth rates.

Source: Financial Stability Reports of the Central Banks and Monetary Authorities (various years) and SEACEN Survey, Oct 2010

Another critical shortcoming with the implementation of the stress-testing efforts among the commercial banks in Asian emerging markets has been the lack of appreciation and commitment of commercial banks' senior management. This weakness, however, is wide spread globally and not unique to Asia only. BIS (2009) notes that stress testing is often done with little interaction with the management as they often believe that the analysis is not credible. It is often the case that the commercial banks carry out internal

²⁰ It is recognised, however, that the complexity and the sophistication of the models do not necessarily guarantee the comprehensiveness of the results.

stress testing mainly to comply with the requests of the supervisory authority. In July 2008, the Final Report of the IIF Committee on Market Best Practices: *Principles of Conduct and Best Practice Recommendations* published by the International Finance underscored that for ST to have a meaningful impact on business decisions, the board and senior management ought to play an active role in evaluating stress test results and their impact on the bank's risk profile.

By the same token, for the ST to be a credible one, the monetary authorities must ensure transparency of the whole process. An important aspect of stress testing for consideration is the disclosure of results.²¹ Stress testing results may be disclosed to the public in three ways (Tarullo (2010)). Firstly is by full disclosure of the release of detailed information about the methodology and banks' specific outcome. Secondly is through the release of detailed information but without specific results of individual banks which is towards a more systemic approach. Thirdly is the release of aggregate results with forward looking assessments of the overall financial system.

How far would the central banks publically disclose the process and the outcome of stress-testing? Would the Asian central banks/bank regulators go as far as publishing the test results for each individual bank (as in the case of the Supervisory Capital Assessment Program (SCAP) in the United States during the first quarter 2009) or would they just release the aggregate results of the test – without revealing how individual banks fared (as in the case of the European Union (EU) bank stress testing results in 2009)? Definitely, encouraging financial institutions to disclose and publish stress testing results can help to improve financial market understanding (Haldenc 2009). However, it is also important to realise that over disclosure may be damaging, especially for economies that are heavily reliant on the role of banks as financial intermediaries (e.g., in Europe and Asia versus the US) (Nagy 2009). Due to its complexity, industry practitioners caution against the risk of misinterpretation of stress test results by the public (Polleit, quoted in The Local (2010)). Ackerman, the CEO of Deutsche Bank AG also argues that if the support mechanisms are not made explicit beforehand, making stress tests public would be “very, very dangerous” as it could lead to greater uncertainty and could even potentially destabilise markets (Ackerman, quoted in Kirchfeld and Clark (2010)). Having said that, Nagy (2009) points out that past experiences have demonstrated that market reaction to stress test results has been positive. In the same vein, Tarullo (2010) also argues that the more frequent the release of the stress test results, the better for the market as frequent detailed disclosure can result in less unpleasant major surprises.

Table 7 reveals some of the features of participation, frequency and dissemination process of stress testing among selected SEACEN economies. As expected, there is a range of stress testing practices being implemented in these economies. To ensure comprehensiveness of the testing, at least 60 percent, and as much as 100 percent, of the commercial banks are required to participate. Thailand and Chinese Taipei carry out the testing on an annual basis, while others have chosen to push for a more frequent

²¹ To restore confidence in European banks, the European Union leaders agreed in June 2010 to publish the results of the bank stress tests in July 2010.

examination (quarterly and monthly). Based on the survey conducted by The SEACEN Centre, a fair share of the SEACEN central banks still have no plans to publically disseminate the results of the testing. Bank Indonesia, Bank Negara Malaysia and Bangko Sentral ng Pilipinas partially disclose the aggregate results via their Financial Stability Review reports.

Table 7: Participation, Frequency and Dissemination of Stress Testing in Selected SEACEN Economies

Economies	Number of Institutions Participated	Frequency	Public Dissemination of Results
Indonesia	100%	Monthly for credit, market and liquidity risk. Quarterly for macro-risk analysis.	Partial disclosure (no name of institution) via Financial Stability Review report
Malaysia	100% of financial institutions under the supervision of BNM.	Quarterly by financial institutions and semi-annually by Bank Negara Malaysia.	Partial disclosure (no name of institution) via Financial Stability Review report
Philippines	Top 10 (out of 38) Universal and Commercial Banks --- around 62% of the Philippines Banking System in March 2010	Quarterly	Partial disclosure (no name of institution) via Financial Stability Review report
Singapore	20% of total banks (or more than 65% of the total banking system)	At least annually	No
Sri Lanka	All commercial banks	Quarterly	No
Chinese Taipei	92% of domestic bank, covering 98% of total domestic bank asset.	Annually	No
Thailand	100% of local bank, covering of 80% of total portfolio of each bank.	Annually	No

Source: Financial Stability Reports of the Central Banks and Monetary Authorities (various years) and SEACEN Survey Oct 2010.

5.3 Greater Involvement of Bank Supervisors in Stress Testing

In summary, stress testing allows for benchmarking across financial institutions (Haldane (2009)) as it provides a coherent and consistent framework for assessing systemic risks and is a potential starting point for assessing potential financial stability threats (Bunn & et.al (2005)). It can also provide forward-looking assessments of risk and information on the setting of a banks' risk tolerance (BIS (2009)), compelling bankers to mull over the consequences of the risks certain plausible events can bring about (Bernanke (2010)). In addition, it can serve as a communication tool (Hosoya & Shimizu (2002)) supporting internal and external communication (BIS (2009)), for e.g., creating public and management awareness (BIS (2009), Alfaro & Drehmann (2009)) while at the same time

providing transparency to regulators and financial markets, feeding into firms' liquidity and capital planning (Haldane (2009)).

There is little doubt that despite the limitation, even basic stress tests can provide supervisors with some kind of indicators for the identification of vulnerabilities, risks and weaknesses of the supervised entities. Having said that, it is important for supervisors to recognize the limitation of stress testing modeling, particularly when feedback effects are not explicitly modeled. In particular, supervisors need to encourage greater participation by management of supervised entities to identify systemic vulnerabilities. On their part, supervisors must also be prepared to provide clear policy guidelines related to stress testing results such as follow-up measures to address the outcomes of the stress-testing, adjustment in capital adequacy positions and other possible regulatory actions.

Supervisors also need to fully understand the changing nature of financial business. Supervisors are thus challenged to improve data availability, depth of analysis, methods and models for the purpose of a forward-looking assessment of the financial system, in particular in terms of stress testing exercises and monitoring tools. For example, in the SEACEN economies, most macro stress testing models are yet to be tailor-fitted to the domestic financial systems. SEACEN central banks also face the lack of adequate human resources and expertise to deal with the rapid market developments and innovations as well as in keeping up with new international regulatory standards such as Basel III and the new accounting FRS139 requirements.

Given the interconnectivity of the financial sector to the corporate and household sectors, should the central bank/monetary authority also consider conducting stress testing on these two sectors as well? In particular, recognizing the rising trend of household and corporate debts and their exposures to the banking sector, the Bank of Thailand, for instance, has started to conduct stress testing on the household and corporate sectors to better manage the financial system for stability.

A comprehensive analysis of stress testing results may require systems thinking beyond national borders by taking into account international linkages and dynamics. As the recent case of structured credit and credit derivatives markets shows, the scale of cross-border banking is becoming increasingly large and this has the potential to transmit shocks from one economy to another on a large scale. Currently, stress testing modeling has not reached that level of sophistication to take into account cross-border dynamics.²² However, supervisors can share vital cross-border information regarding their domestic financial situation. Various aspects pertaining to cross-border banking issues will be discussed next.

²² A promising approach is the Agent-based Modelling where agents' behaviour is explicitly modeled to include direct interaction among themselves. For instance, the feedback mechanisms can amplify small effects, such as "bank runs" into significant events, i.e., these 'non-linear effects' are not proportional to their causes (The Economist (2010b)).

6. Coordinating Supervision at National Borders and Beyond

6.1 Supervision at National Borders

Following the 1997 Asian financial crisis, there was and still is much debate on the need to enhance supervisory capacities of financial institutions. New developments in the banking industries imply that they are not only confined to the traditional business of lending and providing avenues for deposits but are also actively expanding their ambit into investments and even insurance services. Supervisors may also encounter challenges in supervising the activities of licensed banks and registered finance companies that belong to large conglomerates whose total operations do not fall under the purview of the central bank. This is one of the regulatory ‘blind-spots’, that can occur when prudential and supervisory policies are not consistently implemented across different groups of financial institutions. This is well illustrated by past crises and the current sub-prime crisis. Naturally, this calls for a more integrated domestic financial supervisory system to keep up with the advancement of the banking sector (Siregar & James (2006)).

Yet, there is a wide range of supervisory models being used today, ranging from a fully integrated model with complete supervisory functions in all sub sectors to the “twin peaks” model (where one agency is responsible for (macro) prudential supervision and the other for business conduct (micro) supervision) and no sectoral integration (where various supervisory bodies are independently responsible for their own sector(s)) (Čihák & Podpiera (2008)). The statutory supervisory functions could either reside fully or partially within the central banks. For SEACEN economies, supervisory roles of the financial institutions are generally shared in most cases by multiple institutions (Table 8). With the exception of Bank of Korea and Central Bank, Chinese Taipei, the rest of the SEACEN central banks and monetary authorities hold the supervisory role for the banking system while the security and exchange commission oversees the capital market. The Monetary Authority of Singapore has a unique position as it assumes the role of an integrated supervisor of all financial institutions in the economy. Similarly, under the new 2009 Central Bank Act, Bank Negara Malaysia has the mandate to conduct a wide range of supervision on banks and non-bank financial institutions. In most of the other SEACEN economies, such as Cambodia, Indonesia, Nepal, Thailand and Vietnam, the Ministry of Finance plays a critical role as well.

**Table 8: The Structure of Supervisory Arrangements
in Selected SEACEN Economies**

	Authority	What Institutions are being supervised?	Scope of supervisory functions(e.g. prudential supervision, corporate governance, consumer protection etc)
Cambodia	Central Bank	Banking system in Cambodia, external audit companies, leasing companies, money and payment service providers	Prudential supervision Consumer protection
	Ministry of Finance	Insurance companies	Corporate governance
Fiji	Central Bank/Monetary Authority	Banks, Credit Institutions, Life & Non-Life Insurance Companies, Insurance Brokers, Insurance Agents, Foreign Currency Dealers and Money Changers, Pension Fund, Capital Markets Development Authority (CMDA)	Prudential supervision, corporate governance, setting of supervisory policies and regulations, customer complaints, licensing
	Securities Commission	Brokers, dealers, investment advisers, unit trusts, securities exchange and central depositories.	License capital markets participants, inspections, investigations, issues policy and rules, and provide advice to Government on operation and development issues for the capital markets.
Indonesia	Central Bank	All banking institutions (until end of 2010).	
	Bapepam-LK (under Ministry of Finance)	Non Bank Financial Institutions (capital market and insurance)	Securities regulation
Korea	Central Bank/Monetary Authority	Commercial banks	Macro-prudential regulation and micro-prudential supervision via indirect means with participation in joint on-site examination with FSS
	FSC, FSS	All financial institutions	Prudential supervision
Malaysia	Central Bank/Monetary Authority	<ul style="list-style-type: none"> • Commercial banks • Islamic Banks • Investment Banks • Development Financial Institutions • Bank holding companies (limited regulation) • Insurance companies • Other systemic non-financial institutions (if deemed necessary). 	<ul style="list-style-type: none"> • Continuous surveillance which includes on-site and off-site supervisory functions based on risk based supervisory framework. • Perform consolidated supervision to better understand risks and exposures that cuts across legal entities and business lines. • Conduct risk assessment of

	Authority	What Institutions are being supervised?	Scope of supervisory functions(e.g. prudential supervision, corporate governance, consumer protection etc)
			<p>significant activities of the financial institutions.</p> <ul style="list-style-type: none"> • Conduct stress tests to ascertain resilience levels of financial institutions in terms of capital and liquidity. • Approval of new products, new branches and appointment of external auditors, directors and senior management staff and annual financial accounts.
Nepal	Central Bank	Commercial banks, Development banks, Finance companies, Micofinance development banks.	Licensing, regulation and prudential supervision, corporate governance, consumer protection
	Ministry of Finance	Being public enterprises subject to government rules/regulation.	Being public enterprises subject to government rules/regulation.
	Security Exchange Board of Nepal (SEBON)	Stock Market	Protection of Investors' interest.
	Others		
	1. Insurance companies	Insurance Board	Regulation, supervision, monitoring and consumer protection.
	2. Cooperatives	Cooperative Board	
Papua New Guinea	Central Bank	Banks, Licensed Financial Institutions, Savings and Loan Societies, Microfinance Institutions, Money Changers, Superannuation, fund administrators, investment managers, and Life Insurance Companies & life insurance brokers	<ul style="list-style-type: none"> • Prudential Supervision – onsite, offsite, enforcement • actions, policy formulation and licensing of institutions • Corporate Governance • Depositor/ Policy Holder Protection
Philippines	Central Bank	Banks and non-bank financial institutions with quasi banking functions, pawnshops, NSSLAs	Prudential supervision, corporate governance, consumer protection
	Securities & Exchange Commission (SEC)	All corporations, partnerships or associations who are the grantees of primary franchises and/or a license or permit issued by the Government, as well as financial institutions that are required under special laws	Prudential supervision, corporate governance, consumer protection

	Authority	What Institutions are being supervised?	Scope of supervisory functions(e.g. prudential supervision, corporate governance, consumer protection etc)
		to be under the supervision of the SEC	
	Insurance Commission (IC)	Insurance companies, mutual benefit associations, and trusts for charitable uses, adjusters and intermediaries	Prudential supervision, corporate governance, consumer protection
	Philippine Deposit Insurance Corporation (PDIC)	Exercises complementary supervision of banks.	Prudential supervision, corporate governance, consumer protection
Singapore	Integrated Supervisor (and Central Bank)	MAS is an integrated supervisor overseeing all financial institutions in Singapore – banks, insurers, capital market intermediaries, financial advisors, and major market infrastructure like clearing and payment systems, including the stock exchange.	Prudential Regulation, Prudential Supervision, Macroeconomic Surveillance, Market Conduct, Consumer Education
Sri Lanka	Central Bank	a) Deposit Taking Institutions: <ul style="list-style-type: none"> • Licensed Commercial Banks • Licensed Specialized Banks • Registered Finance Companies (b) Other Financial Institutions: <ul style="list-style-type: none"> • Primary Dealers • Specialized Leasing companies 	a) Regulation and supervision (Prudential supervision, corporate governance and protection of depositors) (b) Regulation and Supervision
	Securities and Exchange Commission of Sri Lanka	<ul style="list-style-type: none"> • Stock Exchange • Stock Broking/dealing Companies • Unit Trusts • Listed companies • Market intermediaries 	Licensing/registering and regulating (Supervision and protecting the interest of investors)
	Others (a) Insurance Board of Sri Lanka (b) Department of Cooperative Development	a) Insurance Companies (b) Thrift and credit cooperative societies	Regulation and supervision of insurance companies and their agents and insurance brokers; Safeguarding the interests of policy-holders. Registration of institutions

	Authority	What Institutions are being supervised?	Scope of supervisory functions(e.g. prudential supervision, corporate governance, consumer protection etc)
Chinese Taipei	Central Bank	Financial institutions	Macro-prudential supervision
	Financial Supervisory Commission (FSC)	Banks, securities, futures, and insurance firms	Prudential supervision, corporate governance, consumer protection
	Bureau of Agricultural Finance (BOAF), Council of Agriculture, Executive Yuan	Agricultural financial institutions (eg. credit departments of Farmers' and Fishermen's Associations)	Prudential supervision, corporate governance, consumer protection
Thailand	Central Bank	<ul style="list-style-type: none"> • Financial institutions : <ol style="list-style-type: none"> 1. Commercial banks, Foreign bank branches, Subsidiary, Retail banks 2. Finance companies 3. Credit Foncier companies • Foreign Bank Representatives • Assets Management Companies (AMC) • Non-bank (only credit card and other non-collateralised personal loan) 	<ul style="list-style-type: none"> • prudential supervision • corporate governance • consumer protection
	Ministry of Finance	<ul style="list-style-type: none"> • Specialized Financial Institutions (The Government Savings Bank, The Bank for Agriculture and Agricultural Cooperatives, The Government Housing Bank, The Export - Import Bank of Thailand, Small and Medium Enterprise Development Bank of Thailand, Islamic Bank of Thailand) • The Small Industry Credit Guarantee Corporation • Secondary Mortgage Corporation • Thai Asset Management Corporation, Asset Management Companies • Money Changers 	<ul style="list-style-type: none"> • prudential supervision • corporate governance • consumer protection
	Securities Commission	<ul style="list-style-type: none"> • Securities Companies • Mutual Fund Management Companies • Provident Fund 	<ul style="list-style-type: none"> • prudential supervision • corporate governance • consumer protection

	Authority	What Institutions are being supervised?	Scope of supervisory functions(e.g. prudential supervision, corporate governance, consumer protection etc)
	Others: Office of Insurance Commission	<ul style="list-style-type: none"> • Life insurance companies • Non-life insurance companies • Insurance brokers and agents 	<ul style="list-style-type: none"> • prudential supervision • corporate governance • consumer protection
Vietnam	Central Bank	The credit institutions, the branches of foreign banks, the representative offices of foreign credit institutions, and the other foreign organizations performing banking operations.	Prudential supervision The State Bank may require other State agencies to inspect or coordinate to inspect the subsidiaries, associated companies of credit institution.
	Ministry of Finance	Insurance and Security Exchange	Prudential Supervision

Source: SEACEN Survey Replies by Member Banks, October 2010

Under multiple supervisory institutions, potential conflicts and inconsistencies could arise:

1. Between the objectives of prudential and monetary policies, even when both functions are within the realm of the same organisation (i.e., central banks); and,
2. Between the objectives of different supervisory agencies.

The conflict of objectives between monetary and prudential policies is obvious in some circumstances. One example is in the area of the lender-of-last resort function and bail-out facilities. Bail-out exercises during the 1997 East Asian financial crisis (prudential policy to prevent systemic risks) resulted in sudden severe increases in the inflation rate (monetary policy) and meltdown of local currencies, particularly in Indonesia. Another possible area where conflict may occur is central banks' (monetary policy) support for small and medium enterprises. Looking from the prudential point of view, it is uncertain whether this type of support will lead to potential losses. In intermediating large capital flows, prudential measures must be in place to strengthen credit and other risk management capabilities of individual banks while monetary policy must be able to limit excessive credit expansion (Lindgren (2007)).²³

Obviously, if there are various supervisory agencies, the challenge is how to ensure close coordination among them for policy consistency. For example, in the 1980s, the US thrift industry experienced massive losses partly because the housing industry was heavily promoted by the industry's prudential supervisor, the Federal Home Loan Board. Similar experiences were evidenced in the US between the US Securities and Exchange Commission (SEC) and the Federal Reserve Bank (Wall (2009)). The (SEC), which is responsible for

²³ In this way, both sets of policies work hand-in-hand to enhance asset quality and bank soundness.

setting accounting policies to assist investors to make informed decisions, believes that reported net income in each period should fairly reflect the results of the firm's operation for that period. The Federal Reserve regulatory agencies, on the other hand, which are responsible for the prudential supervision of commercial banks, desire banks to build up loan loss reserves during good periods to cover losses that are likely to be incurred during weaker economic conditions. These two conflicting intentions could easily lead to inconsistent policies of reporting.²⁴

Concern over coordination failure led to an intensive discussion on another approach of an independent integrated financial supervisory agency immediately after 1997 crisis. However, the recent global financial crisis demonstrated that the existence of an independent integrated financial supervisory agency does not necessarily guarantee timely and improved coordination between the relevant institutions. Following the subprime crisis in 2007, Northern Rock (NR), a medium-sized bank, suffered a bank run, the first such run on a British bank in approximately 130 years. The NR episode opened up new debates on whether the Tripartite Arrangement is the right approach for achieving financial stability.²⁵ These debates were centred on not only whether the same institution should be responsible for the overall systemic financial stability as well as the power to supervise individual institutions but also whether a central bank, having no statutory power over prudential regulation and supervision of individual institutions, can effectively act as a lender-of-last-resort (LLR) (Llewellyn (2009)). In the case of NR, the FSA's view was that it had wanted the BoE to intervene earlier but that the central bank had different views regarding moral hazard problems (Llewellyn 2008). It took over a month for the BoE to finally announce its support for NR (Kashyap (2010)). However, in all fairness, lacking coordination and information sharing, the BoE was unaware of the severity of the problems until much later (Ponce (2010)). In this respect, as has longed argued by the Bank of Japan, unless it has information on financial conditions, the central bank cannot effectively act as the LLR (Llewellyn (2008)). It has also strongly argued that the Tripartite Arrangement is

²⁴ A number US banks, including Sun Trust -- a large regional bank in the US, were caught between the two regulators (Wall (2009)). The US Congress eventually had to step in and mediate the policy conflicts between these two key regulatory agencies.

²⁵ The UK supervisory structure for financial stability is the Tripartite Arrangement which consists of the Bank of England (BoE), the Financial Stability Authority (FSA) and the Treasury. To ensure the smooth running of the Tripartite, a Memorandum of Understanding (MOU) was signed in 1997 and subsequently updated in 2006 between the three parties. Following the MOUs, in terms of financial stability, it is clear that the task of the BoE is to maintain the stability of the financial system as a whole while the FSA's powers and responsibilities include the prudential supervision of financial markets and institutions. Meanwhile, the Treasury is responsible for the overall institutional structure of financial regulation and the legislation which governs it. Accountability, transparency, avoidance of duplication and ensuring regular information exchange were explicitly stated in these MoUs. In the event of a crisis unfolding, the Tripartite Arrangement implies that FSA has to decide whether an appealing bank for help is solvent, the BoE will decide whether the failure of that bank is systemic and because tax-payers' money is involved, the Treasury, acting on the advice of the BoE and the FSA, will make a decision whether to authorise support (Hall (2008)).

“risky” and an “invitation to disaster, to delay, and to wrong decisions.”²⁶ The FSA is expected to be disbanded by 2012 with the power of supervision transferred back to BoE.

In the SEACEN region, as the supervisory model is mostly partially integrated (where various agencies (central banks/monetary authorities included) are responsible for supervising the different subsectors of the financial industry), there are various ways to enhance supervisory effectiveness. In Malaysia, the new 2009 Central Bank Act (CBA) empowers Bank Negara Malaysia with a greater consolidated supervisory mandate. Provisions under this new Act range from providing the central bank with authority to institute cooperation arrangements and allowing the central bank to make explicit recommendations to other supervisory agencies with regard to financial stability. This Act also provides the central bank with power to solicit relevant information for the purpose of financial stability from both banks and non-banks, and to issue reprimand orders to any person in the interest of financial stability.

Another way of enhancing cooperation is by setting up a common forum. For instance, in the Philippines and Indonesia, the Financial Sector Forum (FSF) was formed in 2004 and 2005 respectively to push for greater coordination among supervisory agencies of financial institutions. Among the functions of the FSF (which normally include the central banks and other agencies such as the securities commission and the insurance deposit guarantee cooperation. In Indonesia, the Ministry of Finance is also a member) are to coordinate and exchange information and to harmonise the implementation of specific initiatives in the financial sector. However, FSFs are usually cooperative efforts without any legal mandate and do not form an integrated supervisory body (Espenilla (2007)).

In Korea and Chinese Taipei, where the statutory financial supervisory function is not with the central banks, there are also similar efforts to close potential inconsistency gaps through cooperation. For example, the Bank of Korea conducts regular examinations of financial institutions with the Financial Supervisory Service (FSS), an independent integrated financial supervisory institution, while in Chinese Taipei, the Financial Supervision Coordination Group (FSCG) which comprises among others, senior officers of the Central Bank, Chinese Taipei and the supervisory agency, meets every month and when necessary to coordinate and cooperate on issues of financial supervision, management and examination. Meanwhile, the Central Bank Act of Bank Indonesia, introduced as far back in 1999, calls for Bank Indonesia and the Ministry of Finance to set up an independent financial supervisory institution to fully integrate the supervision of banks, securities and insurance companies within a single institution, which is expected to be established by the end of 2010.

²⁶ Another obvious flaw in the NR fiasco is the deposit insurance structure. The first £2,000 of deposits is fully guaranteed. However, the guarantee is limited to 90% of deposits of up to the next £33,000. This low level, together with uncertainty as to when and how depositors will be able to get their money back led to a loss of confidence in the system (Keasey & Veronesi (2008)). The level of deposit guarantee was almost the lowest in industrial economies (Llewellyn (2008)).

6.2 Cross-Border Supervision

The importance of supervisory cooperation has again come to the forefront in the recent sub-prime crisis, albeit with a different inflection. This time around, the issue is on cross-border supervision --why it has not progressed to what it should be, to deal with the scope and complexity of financial development (BIS (2009)). Cross border banking with the presence of multinational banks (includes the newly emerging regional multinational banks) enhances the 'interconnectedness' factor. It is now a well known fact that globalised banks play a crucial role in the international transmission of monetary policies and economic shocks globally. At the first instance, the lack of cross border supervisory cooperation has resulted in asymmetric information on cross-border risk exposures leading to an under-appreciation by supervisors and regulators of underlying systemic risks and connections (Kodres & Narain (2009)). In addition, it is rather obvious that the existence of asymmetric information among supervisors in different jurisdictions, leads to untimely and uncoordinated responses (Nijathaworn (2010)). Furthermore, adequate cross-country supervisory cooperation and coordination are necessary to overcome loopholes such as currency substitution, or switching from domestic lending in foreign currency to direct foreign credit.

There are a number of challenges with regard to cross-border supervision. These are mainly centred on how to optimise informational exchanges and include the following:

1. Sharing and disclosure of vital information on financial institutions are often difficult as supervisors in different jurisdictions face different legal and constitutional constraints. In addition, conflicting supervisory assessments are also expected due to the vast diversity in the operational structures of banking groups in different economies (Roldán (2005)).²⁷
2. Given the sensitivity of the information that are required for sharing and dissemination (such as stress tests results and risk assessments on the cross-border institutions (Saccomanni (2009)), supervisors may need to weigh and balance the issues pertaining to national interests such as stability and efficiency of the domestic financial system. In some circumstances, when problems are beginning to surface, there may be a divergence of interest where the home or host supervisor seek to ring-fence problems at the national level and hence, impede the early detection of emerging group-wide cross border problems. Even during a crisis, in defending national interests, national supervisors may not be willing to disclose information on vulnerabilities of financial institutions they supervise (de Larosière Group (2009)). Therefore, building trust among supervisors over time in different economies is very crucial. (Holthausen &

²⁷ For instance, recent developments in the financial sector have blurred the distinction between branches and subsidiaries in banking groups. For the sake of efficiency, banks have organised their structures along business lines rather than on legal and national lines (Ingves (2007)). Also, in the electronic age, it is now possible to manage these branches and subsidiaries on an integrated basis from the home economy (Eisenbeis & Kaufman (2008)).

- Rønne (2005)). It is also vital to share “softer” information such as informal information on borrowers, etc. (Holthausen & Rønne (2005), Zeti (2005)).
3. The home and host economies issue may also arise due to the importance of the relevant financial institution. For instance, a global financial institution may be deemed systemic and significant for the host supervisor of economy A. Yet, for the home supervisor, the presence of its global financial institution in economy A is only an insignificant share of the financial institution’s global activities.²⁸ As such, one may apply *the principle of proportionality* (PP) (Trichet (2007)). The PP ensures efficiency and effectiveness as the supervisory relationship is structured in such a way that a more prominent role is given to supervisors where the targeted group entities figure prominently in the jurisdictions (e.g., in terms of the asset size). In this way, Trichet (2007) argues that potential incentive problems can be reduced.
 4. There is also the question as to what extent such information sharing arrangements and cross-border supervision should be legalised. Pan (2010)). For example, it has been postulated that the lack of an international legal regime capable of conducting prudential supervision of cross-border financial institutions is the reason for the sub-prime crisis. Ingves (2007) also calls for the creation of a common regional/international body with a clear mandate to enable supervisors to effectively monitor and supervise cross-border banking groups. In addition, it is argued that the adoption of fully harmonised rules for a consistent supervisory framework will ensure efficiency in the decision making process.(EFS (2009)). However, others such as Trichet (2007), believe supervisors in different jurisdictions would have difficulties adjusting to a common framework given the various stages of development of *supervisory techniques*. This is well illustrated by the experience of the EU where it is rather difficult to transpose homogenous principles into national regulations (Hardy & Nieto (2008)). Regardless of the legal mandate, for cross-border supervision to be effective, a strong lead is necessary for coordinating and planning supervisory activities (Deutsche Bank (2008)).²⁹
 5. Further to cross-border supervision is cross-border crisis management (e.g., the issuance of risk warnings) and resolution. Similarly, informational sharing is important to plan for orderly resolutions. A coordinated approach is needed to ensure that there is no ring-fencing in favour of national interest or to sidestep different preferences for crisis resolution outcomes (BIS (2009)) and agency problems (Eisenbeis & Kaufman (2008)).

²⁸ For instance, the share of total asset of Citibank NA, the biggest foreign bank in Indonesia is only 0.29% of the total asset of Citigroup. Given the small share of Citibank Indonesia in the overall global asset of Citibank group, Bank Indonesia has so far been having difficulty to solicit sufficient information on the overall soundness of this group from the Citigroup’s home regulator.

²⁹ Legally, it may be difficult to empower the lead supervisor with the necessary authority as often as deemed “politically unfeasible”(Véron2008)).

One potentially effective method to facilitate cross-border policy cooperation and coordination is through the college of supervisors.³⁰ The college of supervisors is defined as a “permanent, although flexible, structure for cooperation and coordination among the authorities of different jurisdictions responsible for and involved in the supervision of the different components of cross-border banking groups, specifically large group” (The Committee of European Banking Supervisors (CEBS (2009))). As a general rule, the establishment of a supervisory college should be considered for significant financial institutions in terms of size, interconnectedness with other components of the financial system and/or the roles they play in the market which may cause systemic impact on the economy’s financial system, hence affecting the region’s financial stability.

As of May 2010, a number of major central banks in Asia have been invited to participate in colleges of supervisors. Bank Negara Malaysia, for instance, is involved in the colleges of supervisors organized by the Financial Stability Agency of United Kingdom for the Standard Chartered Group, the BaFIN for the Deutsche Bank Group and the OFSI for the Bank of Nova Scotia Group. Similarly, the Monetary Authority of Singapore (MAS) and Bangko Sentral ng Pilipinas have also participated in a number of colleges of supervisors set up for major European and the US banks. In addition, under the foreign banking law of State Bank of Vietnam, one of the conditions for the foreign bank to establish its subsidiary in Vietnam is that the home-supervisor of that particular foreign bank must sign a MOU with the State Bank of Vietnam. This MOU facilitates exchanges of data and information between the two bank supervisors. However, as of late 2010, there has not been any arrangement for supervisory colleges for Asian regional multinational banks such as Malaysian and Singaporean banks discussed earlier.

A recent survey carried out by The SEACEN Centre has identified a number of regional and global banks that have strong presence in major Asian economies (Siregar & Lim (2010)). The Hong Kong Shanghai Banking Corporation (HSBC), Citibank and the Standard Chartered Bank are among the three major international banks that have wide and extensive branch networks in the Asian region (Table 9). In addition to these three international powerhouses, the region has also witnessed the emergence of its own multinational banks. In Malaysia, banks such as the Malayan Banking Berhad (Maybank), Commerce International Merchant Bankers Berhad (CIMB) and Rashid Hussain Berhad (RHB) have expanded their networks beyond Southeast Asian economies. A number of Singaporean banks, namely the Development Bank of Singapore (DBS), the United Overseas Bank (UOB), and the Overseas Chinese Bank Corporation (OCBC) have achieved similar success in their efforts to become regional banks.

³⁰ As of September 2009, there are more than 30 colleges to supervise complex institutions.

While supervisors cannot afford to exhibit country-centric focus (Eisenbeis & Kaufman (2008)), strong convergence in cross-border supervisory practices is not a prerequisite for effective cross-border supervision. However, there must be some degree of coordinated approach coupled with flexibility to enable adaptation of supervisory standards for domestic settings (G30 (2008), Nijathaworn (2010)). In other words, it is important to recognise that cross-border supervision does not need a “single compliance process, but rather greater commonality in approaches and a process for further convergence where needed” (Roldán (2005)). In addition, it is important to recognise that in order to establish a more coordinated and streamlined process, transparency of these arrangements is very important, such as for example, prior understanding of the nature of the communication (CEBS (2007)) and technical issues (e.g., the definition of liquid assets are vastly different in SEACEN economies (Tientip (2010)). Some leeway must also be given to the type of information to be exchanged (Roldán (2005)).

7. Going Forward with the New Capital Standards under Basel III

Basel III represents a new era for global capital standards, emphasising on increasing both the quality and level of banks’ capital (Caruana 2010). Recognising the pro-cyclicality nature of banking activities and close connectivity of macroeconomic and financial sector conditions, the primary objective of the new capital standard is to enhance the quality and the level of banks’ capital. On September 2010, the Group of Governors and Heads of Supervision (the Basel Committee’s governing body), announced higher global minimum capital standards for commercial banks. This follows the agreement reached in July 2010 on the overall design of capital and liquidity reform package ---referred to as Basel III.

The Tier 1 minimum capital requirement which includes common equity and other qualifying financial instruments based on stricter criteria will be increased to 6 percent, compared to a minimum ratio of 4 percent under Basel II (Table 10). Under the new standard, a higher minimum capital requirement in terms of common equity is raised from 2 percent to 4.5 percent of risk-weighted assets. Furthermore, a broader and stricter definition of risk-weighted assets is imposed, particularly with the restrictive treatment of trading book, counterparty risk and securitisations. With the new tighter treatment, common equity minimum capital increased effectively from roughly 1 percent to 4.5 percent. Hence, the new capital requirement is expected to not only increase the level of capital adequacy, but also the quality of loss-absorbing capital.

Table 9: Cross Border Banks in SEACEN Economies

Central Banks/Monetary Authorities	Top 3 domestic FIs in your jurisdiction that have significant presence in the region	Top 3 foreign FIs in your jurisdiction that are originated from SEACEN member economies	Top 3 other foreign FIs (apart from originating from SEACEN member economies) that have significant presence in your economy
Ministry of Finance, Brunei Darussalam	The domestic banks have a presence only within the economy	<ul style="list-style-type: none"> - Maybank (Malaysia) - UOB (Singapore) - RHB Bank Berhad (Malaysia) 	<ul style="list-style-type: none"> - Citibank - HSBC - Standard Chartered Bank
Bank Indonesia	<ul style="list-style-type: none"> - Bank Mandiri - Bank BRI - BCA 	<ul style="list-style-type: none"> - CIMB Niaga (Malaysia) - Bank International Indonesia (MayBank Malaysia controls around 43%) 	<ul style="list-style-type: none"> - Citibank - HSBC - Standard Chartered Bank
The Bank of Korea	<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - DBS (Singapore) - UOB (Singapore) - OCBC (Singapore) 	<ul style="list-style-type: none"> - Citibank - HSBC - Standard Chartered Bank
Bank Negara Malaysia	<ul style="list-style-type: none"> - Maybank - CIMB Group - Public Bank 	<ul style="list-style-type: none"> - OCBC (Singapore) - UOB (Singapore) - Bangkok Bank (Thailand) 	<ul style="list-style-type: none"> - Citibank - HSBC - Standard Chartered Bank
Bank of Papua New Guinea	<ul style="list-style-type: none"> - Bank South Pacific 	<ul style="list-style-type: none"> - Maybank (Malaysia) 	<ul style="list-style-type: none"> - ANZ Bank (Australia) - Westpac Bank (Australia)
Bangko Sentral ng Pilipinas	<ul style="list-style-type: none"> - Metropolitan Bank Corporation (Metrobank) - Philippine National Bank (PNB) 	<ul style="list-style-type: none"> - Chinatrust (Chinese Taipei) - Maybank (Malaysia) - Korea Exchange Bank (Korea) 	<ul style="list-style-type: none"> - Citibank - HSBC - Standard Chartered Bank
Monetary Authority of Singapore	<ul style="list-style-type: none"> - DBS Bank Limited - OCBC - UOB 	<ul style="list-style-type: none"> - Maybank (Malaysia) - Bangkok Bank (Thailand) - RHB Bank (Malaysia) 	<ul style="list-style-type: none"> - Citibank - HSBC - Standard Chartered Bank
Central Bank, Chinese Taipei	<ul style="list-style-type: none"> - Bank of Taiwan - Taiwan Cooperative Bank - Mega International Commercial Bank 	<ul style="list-style-type: none"> - DBS (Singapore) - OCBC (Singapore) - Bangkok Bank (Thailand) 	<ul style="list-style-type: none"> - Citibank - HSBC - Standard and Chartered Bank
Bank of Thailand	<ul style="list-style-type: none"> - Bangkok Bank - Kasikorn Bank - Siam Commercial Bank 	<ul style="list-style-type: none"> - UOB (Singapore) - CIMB Thai (Malaysia) - OCBC (Singapore) 	<ul style="list-style-type: none"> - GE Capital - ING - Standard Chartered

Source: Siregar and Lim (2010)

Table 10: New Capital Framework

	Common equity	Tier 1 Capital	Total Capital
Minimum	4.5%	6.0%	8.0%
Conservation buffer	2.5%		
Minimum + conservation buffer	7.0%	8.5%	10.5%
Countercyclical capital buffer	1-2.5%	0-2.5%	

Source: Danske Markets (2010)

To improve further the resilience of the banking sector, a 2.5 percent capital conservation buffer (CCB) is added on top of the 4.5 minimum capital requirement in the category of common equity, pushing the top-quality equity capital requirement to 7.0 percent compared to just 2 percent under the present Basel II standards. There is also flexibility in the CCB as it can be drawn down in times of losses, thus mitigating procyclicality in times of stress for individual banks. The CCB has a macro-prudential dimension as it can impact credit supply (Caruana (2010b)).

Another important aspect of the system-wide approach is the counter-cyclical buffer of (0-2.5 percent) of common equity or other fully loss absorbing capital, in addition to the CCB, to ensure systemically important financial institutions (SIFIs) possess loss-absorbing capacity beyond the common standards. The cyclical buffer, aimed at achieving the broader macro-prudential goal, will be based on the private sector credit as excess aggregate credit growth have often been associated with systemic risk. It is up to the national supervisors to exercise judgement on the common point of reference and determine when it is necessary to impose such a buffer.³¹ There is no cost for withdrawal in contrast to the CCB, which imposes some costs if it is drawn down (e.g. restrictions on earning distributions to stakeholders in the form of dividends, discretionary bonuses, etc for banks approaching the regulatory minimum requirements).

Lastly, a non-risk-based leverage ratio (i.e., Tier 1 capital divided by total assets, with no risk weighting) which acts as a backstop (i.e., last resort) is proposed to address the risk of build-up of excessive leverage in the system (Caruana (2010)). The backstop leverage ratio ensures that resulting distortions, if any, are within a certain range if risk based capital rules are found to be wrong. In general, the minimum total capital ratio remains at 8 percent but the additional capital conservation buffer increases this ratio to 10.5 percent of risk weighted assets of which 8.5 percent must be Tier 1 capital.

Member economies will start implementing Basel III on 1 January 2013 with the phase-in period extending in some cases to January 2019 (Table 11). For example, the phasing period for the capital conservation buffer is between 1 January 2016 and year end

³¹ However, the Basle Committee on Banking Supervision expects the national authority to invoke this requirement only infrequently.

2018, becoming fully effective on 1 January 2019. However, flexibility is given for national authorities to shorten the phasing period where appropriate.

Table 11: Phase in Arrangements of New Minimum Capital Requirements

	2013	2014	2015	2016	2017	2018	2019
Minimum Common Equity Ratio	3.5%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital Conservation Buffer				0.625%	1.25%	1.875%	2.5%
Common Equity plus Capital Conservation Buffer	3.5%	4.0%	4.5%	5.125%	5.75%	6.375%	7.0%
Minimum Tier 1 Capital	4.5%	5.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Total Capital	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Total Capital plus Conservation Buffer	8.0%	8.0%	8.0%	8.625%	9.125%	9.875%	10.5%

Source: BIS & Danske Markets (2010)

One of the many questions raised is how Basel III may impact the banking industry in the transitional period. According to the projection of the Institute of International Finance (IIF), the output of the US and Europe would increase by 3 percent in the five years upon adoption of Basel III (Elliot 2010). However, a joint study by the Assessment Group of the FSB and BCBS has analysed this particular issue in detail and found that the increase in the capital requirement does have a significant impact on bank lending and that the effects are small as long as other conditions necessary for appropriate adjustments are in place. As expected, the study also found that the impact very much depends on the gap between the new regulatory targets and the prevailing capital levels.

Most banks in Asia, including SEACEN commercial banks, have reached the minimum capital requirement level of even Basel III (The Star (2010), Table (12)). The Monetary Authority of Singapore has, in fact, enforced minimum Tier-1 CAR at 6 percent and total CAR at 10 percent. In addition to a respectably higher minimum Tier-1 CAR and total CAR, a number of Asian central banks and monetary authorities encourage banks to hold more capital than minimum requirement through some incentive measures. In Chinese Taipei, for instance, the Financial Supervisory Commission (FSC) has a policy whereby if banks want to establish foreign branches and subsidiaries or buy back their own shares from the stock market, their capital adequacy ratios are required to be well above 10 percent. A greater flexibility to expand its operation is also given to a bank by Bangko Sentral ng Pilipinas provided that the bank maintains a higher level of CAR than the prescribed minimum level of 10 percent.

A study as reported by the Asian Banker in May 2010, has demonstrated that the adjustment from Basel II to Basel III would lower the Tier 1 ratio position of major commercial banks in Asia. However, for most banks included in the study, their Tier 1 ratios continue to be well above the new minimum capital adequacy ratio. The minimal impact of Basel III on the capital of these banks are largely due to the fact that these banks

have avoided issuing and dealing with complex derivative and hybrid capitals, and have operated within simpler business models than their counterparts in the US or Europe.

**Table 12:
Basel III: Deductions and Adjustments**

Bank	Market	Equity Tier 1 Ratio	
		Basel II	Basel III
Bank of China	China	9.1%	8.0%
Bank of Communications	China	8.2%	7.8%
China Construction Bank	China	9.2%	8.9%
China Merchants Bank	China	8.3%	8.2%
ICBC	China	9.9%	9.3%
Bank of China (Hong Kong)	Hong Kong	11.6%	11.4%
Hang Seng Bank	Hong Kong	12.8%	11.2%
Bank Central Asia	Hong Kong	14.5%	14.5%
Bank Danamon	Indonesia	15.6%	15.6%
Bank Mandiri	Indonesia	10.5%	10.5%
Bank Negara Indonesia	Indonesia	9.9%	9.9%
Bank Rakyat Indonesia	Indonesia	11.9%	11.9%
Hong Leong Bank	Malaysia	15.8%	15.8%
Maybank	Malaysia	8.4%	8.2%
Public Bank	Malaysia	7.3%	6.6%
DBS	Singapore	10.9%	10.6%
OCBC	Singapore	10.7%	7.1%
UOB	Singapore	11.9%	11.1%
Bangkok Bank	Thailand	12.6%	12.5%
Kasikornbank	Thailand	10.3%	8.1%
Krung Thai Bank	Thailand	9.1%	8.2%
Siam Commercial Bank	Thailand	12.3%	11.8%

Source: The Asian Banker, Issue 97, May 2010

However, Mervyn King, Governor of the Bank of England, has suggested that the Basel III framework has not raised the capital requirement of banks sufficiently to prevent another potential crisis (King (2010)). He based his observations on three criteria. Firstly, a very much higher level of capital than the proposed is needed to counteract a change in sentiment during times of stress. Secondly, the Basel risk-weights approach is based on estimates during normal periods and in times of stress, these valuations become very poor estimates of underlying risks. Thirdly, the Basel framework is still concentrated on the asset side of a bank's balance sheet and is thus, inadequate to deal with risks arising from

liquid assets and the risky structure of liabilities.³² As the financial sector system becomes more sophisticated, as is the case in the more advanced economies, banks are relying less on deposits for their lending and investment activities. Liquidity mismatches may, thus, arise as the net stable funding ratio (NSFR) can be lower than required.³³ More explicit elaboration is arguably needed for Basel III on this liquidity issue.

In addition, Binder (2010) has argued that Basel III does not fully address the issue of over reliance on credit ratings. He asserts that rating agencies which have performed poorly on rating mortgage-backed securities and collateralised debt obligations will still have a major role to play in the risk-weighting process under Basel III. Furthermore, he also argues that the process of letting banks use their own internal model to measure risks remaining in Basel III and this has proven to be disastrous for Basel II. There will be challenges in implementing Basel III for supervisors across different jurisdictions (Slaughter & May 2010). However, it is fair to say that Basel III is attempting to address systemic issues more methodically. The integrated approach which includes resolution regimes will take into account a combination of capital surcharges, contingent capital and bail-in debt (BIS 2010).

8. Financial Stability Mandate: Inventory of Governance Challenges

There has been growing awareness and acceptance of the central bank role as a financial stability authority, in addition to monetary authority.³⁴ It is, therefore, critical to anticipate the challenges in establishing a good governance structure to meet this financial stability objective. While there is no “one size fits all” best practice governance framework appropriate for all central banks at all times, there are some acknowledged common elements. A good governance structure requires three interrelated characteristics (BIS (2009)):

- Clear and well-specified objectives;
- Appropriate powers and resources; and
- Close alignment of objectives and incentives.

On the first feature of clear and well-specified objectives, a number of issues arise from the aftermath of recent global financial crisis. While the issue of ‘financial stability’ has been widely debated, there is yet to be a consensus on a standard definition of financial stability nor is there any easy way to define it (Foot (2003)) or how best to model and analyse it (Andersen (2008)). It is arguably easier to define instability than financial

³² In the UK, the government introduced a levy on large banks from 1 January 2011. The levy is intended to encourage banks to move to less risky funding profiles (i.e., long-term debt and equity). The levy, according to the UK government is intended for banks to make “a fair contribution in respect of the potential risks they pose to the UK financial system and wider economy.” (HM Treasury 2010).

³³ $NFSR = \frac{[\text{Stable Funding (capital, deposit, etc)}]}{[\text{Assets} \times \text{haircut ratio according to liquidity of assets}]}$. This ratio should be higher than 100% (Ito (2010)).

³⁴ Presently, in most central banks of the emerging markets, including those of the SEACEN economies, the financial stability mandate remains implicitly stated in their central bank acts.

stability (Ferguson, Jr. (2003)). Having done an extensive literature review, Schinasi (2004) defines possible ranges of financial stability:

1. A financial system is entering a range of instability whenever it is threatening to impede the performance of an economy.
2. A financial system is in a range of instability when it is impeding performance and threatening to continue to do so.

Another challenge is with the measurement of financial stability. Unlike monetary policy objective in general, such as price stability, there is still no generally acceptable approach to measure how much financial stability is intended and whether the appropriate degree has been achieved (BIS (2009)). In a number of cases where the central bank has an explicit legal objective for financial stability, the objective is broad ranging (BIS (2010)). Bank of Thailand's objectives, for instance, are to carry out such tasks as pertaining to the maintenance of monetary stability, financial institution stability and payment system stability, which covers a substantial range of financial stability considerations, if not its entirety. In such circumstances, designing policy guidance/rule and establishing accountability will be easier said than done. The lack of clarity on the overall objective and measurement of financial stability is likely to have fundamental consequences. To start with, the definition and objectivities of financial stability are critical in defining the concept of a systemically important financial institution (SIFI). Unless the concept of financial stability is clear, it is going to be challenging to identify unambiguously SIFIs in the economy.

Furthermore, what kind of policy measures/instruments are appropriate for achieving financial stability? So far, there is no policy instrument that is uniquely suited to deal with the task of safeguarding financial stability. Hence, the lack of clarity in the objectivity and definition of financial stability places fundamental challenges to the second characteristics of a good governance structure, namely 'appropriate power and resources'. Human resource is another vital element that must be adequately met. Integrating the two mandates of monetary (price) stability and financial stability requires a closer look at the governance issue of human resource management of the central bank. To effectively pursue these dual objectives, it is important that our financial stability supervisors adopt both the monetary and macroeconomic perspectives. Presently, teams are looking at micro-prudential and macro-prudential surveillance work separately in most of the SEACEN central banks. Going forward, a closer coordinated and more integrated surveillance team is needed. In this light, human resource policies may have to be relooked at and the organisation restructured to meet the changing skill needs.

The availability of adequate resources and instruments is essential for the successful 'alignment of primary objectives/mandates' of the central bank, particularly the mandates of monetary stability and financial stability. The recent global financial crisis demonstrated once again that there are potential policy trade-offs in achieving the two objectives. The need for a balancing act is particular felt in recent months when some economies initiated policy measures to shift away from the crisis 'packages' implemented

during the peak of sub-prime crisis. The return of inflationary pressure and rising asset prices have urged the central bank to raise its policy rate, while at the same time being mindful of the impacts of the tightening on still fragile banks' balance sheets.

The achievement of close alignment of objectives and incentives requires not only appropriate powers be embedded in central banks but also that their role(s) be clearly defined. Even then, it is a challenge to align closely the many different objectives and roles of the central bank as the financial stability authority and liquidity manager of the financial sector. For the most part, the role of the central bank/monetary authority in managing liquidity of the banking system has largely been unchallenged. Across the world, particularly emerging markets, central banks play an important role as the lender of last resort, which has been well established and concurred. In contrast, the supervisory role of the central bank continues to be viewed differently and debated upon. The 1997 East Asian crisis sparked the urgency to detach the supervisory role from the central bank/monetary authority. As discussed, the principle argument for the separation of the supervisory role from the central bank is to enhance the effectiveness of the central bank's responsibility as the monetary authority. The recent global financial crisis, on the other hand, demonstrated the need for the central bank to play a greater part in the supervision of financial institutions. The era of great moderation (low inflation) across the globe has been found to be gravely inadequate to safeguard much-needed stability in the financial sector. Even during the period of sound macroeconomic conditions, the financial system was subject to various self-amplifying mechanisms in both upward trends, bubbles, and the downward trends, busts and phases of the credit cycle (Goodhart (2010)). To ensure its effectiveness as both liquidity manager and financial stability authority, a heightened role of the central bank as supervisor of banking and even non-banking financial institutions is arguably warranted. During normal or stable periods, the dual objectives of liquidity manager and financial stability authority may not present any concern to the monetary authority. During a crisis period, however, a central bank may have to cope with the sudden requirement for massive liquidity support beyond what it can cope with individually. As discussed earlier, closer coordination with different authorities, which is in this case, with the fiscal authority is absolutely essential.

9. Concluding Remarks

The worst stage of the sub-prime crisis may have passed, but uncertainties in the global financial market still remain. The recent IMF economic outlook forecasted a healthy recovery of the world economy with overall growth rate close to 5% in 2010, predominantly driven by the strong growths of the emerging markets in Asia. The report, however, also underlines a score of fragilities still prevailing in advanced economies such as the US and Europe. Continued weak labour and housing markets in the US are expected to continue in 2011. Concerns over the soundness of banking systems and the urgent need to consolidate fiscal positions in many European economies further diminish the prospect of a full-scale economic recovery in the next few years. Consequently, most of the export dependent Asian emerging markets, SEACEN economies included, are forecasted in an Economist poll conducted by the Economic Intelligence Unit, to experience slower growths

in 2011 compared to 2010.³⁵ Under such circumstances, this study reviews selected issues and challenges facing central banks of the emerging markets, particularly SEACEN economies.

As with the aftermaths of past economic and financial crises, new challenges are emerging as the economy and in particular, the structures of financial sector are being transformed. While the more developed economies of the western hemisphere are busy clearing out their cobweb of debts, the Asian emerging economies will continue to be the engine of growth for the global economy. Thus, strong capital inflows currently experienced by emerging markets are expected to continue for the next several years. For the emerging market central banks, including those of the SEACEN economies, dealing with the tsunami of capital flows and their impacts on the domestic economies is one of the immediate challenges. Consequently, the potential rise of price factors, namely exchange rate and asset prices, has to be managed while taking into account the remaining vulnerabilities of the balance sheets of the corporate and financial institutions, the overall investment climate and demand in the economy. Under these circumstances, a combination of moderate adjustments in the key policy rate with an assortment of prudential regulations have already being employed by the SEACEN central banks in the past few years. One of the familiar objectives of prudential regulations, in particular, has been to manage lending to the property sector, in attempts to prevent another round of speculative asset bubbles.

Maintaining only price/monetary stability, as shown during the great moderation period of the last decade, has proven to be inadequate to prevent the outbreak of the global financial meltdown of 2007-2009. There is now a greater appreciation of financial stability, beyond the monetary policy objective. The new mandate of financial stability, however, comes with multiple challenges for central bankers. For a start, unlike monetary policy stability, central bankers have not reached a collective or common definition of financial stability. There are also no universal criteria to measure financial stability. Without a clear definition and measurable targets, it remains questionable as to how central banks can move forward with the financial stability agenda. Nevertheless, in view of the increasingly close linkages between the macroeconomic environment and financial sector conditions, an appropriate portfolio of micro-prudential regulations can be adopted to achieve macro-level objectives. Therefore, a better informed central banker with appreciation for both the institutional balance sheet and systemic implication is needed to balance the dual objectives of financial and monetary policy stabilities. As the role of human resource development is critical, designing forward-looking human resource policy to meet these challenges should be an immediate priority as there is a relatively long time lag to build up the required capacity. In the meantime, in the current highly integrated financial markets, a closer coordination amongst financial supervisors domestically and across the borders is vital.

However, better coordination and tighter regulations alone are insufficient conditions to achieve financial stability. On hindsight, the 1997 financial crisis has taught us valuable lessons in that most economies in the Asian region including those of SEACEN,

³⁵ Economic and financial indicators, the Economist, December 18th of 2010.

have followed through with much-needed forward looking reforms which have transformed and strengthened our financial sectors, which in turn, has contributed to the strong economic recovery in the SEACEN region. Therefore, going forward, continuous reforms will contribute to the overall soundness of the financial system, fortifying the domestic financial sectors against potential financial crises.

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