SECTION 1

THE NATURE AND PATTERNS OF CAPITAL INFLOWS IN EMERGING ECONOMIES (EMs)

Since SEACEN's foundation, member central banks/monetary authorities have faced an environment of volatile capital flows.¹ These flows drove economic activity and exchange rates which made it difficult to achieve price stability. The flows also elevated financial stability concerns, especially during the Great Financial Crisis, the Taper Tantrum, COVID-19 pandemic period, and current high inflation and high interest rate period. Through it all, however, SEACEN central banks have managed the volatility well. Indeed, SEACEN central banks' successes in addressing capital flow challenges are now helping to forge a new international consensus on how central banks can best confront an environment of volatile capital flows.

The current rethinking of how to deal with capital flows in the conduct of monetary and financial stability policies has come at a critical time. Capital flows are inherently volatile. Indeed, recent trends point to the spectre of even more destabilising flows than in the past. Bond and equity portfolio flows remain increasingly vulnerable to the whims of growing assets under management of global investors who invest in EMs. Record global government and private debts accumulated over the past decade need to be refinanced periodically from pools of savings from around the globe. In this context of an over-extended financial system, the global central banking community appears to be on the cusp of ushering in a new period of asynchronous monetary policy, much higher interest rates, and shrinking central bank balance sheets. The extent of the asynchronicity could accelerate sharply in

¹ The SEACEN member central banks/monetary authorities include Brunei Darussalam Central Bank; National Bank of Cambodia; People's Bank of China; Reserve Bank of India; Hong Kong Monetary Authority; Bank Indonesia; Bank of Korea; Bank of the Lao PDR; Bank Negara Malaysia; 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, Chinese Taipei; Central Bank of Sri Lanka; Bank of Thailand; and State Bank of Vietnam. Throughout this publication, SEACEN member economies refer to the economies of the 19-member central banks/monetary authorities whenever data are available.

the near term as some central banks find themselves falling far behind the curve in their efforts to control inflation. And, with the ongoing monetary policy tightening in the major advanced economies, such as the Federal Reserve in the United States, powerful global monetary policy spillovers to the region will remain a significant force influencing capital flows along with the expected gyrations in financial markets.

SEACEN central banks in many respects are better prepared to address these challenges than they previously were. Access to more detailed capital flow data than in the past opens opportunities to refine central bank risk analyses of capital flows (CGFS, 2021; and SEACEN, 2020). With more detailed capital flow data across time and across countries, better methods are being built to assess capital flow developments. These could give central bankers a clearer and timelier picture of financial flow risks.

The central bankers are also benefiting from a more nuanced understanding of the forces driving the new capital flow environment. Recent advances in macro-financial research offer new insights into important domestic and international mechanisms that help to explain how "good" capital flows can turn "bad." These empirical and theoretical advances help to explain why past policy actions were ineffective at times and point to the economic and financial conditions when policies are likely to be effective.

Along with better data and an enhanced understanding of capital flow drivers, central bankers are more open to proactively respond to capital flows. In part, many central banks have been questioning the effectiveness of the narrow inflation-targeting frameworks for monetary policy. In this context, it is not surprising that active consideration is being given to broadening policy frameworks aimed at preserving macroeconomic and financial stability by more explicitly addressing capital flow volatility and using more tools like a wider array of interest rate and balance sheet tools for monetary policy, macroprudential policy measures, foreign exchange intervention as well as capital flows management measures. How far should central banks, financial regulators and supervisors go towards considering and/or adopting broader, more holistic monetary policy and financial stability frameworks? What role should capital flows play in such a framework, and what additional tools can be deployed as preventive measures when capital flow risks rise and as countercyclical measures after destabilising capital flows materialise?

At the same time, international financial institutions have been taking a more tolerant attitude toward pro-active policies to rein in capital flow threats, especially those arising from shifts in global financial conditions (BIS, 2020; and IMF, 2020). This is in stark contrast to past advice that was often very critical of such policies. The criticisms tended to suppress productive dialogue about the prerogatives that developing and small, open advanced and emerging economies have when confronting particularly challenging capital flow episodes.

All these developments highlight the case for raising the prominence of capital flows in SEACEN frameworks for preserving macroeconomic and financial stability. The rest of this part discusses these issues and their implications for the conduct of monetary and financial stability policies.

A. Changing Patterns of Capital Inflows to SEACEN Economies

Foreign capital inflows to SEACEN member economies, as a group, have more than doubled in the last decade, although the region has remained a net capital exporter. Total gross non-resident capital inflows more than doubled over the past twenty years, from average annual inflows of around US\$400 billion in 2000-2010 to over US\$900 billion in 2011-2021 (Figure 1.1). The growth in non-resident capital inflows in SEACEN economies suggests the region's attractiveness as a major foreign investment destination. But it implies a greater potential for adverse impact of capital inflows to SEACEN economies declined from 6.0% of GDP in 2000-2010 to 4.9% of GDP in 2011-2021. Likewise, resident capital flows have also grown from an annual average of US\$400 billion in 2000-2010 to a little less than US\$1.0 trillion in 2011 to 2021 (Figure 1.2). Consequently, net resident capital flows have mostly been positive in the last two decades, suggesting that SEACEN economies, as a whole, have been a net capital exporter.

With the increase in non-resident capital flows to the region, there are noticeable changes in the composition and patterns of inflows. First, non-financial corporates (NFCs), particularly multinational enterprises (MNEs) including those in SEACEN economies have significantly increased their cross-border financial investments in the past decade using various instruments. Non-financial MNEs have provided within-company credit to their parent or subsidiaries located in other jurisdictions. This transaction is reported as

foreign direct investment (FDI) debt flows in the Balance of Payments (BoP) Statistics. For SEACEN economies as a whole, FDI debt has almost tripled from an average annual value of US\$22 billion in 2000-2010 to US\$63 billion in 2011- 2021. Non-financial MNEs have also provided trade credits and/ or loans to other unrelated companies, and have made cross-border bank deposits. These financial flows are recorded as increases in cross-border currency and deposits as well as loans, which grew from an average annual value of US\$65 billion and US\$28 billion in 2000-2010 to US\$165 billion and US\$64 billion in 2011-2021, respectively. These financial transactions of nonfinancial MNEs may underestimate the real cross-border exposures of MNEs who borrowed overseas through their affiliates (ADB, 2022; and Avdjiev et al., 2014). This could give rise to financial stability concerns in the future if these flows lead to more financial operations rather than channelled to real economic activities (Avdjiev et al., 2014).



Source: SEACEN staff calculations using data from IMF's Balance of Payments Statistics accessed through CEIC (July 2022).



Second, non-financial corporates (NFCs) were the largest recipient of nonresident capital inflows to SEACEN economies (Figure 1.3). This pattern is expected given that the region attracts a large share of global FDI and the region's non-financial MNEs are increasing their cross-border financial transactions (ADB, 2022). The banking sector was the second largest recipient of non-resident capital flows, followed by other financial corporates (OFCs) or non-bank financial institutions (NBFIs), which include investment funds, insurance corporations, pension funds and other financial intermediaries and auxiliaries. OFCs reported a substantial increase in inflows over the last decade from an annual average of around US\$35 billion in 2000-2010 to around US\$50 billion in 2011-2020. This suggests that although the banking sector still plays a dominant role in cross-border financial intermediation, the role of other financial corporations has grown over the last decade. These evolving patterns of sectoral non-resident capital inflows highlight sectoral differences across drivers, cyclicality, and sensitivities to policy measures of capital inflows (Lepers and Mercado, 2021).

Third, the period of 2011 to 2021 witnessed the significant rise of nonresident bond inflows, coinciding with the increase in debt issuance in Asia and the Pacific region from US\$2.3 trillion to US\$7.2 trillion over the period (ADB, 2022). The rise in portfolio debt inflows marks the move towards market-based finance focusing on emerging market debt securities, known as the second wave of global liquidity (Shin, 2013). In addition, most of the bond inflows have gone to the government sector, implying the rising importance of the public sector as a large cross-border borrower (CGFS, 2021).



Fourth, although most capital inflows into SEACEN economies have gone to China, the same evolving patterns mostly hold for ASEAN-4 economies, which include Indonesia, Malaysia, Philippines, and Thailand. In fact, average annual capital inflows to ASEAN-4 economies tripled from around US\$25 billion in 2000-2010 to US\$74 billion in 2011-2021, with bond inflows growing from around US\$8 billion to US\$25 billion in the same period. Non-financial corporates received the largest inflows, followed by the government sector which received capital mostly through bond inflows. It is worth noting that banking sector inflows have declined since 2014, while other financial corporate inflows remain relatively small compared to the SEACEN aggregate.

Fifth, the volatility of capital inflows into SEACEN economies declined from 2000-2010 to 2011-2021. The coefficient of variation of SEACEN's aggregate capital inflows in percent of GDP fell from 0.6 to 0.4. But there are differences across investment types. Although volatilities for most types of investments have gone down, the variability of portfolio equity and trade credit and advances flows rose. For ASEAN-4 as a group (Indonesia, Malaysia, Philippines, and Thailand), the volatility of aggregate capital flows has also decreased but the volatilities of portfolio equity, currency and deposits, loans, and other accounts payable have increased.

The changing patterns of foreign capital inflows into SEACEN economies reflect the varying significance of global (push) and domestic (pull) factors during financial risk-on/risk-off episodes. Existing studies document the relevance of push and pull factors in driving capital inflows.² For pull or domestic factors, strong output growth, lower macroeconomic risks (low domestic inflation), trade and financial openness, better governance and greater financial depth are associated with larger non-resident capital flows. For push or global factors, higher global growth is significantly correlated with higher inflows to emerging economies, while higher global or US interest rate strongly covaries with lower capital inflows. In addition, higher global risk aversion leads to lower capital inflows or even capital flow reversals. Other studies have identified additional factors driving gross capital inflows. CGFS (2021) highlighted the significance of the institutional infrastructure of the global financial system through which capital flows are funnelled into recipient economies, known as "pipes", as another important determinant of capital inflows.

The composition, patterns, and volume of non-resident capital inflows into SEACEN economies suggest the degree to which the economies are financially integrated with non-regional and regional economies. The level of international financial integration of selected SEACEN member economies continued to grow from 2007, at the height of large cross-border financial flows, up to 2019, before the COVID-19 pandemic (Guðmundsson,

² See ADB, 2022; Ahmed and Zlate, 2014; Byrne and Fiess, 2016; Fratzscher, 2012; Giordani et al., 2017; Ghosh et al., 2014; Li et al., 2018; Mercado, 2018; and Mercado and Park, 2011.

2023). In addition, the increase in the magnitude of cross-border financial inflows to SEACEN economies over the past two decades also reflects the region's pursuit of capital account liberalisation, financial development, and steady economic growth.³

The changes in capital flow "pipes" have become the most important driver of capital flows patterns in the post-GFC period. The CGFS 2021 report also finds that the impact of global risk aversion, proxied by the VIX, has declined in the post-GFC period for portfolio inflows to emerging economies. In contrast, the significance of domestic cyclical factors, such as domestic GDP growth, have increased, suggesting that investors have increasingly been selective in assessing investment opportunities.

SEACEN economies have used various policy tools to address the adverse impacts of capital flows. Although capital inflows have provided benefits, they have also carried risks which posed challenges to policy makers. In particular, the changing patterns and varying significance of domestic and global factors require a deeper understanding of the dynamics and evolution of foreign capital inflows (ADB, 2022). Moreover, capital flow surges and sudden stops led to either improving or deteriorating macroeconomic and financial conditions, thereby warranting pre-emptive policy responses. The survey results of the IMF in 2016 on capital flow management provide valuable insights on the concerns of policy makers, including those from SEACEN economies (IMF, 2016). The report revealed that most emerging and developing economies expressed concerns about capital flows due to their volatility as well as volume. In terms of the impact of capital flows, policy makers were mostly concerned with their impact on exchange rate volatility as well as financial stability (IMF, 2016). In this regard, emerging and developing economies, including SEACEN economies, used an array of policy tools to address the adverse impacts of large and volatile capital flows, which include capital flow management measures, foreign exchange interventions and macroprudential measures. Over the past two decades, most of these measures were adjusted based on various objectives. CFMs on non-resident capital inflows were mostly loosened in line with the trend towards greater capital account liberalisation; while MPMs were mostly tightened, more so in the past decade, to manage systemic risks from capital flows (ADB, 2022). This corroborates with the IMF's (2016)

³ See Guðmundsson (2023) for detailed discussion on the link between cross-border financial integration and the magnitudes and volatilities of capital flows.

report, which showed that most emerging and developing economies used greater exchange rate flexibility, while others relied on foreign exchange intervention and macroprudential measures.

B. Implications of the Growing Importance of Foreign Portfolio Inflows to EMs and EM Asia Small, Open, and Financially Integrated Economies (SOFIEs)

(i) Broader trends and evolving patterns of capital inflows underscore the need to adjust policy frameworks

Capital flows to EMs including SOFIEs have become more sensitive to global financial conditions and global liquidity.⁴ The dependence of capital flows to EMs on risk-on, risk-off swings in global financial conditions have been well-established (Forbes and Warnock, 2012; and Milesi-Ferretti and Tille, 2011). This sensitivity varies across EM economies, depending on such local factors as macroeconomic policy, the depth of local financial markets relative to the scale of flows and the quality of financial regulation and oversight. Nevertheless, exceptionally low interest rates (long- as well as short-term rates) in the advanced economies, for so many years, have driven non-resident portfolio inflows to EMs with investors mostly in a riskon mode (Figure 1.4). In addition, foreign investors are more dependent on global mutual funds that tend to be more sensitive to global push factors (CGFS, 2021, and Cerutti et al., 2019). Consequently, as shown in Figures 1.1 and 1.4, portfolio flows were highly prone to surges and reversals, which are mostly driven by external factors such as global risk appetite (ADB, 2022). For these reasons, this study focuses on high-frequency portfolio flows data from SOFIEs in EMs and EM Asia to show that changes in global financial conditions and risk sentiment affect the tails of the distributions of portfolio flows in the near term. The impact is larger for downside tail risk than for the median outcome and for upside tail risk.

⁴ The term SOFIEs or small, open, and financially integrated economies emphasise the importance of cross-border financial integration as a key driver of capital flows volatility particularly for small open economies (SOEs). It should, however, be noted that not all SOEs are financially integrated as some may have relatively closed capital accounts and underdeveloped financial markets (Guðmundsson, 2023).



EM central banks and monetary authorities have been increasingly taking account of the financial stability consequences of global shifts in risk aversion and uncertainty in their policy frameworks. The impact of changes in global risk sentiment on EM capital flows is asymmetric and time-varying. Outflows of non-resident portfolio capital when global markets become more risk averse increase more sharply than the rise in inflows when global markets boom. Such tail dependence is also asymmetric, with higher outflows during distress compared to the surges during a capital flow bonanza. Figure 1.5 shows that changes in global risk sentiment can have an asymmetric impact on the left tails of the distribution of debt portfolio flows to EM Asia during episodes of global shocks (see Section 2 for more discussion). Indeed, in EMs, the negative price effects from sell-offs tend to be larger than the positive price effects from purchases, especially when global risk aversion is high.



Source: SEACEN staff calculations using data from IIF Weekly EM Portfolio Database (July 2022).

During the past decade, strong global investor demand for long-term US dollar assets and abundant US dollar liquidity were accompanied by a shift towards market-based financing intermediated by the non-bank financial sector, creating new risks which continue to evolve. The US dollar remains the dominant funding currency for non-US global financial and non-financial institutions. According to BIS data, over the past five years, a significant share of the increase in international US dollar funding has taken the form of marketable debt securities rather than bank lending. The broader shift in US dollar funding from cross-border bank loans to investment in international debt securities has been described as "the second wave of global liquidity" by Shin (2013) (Figures 1.6a, 1.6b, and 1.6c). As yields on core, safe US dollar assets fell (reflecting fiscal policy, quantitative easing, and regulation in the advanced economies), global asset managers had to seek other assets to satisfy the increasing investor demand for higher yielding dollar bonds. This gave emerging and frontier market issuers much easier access to longterm dollar financing, making them less vulnerable to refinancing pressures. Easy external finance also spilled over to domestic markets as ample global liquidity pushed funds into EM local currency (LCY) government bond markets (Lu and Yakovlev, 2018).



Notes: Percentage of foreign holdings in LCY bonds refers to debt securities held by foreign investors relative to the amount of LCY government bonds outstanding. CH = China; ID = Indonesia; KR = Korea; MY = Malaysia; PH = Philippines; TH= Thailand; and VN = Vietnam. Vietnam has missing values for more than five periods.

Source: SEACEN staff calculations using data from Asian Bonds Online (July 2022).



Notes: Domestic market values refer to the left-hand side (LHS); and international market values are those on the right-hand axis (RHS). Debt securities outstanding is calculated by residence and sector of issuer. Sample includes China; India; Indonesia; Korea; Malaysia; Philippines; and Thailand.

Source: SEACEN staff calculations using data from Bank of International Settlements (July 2022).



(ii) Structural changes in EM asset class creating new sources of financial stability risks

Structural changes have resulted in the rapid development of the EM asset class, bringing new opportunities and challenges with respect to dealing with capital flows. The importance of EM economies in global GDP and trade has grown in the last 20 years. This trend was accompanied by major financial deepening such that the ratio of total credit to the private sector to GDP in emerging economies grew much closer to that observed in advanced economies. Of great significance was the expansion of credit through corporate bond markets open to international investors, particularly denominated in the US dollar. Non-financial companies increasingly used the especially favourable conditions in international markets to borrow more than needed for new spending or for refinancing maturing bonds (Figure 1.7). Their treasury operations became more significant both in earning profits and in generating financial risk exposures not directly related to their core businesses. This reflects the growing financialisation of MNE cross-border transactions, as discussed in Section 1A. In fact, some corporate Treasuries saw profitable "carry trade" opportunities for gains (Bruno and Shin, 2015). These short-term gains posed risks when highly leveraged companies took such speculative positions, making their financial soundness more vulnerable to a range of shocks (slow growth, sudden increases in risk premia in global markets, dollar appreciation, among others). Other financial corporates or non-bank financial institutions (NBFIs) have also become increasingly important as issuers of debt securities as post-GFC banking regulations have encouraged some activities to migrate outside the banking sector.



The institutionalisation of the EM asset class by global asset managers, notably through portfolio debt funds, exacerbates the volatility of capital flows and raises financial stability concerns. The way global investors and asset managers decide on their investment decisions, hedging strategies and so on, have a major impact on the asset markets of small open economies. Since the GFC, EM portfolio flows were increasingly channelled through funds managed by asset managers. This is important because a significant share of the global investors in EMs and EM Asia SOFIEs are cyclical investors, notably asset managers using collective investment vehicles such as mutual funds. This trend has given rise to several new risks. The first is that of liquidity illusion. Bond funds allow investors to build more diversified portfolios based on illiquid individual bond issues that they may not understand. Because investors demand liquidity, open-end funds (mutual funds) offer a daily price even when the underlying assets are illiquid. Several episodes of severe dysfunction of even core bond markets including those of March 2020 and February 2021, have given new urgency to tackling this issue at the international level.⁵

A second risk is that the shorter investment horizons of some foreign investors can exacerbate the volatility of capital flows. Such investors (including hedge funds) are usually net sellers during risk-off periods. A third risk is that benchmarking practices may indiscriminately spread contagion across quite different borrowers. Many EM bond mutual funds, due to their concentration of investor holdings and the rush-to-exit risk during market stress, can exhibit mismatches between the redemption risk to the debt funds and market liquidity of the funds' underlying assets. With growing assets under management of cyclical investors, the outflows from their benchmark-driven funds in response to shocks can be more significant than before the GFC. Retail funds such as mutual funds can be more fickle and often see outflows from the funds during stress periods, resulting in portfolio managers selling these assets and putting downward pressure on EM asset prices. The flight from EM funds in March 2020 is the latest illustration. This is borne out in the Emerging Portfolio Fund Research historic data that tend to show redemptions of mutual funds during stress periods.

The behavioural pattern of particular classes of global investors affects market volatility in different ways. Both retail investors and hedge funds can aggravate market volatility in periods of stress. Figure 1.8 presents a schematic diagram of EM portfolio flows issuers and investors. Retail investors tend to seek exposure through indirect access *via* local banks or global banks active in these markets or through passive investment vehicles such as exchange traded funds (ETFs). Retail investors holding ETFs have increasingly contributed to the selling pressure during periods of stress. Sales by end-investors induce ETF managers to sell the underlying assets. During tail events, selling pressure is amplified by hedge funds and other leveraged investors. Sharp declines in the price of the underlying instrument (actual or expected) can induce hedge funds to unwind the total return swaps (TRS) that many have customarily used to gain (leveraged) exposure to these assets.

⁵ The Financial Stability Board has accessed mutual funds and non-bank financial intermediation more generally.



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We find that the tail dependence and asymmetry from sudden stops of EM portfolio flows in reaction to global financial shocks reflect various market factors:

- Benchmark-driven investors in the EM universe tend to be more sensitive to changes in global financial conditions.
- Both investors and issuers seek greater leverage when it is cheap.
- The complexity and sophistication of portfolio exposures of investors built up during normal times leads to an under-pricing of risk.
- The exchange rate can amplify external financial shocks: investors and issuers have unhedged FX exposures and risk-off sentiment in financial markets tends to curtail US dollar funding.

The herd behaviour of benchmark-driven investors is more intense during capital outflows than in periods of inflows. Inclusion in a benchmark index brings larger non-resident capital inflows and gives access to more diversified external financing. But indices also serve as a source of risk to financial stability. For instance, benchmark-driven flows are a growing share of overall portfolio flows to EMs. Market estimates indicate that about 70% of country allocations by investment funds are driven by benchmark indices. Total assets benchmarked to the JP Morgan EM suite of indices are approaching US\$1 trillion, while those benchmarked to EM Local Currency Bonds have reached more than US\$250 billion. Benchmark-driven foreign investors tend to be more sensitive to changes in global financial conditions than other investors (IMF, 2019). Consequently, inclusion in EM benchmark indices may reinforce the volatility of capital flows.⁶ Adverse shocks in foreign exchange markets can drive foreign institutional investors through their risk limits, both on duration and FX amount. Where FX hedging markets are thin, they can protect themselves only by selling local currency bonds. During shocks, the recipient country gets hit both in its FX market and in its bond market. Managers of funds with the bonds of many countries in the same region all get hit - the common creditor effect. Large-scale sales by funds could

⁶ China's inclusion in JP Morgan GBI-EM Global Bond Index in February 2020 coincided with a noticeable increase in the coefficient of variation of monthly portfolio debt inflows from the pre-inclusion (January 2019 – January 2020) to post-inclusion (January 2021 – January 2022) period. The same observation is, likewise, noted for other emerging economies, like Romania, which was included in 2014. See Arslanalp et al. (2020) for further discussion.

depress the entire market, perpetuate sharp currency depreciation, and trigger adverse feedback loops with broader macro-financial consequences. EM assets, thus, seem to offer limited diversification benefits during such episodes of systemic stress from global shocks. In summary, the use of common benchmarks by many EM funds and correlation between their benchmarks can lead asset managers to adopt similar allocation strategies. These funds are likely to move in a herd-like fashion as they react in similar ways when they face EM-related shocks.

The growth in index-based investing and the rise of ETFs has helped democratise access for retail investors, but at the price of accentuating market volatility. Assets under management in exchange traded funds (ETFs) have been rising steadily as investors have been attracted by their low cost, the diversification benefits they offer and the perception that they are relatively liquid. The share of passively managed funds (such as ETFs), popular with retail investors, has even been growing faster relative to actively managed funds. Such funds have become a major vehicle for non-resident investment in EM local currency government bonds. Amplifications can arise as more money from retail investors crowds into ETFs with a limited universe of liquid EM assets. Notably, mutual funds and ETFs investing in EM assets tend to have less diverse benchmarks than those investing in advanced economy assets, in part because there are fewer benchmark indices available. While EM fixed-income ETFs can be invested in assets where the underlying bonds can quickly become illiquid, the offer of daily redemption on demand according to the net asset value may falsely reassure investors, creating a dangerous illusion of liquidity.

Institutional investors, as an increasingly important channel for international capital flows, have amplified the transmission of global risk shocks to EMs. Among the range of institutional investors, active investors typically do not track any benchmarks per se, but their mandate is to maximise absolute returns. In this investor class, an important area of cross-border capital flows to EMs has been the growth of Multi-Sector Bond Funds (MSBF) since the GFC, which have built up large positions in certain EM economies. These are considered to be cross-over investors who opportunistically invest in emerging markets. MSBFs are mostly open-ended funds where investors tend to display more opportunistic behaviour relative to cyclical investors, often reducing their exposures more aggressively within very short time spans. The main risk transmission channels from MSBFs are twofold. First, they are highly concentrated - both in their positions and in their decision-making, posing risks to financial stability (Cortes and Sanfilippo, 2020; and IMF, 2021). Second, the underlying instruments often use embedded leverage through derivative structures that can amplify the risk during macro-financial shocks, in particular during tail events of inflows and outflows such as the COVID-19 crisis. As a result, these funds tend to be associated with a high degree of co-movement with global financial conditions especially during crises. Redemptions (inflows) by end-investors in which fund flows originate and investment fund managers' sales (purchases) tend to amplify each other, generating large reallocations and increased volatility of EM capital flows. As a result, investment fund behaviour tends to be procyclical especially during crises (Cortes and Sanfilippo, 2020; and IMF, 2021). The data on MSBFs indicates that there were large redemptions to raise a large proportion of cash in a few specific local currency bond markets during the COVID-19 shock (Figures 1.9a and 1.9b). This may have contributed to exacerbating the relative underperformance of these local currency bond markets to broader emerging market indices. Indeed, relative bond funds have themselves become systemic given their phenomenal growth in recent years.



Notes: The sample comprises 40 large MSBFs, domiciled in the United States and Europe from the fourth quarter of 2009 to the second quarter of 2020. MSBF = multi-sector bond fund; RHS = right-hand scale; USD = US dollar. Different shades indicate different funds. *Source:* Cortes and Sanfilippo (2021) using data from Bloomberg Finances L.P. (accessed in June 2022).



Leverage, a key amplifier of financial shocks, has risen since the GFC for EM issuers as well as global investors in EM assets. Easy financial conditions in the aftermath of the GFC in 2008-09 and the strong demand of global investors for assets in dynamic EM economies have supported a substantial rise in leverage. The greater participation of active investors such as hedge funds, with the mandate to maximise absolute returns, mainly rely on leverage as they seek access to EM markets indirectly and through unfunded investment vehicles (where the investor uses margin) including derivatives. Most hedge funds use Prime Brokerages from banks to seek leverage and typically invest through instruments like total return swaps. Hedge funds also use offshore derivatives such as the non-deliverable forward (NDF) market to gain exposure to EM markets. While such offshore derivatives may not directly contribute to capital flows, they are often a source of pressure during global shocks and tend to be transmitted to onshore FX markets and into broader domestic financial markets. Investments in EM bond funds and ETFs can also be leveraged, which can compound downward spirals during distress as leveraged investors need to meet margin calls as the value of the underlying asset and the value of pledged collateral can decline in falling markets. Lack of access to bank credit lines during a crisis can trigger destabilising fire sales of assets. In addition, low rates on US dollar bonds have stimulated non-US companies to issue dollar bonds on an unprecedented scale, resulting in the simultaneous increase of both corporate currency mismatches and corporate leverage (Chui et al., 2016). Even before the COVID-19 crisis, leverage in the nonfinancial private sector — comprising households and nonfinancial firms — had been increasing steadily in many countries. EM and EM Asia SOFIEs have also accumulated significant sovereign debt, mostly in local currency issuance.

Global investors have increasingly used more complex and opaque products to access emerging and frontier market assets, often leading to the under-pricing of risk. Various regulatory restrictions onshore (custody account requirements, settlement in local currency, and others) and the greater ease of adding derivative overlays in offshore markets condition how foreign investors seek exposure to EM assets. Investors in EM assets often seek indirect exposure through structured notes, over-the-counter (OTC) derivatives, and total return swaps and the like, which may reduce transparency. This raises prudential concerns, especially if it leads to an under-pricing of risk which suddenly becomes apparent during stress and magnifies the volatility of capital flows. Exposures in such instruments has grown rapidly. For instance, real money investors can have investments in socalled absolute return funds, which try to generate steady returns through the ups and downs in the market, and their more complex investment strategies can amplify market swings. As such, an absolute return fund can invest in an EM local currency bond while also taking a view on the exchange rate, and creating complex interactions during tail events.

Active fund strategies in LCY bond markets have increasingly invested in EM credit (mainly local currency bonds) where they separate the FX exposure from the duration (interest rate) exposure. For instance, say a benchmark investor invests in Indonesian rupiah (IDR) LCY bonds, which is part of GBI-EM-Diversified with a 9% weight, and decides to reduce its exposure to interest rate risk. But given the outlook for rising policy rate and taking a neutral view of the FX, the investor may decide to reduce the duration by lowering allocation to, say, a 6% weight on the LCY government bond, but increase exposure by allocation through a long position in FX, which could be through NDF markets or domestic forward markets. Such exchange rate overlays can result in the amplification through the exchange rate channel while the interest rate outlook can lead to lower inflows in the bond market. These strategies and investments through the derivatives markets make it difficult for EM policymakers to gauge the degree of leverage in domestic markets and the pressures from offshore markets. While country authorities can, in principle, track direct foreign ownership of government bonds, they often do not know the proportion held by the domestic financial sector on behalf of foreign investors through derivative structures. Also, the leverage that underlies such complex structures of access instruments can be an important driver of market volatility.

The complexity of the risk exposures through indirect access instruments can increase tail dependence of capital flows to global shocks. The use of total return swaps by hedge funds can amplify the impact of shocks on prices and yields. Banks (prime brokerages), the primary source of leverage for hedge funds, are also impacted. Even cyclical investors often use more complex investment strategies, combining many different instruments (from cash bonds to derivatives) to maximise returns given their expectations of interest rate and FX developments. During periods of heightened global risk aversion, such exposures can transmit market volatility across markets, including the bond market, the interest rate market, and the FX swap market. Fund managers may seek to preserve their own liquidity by selling assets ahead of expected investor redemptions (Aramonte et al., 2021). This has been evident in bond funds investing in EM government bonds. In addition, leveraged foreign investors relying on US dollar funding are hit by US dollar shortages.

However, there has been a trend towards the deepening of the financial system in EMs during the past twenty years. Twenty years ago, business, and residential investments in many EMs were held back by underdeveloped domestic financial systems. Companies and governments were too dependent on short-term dollar borrowing from foreign banks. Better macroeconomic policies and financial reforms have transformed this situation. Total credit to the private sector as a share of GDP is now very close to that prevailing in the advanced economies (Figure 1.10). Part of the increase in corporate leverage can be attributed to desirable financial deepening. Domestic financial markets have also grown relative to GDP. The development of deep local currency government bond markets, with extensive long-dated issuance, has reduced currency mismatches and eased refinancing risks. The domestic investor base, including domestic banks and institutional investors, is broader and deeper (Gagnon and Turner, 2019). As will be discussed further in the policy section (Section 3), this gives central banks greater scope to use their balance sheets to forestall unwarranted tightening of domestic financial conditions when global market sentiment takes a marked risk-off turn.



(iii) The dominant role of the US dollar as a funding currency for investors and issuers is a source of risk transmission with macro-financial stability implications.

The US dollar tends to rise when global markets go into risk-off mode and has, therefore, often been a barometer of global risk sentiment. Increased unhedged dollar borrowing over the past decade or so means that a stronger dollar implies new risks for EM economies and capital flows to them. Flexible exchange rate regimes normally mitigate the domestic impact of adverse external shocks. Currency depreciation supports domestic output when export earnings fall. This standard effect, however, can be offset (or even reversed) if unhedged foreign exchange exposures on EM balance sheets become large – which has been the case for several EMs during the past decade. Our study shows that in such circumstances, net non-resident debt flows to EMs can be subject to a higher tail risk when the US dollar rises strongly against the domestic EM currency (Figures 1.11a and 1.11b). This empirical evidence of the exchange rate as an amplifier also holds for net non-resident debt and equity flows to EMs, especially with anecdotal evidence showing limited hedging being a prevailing practice in LCY bond investments

by non-residents. In addition, increased foreign investment in local currency bond markets is another source of capital flight when markets become more pessimistic. A stronger US dollar due to a flight to safety from rising investor risk aversion tends to be followed by a weakening of portfolio capital inflows. A deterioration in global financial conditions can reduce capital flows to economies with heavy US dollar debts and/or those where the foreign ownership of domestic debt is high. US dollar strength/EM domestic currency



Source: SEACEN staff calculations using data from IIF Weekly EM Portfolio Database (accessed July 2022).

weakness also leads to a contraction of domestic credit for EMs, especially where local banks borrow dollars to lend at home. A decline in the net worth of US dollar-indebted corporates and the reduced supply of credit can lower business investment, exports, and GDP growth (CGFS, 2020).

The US dollar dominates as a funding currency for investors in local currency assets and as the issuance currency of EM companies. US dollar shortages during periods of financial stress have wide implications for FX liquidity. FX swap markets for EM currencies have grown enormously since the mid-2000s. Yet liquidity in such markets can deteriorate in periods of stress, and those who are short dollars can find the price of hedging turning against them (Kalemli-Özcan, 2019). Such tightening of US dollar liquidity can be seen through the widening of the dollar-EM domestic currency basis spread, contributing to the increased volatility of such exposures. Figure 1.12 shows the cross-currency basis spread which measures tightness in the US dollar funding market, i.e., the direct cost of US dollar funding vs. the synthetic cost of USD funding in the interbank (LIBOR-OIS spread) and derivative markets (such as the FX swap market) became more negative (Barajas et al., 2020).



Challenges and Options in Managing Capital Flows

Funding risks from mismatches can amplify the foreign exchange risks through the financial channel. Understanding the transmission mechanism is important for policymakers. Active investors including retail investors that invest in dedicated EM bond funds and ETFs are primarily investing over a shorter-term, typically take a view on the foreign exchange rate and do not hedge FX risk as they seek a higher return. Other cyclical investors (trading desks of banks and hedge funds) also tend to not hedge FX risk. Such dynamics are reflected in the rise in transactions in the FX swap market for EM currencies as demand for US dollars come from asset managers/hedge funds investing in local currency bonds, say for carry trade investors. Some of these asset managers also hedge their FX risk in the swap market. During a period of stress, which is typically correlated with a stronger US dollar from a flight to safety, there is a rush to hedge their exposures and/or to roll over the existing hedges - putting upward pressure on hedging costs. Investors often resort to selling their LCY holdings, putting pressure on the exchange rate. Such dynamics are further amplified by banks and non-banks in EMs that have borrowed in US dollars. On the other hand, institutional investors (including pension funds, insurance companies, and sovereign wealth funds) who take a longer-term view and are more inclined to hedging, can provide some support to such market volatility.

Market imperfections in EMs tend to make unhedged carry trades attractive during periods of low global rates and low volatility in FX markets. Under the "forward premium puzzle", uncovered interest rate parity (UIP) and covered interest rate parity fail to hold in the shortrun, implying that investors can earn higher returns from unhedged FX exposures.⁷ However, a sudden reversal of expectations can reverse such carry trades, perhaps disrupting local financial markets and damaging local banks (Forni and Turner, 2021). As a result, the post-GFC period of low volatility and low funding costs in the US dollar resulted in a significant build-up of carry trades leading to higher vulnerabilities in EMs. The current shift in Federal Reserve interest rates combined with higher volatility is leading to significant capital outflows from EMs.

⁷ The forward premium puzzle or the failure of UIP to hold, has been frequently documented, and this reality means currencies with low (high) interest rates tend to appreciate (depreciate) less than implied by UIP, and could be a reason to hedge a smaller share (larger share) of foreign investments (Goldman Sachs, 2018).

C. Capital Flows and their Impact on EM Financial Markets since the Global Financial Crisis

Larger currency exposures to EM LCY assets have led to greater dependence on foreign exchange markets including derivatives markets. FX flows as measured by cross-border equity and fixed income fund flows to EM Asia have been rising. Growth in EM FX derivatives markets such as FX swaps and forwards (including non-deliverable forwards (NDFs) and domestic nondeliverable forwards (DNDFs)) is notable. Trading in FX swaps continued to gain in market share in 2022 (Figure 1.13a). Turnover in FX swaps, the most heavily traded instrument, which is primarily used by market participants for the management of funding liquidity and hedging of currency risk, rose by almost a fifth between 2019 and 2022 to US\$3.8 trillion per day and accounted for half of global FX trading. In terms of currency, the US dollar continued to dominate FX swap transactions in 2022, followed by the euro (Figure 1.13b). The bulk of turnover in FX swaps was in short-maturity instruments (overnight up to seven days) in April 2019, although trading in longer tenors expanded between 2016 and 2019 (BIS, 2019).

There has been a significant increase in trading of EM currencies, but the ability of FX markets to absorb global shocks remains somewhat limited as proven during the onset of the COVID-19 pandemic. The size and turnover of capital flows can often be significant compared to the size of domestic financial markets in EM and EM SOFIEs. The global share of EM currencies rose by about 4 percentage points to 25% of total FX turnover in April 2019, continuing the trend observed in previous surveys (BIS, 2019). Several other Asia-Pacific currencies gained market share. There has been a noticeable deepening of domestic financial markets (sovereign credit markets, interest rate/FX markets, and swap markets), particularly from more active foreign and domestic investor base. The onset of COVID-19 in early 2020 raised the question whether such trend improvements in EM markets have provided shock absorbing capacity, especially when global asset managers react to such shocks.



Notes: Net-net basis refers to the values that are adjusted for local and cross-border inter dealer double-counting. Values are daily averages in April 2019 and computed as percentage of total. Refer to BIS Triennial Survey for definitions.

Source: SEACEN staff calculations using data from BIS Triennial Central Bank Survey 2019 and 2022 (accessed in October 2022).



dealer double-counting. OTH Asia includes Chinese yuan, Hong Kong dollar, Korean won, Chinese Taipei dollar, Indian rupee, and Singapore dollar.

Source: SEACEN staff calculations using data from Triennial Central Bank Survey 2019 (accessed in October 2022).

Another important trend has been the growth of offshore derivatives markets such as NDFs, which can become a source of risk transmission in domestic markets. Non-deliverable forward currency markets provide access for those seeking exposure to EM assets, both for hedging and for speculating. Asian NDF markets are among the largest globally, with the Korean won and the Indian rupee the most traded NDF currencies (Schmittmann and Teng, 2020). Asian NDF volumes often exceed onshore trading volumes. This market has grown significantly in turnover, particularly for the Indian rupee, Indonesian rupiah, and Korean won. Spillovers from the offshore to the onshore market from arbitrage between onshore forward and NDF market (forward exchange gap) can widen significantly during periods of stress, providing information content as a leading indicator of pressures building on the currency. Cross-border investors typically rely on offshore hedging and funding markets.⁸

The development of the domestic institutional investors base and domestic hedging markets have been an important risk mitigant. The rise of the domestic institutional investor base has helped to deepen financial markets. The demand for securities has come from institutional investors including long-term investors like pension funds, insurance companies, and sovereign wealth funds. Nevertheless, there is no clear empirical nor anecdotal evidence suggesting that the domestic institutional investor backstop has been able to fully counter the sell-offs under financial stress as seen during the COVID-19 capital outflow episode.

⁸ In India, several initiatives were undertaken to reduce NDF market impact on domestic market. They include, among others: (i) the onshore foreign exchange market is allowed to function round-the-clock; (ii) banks which operate International Financial Services Centre Banking Units (IBUs) are allowed to participate in the NDF market; (iii) revisions in interest rate derivative guidelines to enable easier access to non-residents; and, (iv) introduction of the Voluntary Retention Route (VRR) to attract portfolio investors with longer investment horizons and Fully Accessible Route (FAR) which allow non-residents to increase their exposure to the sovereign debt securities, have increased local currency exposures and hedging needs.

Box 1: Market Perspective on Investing in EM Asset Class ^{1/} (The SEACEN Centre)

- The broad guidelines and asset allocation decisions are undertaken by the Investment Committee. Changes to the investment mandates are generally based on differentiation between countries, regions, and asset classes.
- Investors typically invest in EM markets by (i) seeking credit exposure to the government or corporate bond market; and (ii) seeking exposure through the interest rate market and FX markets, both onshore and offshore.
- Asset managers seek exposure to the local currency bond markets to not only earn the carry difference in interest rates but also to potentially gain from the domestic FX appreciation.
- With imperfect markets, hedging costs can often offset the potential gains from the carry while the prospect of domestic FX appreciation enhances expected returns. As a result, asset managers typically do not hedge, unless they are mandated to.
- In addition, hedging the tail risk through the options market is difficult because of the lack of depth and liquidity in such markets. Rapid exits from EMs during tail events such as the drying up of global liquidity can magnify the outflows.
- Pull factors driving investments in EM asset class include; macro stability and fundamentals, availability of buffers and tools including macroprudential policies, growth potential, quality, and credibility of institutions.
- Push factors such as the low interest rate environment and quantitative easing in advanced economies has driven a lot of money to EMs.
- Market liquidity (the ability to get out of a position) is paramount in making investment decisions.
- Market participants reported that the Volcker Rule had impacted market making as financial institutions have not been allowed to hold much inventory post-GFC.

- The presence of both domestic markets for hedging and a domestic institutional investor base are important considerations.
- Investors regard economies that have a deep local institutional investor base as better able to manage capital flows, as they provide the backstop and represent the most obvious other side of the trade when foreigner investors leave the market.
- While the local institutional backstop could be helpful, it is not clear how it would behave under stress.
- In the case where an economy has a small weighting in a price index, has low yields and has bad economic fundamentals, they become the easiest ones to fall under the sell category during stressful times.

^{/1} Based on meetings with global investors/asset managers in Singapore (March 2020) and other ongoing discussions with market participants.