Exchange rate puzzles and dilemmas: how can policymakers respond?

Remarks on the Policy Panel

Diwa C Guinigundo[1]

1. Introduction: exchange rate puzzles

Since Meese and Rogoff (1983) introduced what is known as the exchange rate disconnect puzzle, which underscores the weak connection between exchange rate and virtually all macroeconomic aggregates, significant research has been devoted to the subject to improve both academics' and policymakers' understanding of exchange rates.

Notwithstanding such progress, the current rapidly evolving global economic landscape, driven in part by greater globalisation and integration, continues to challenge our conventional wisdom on exchange rates. It also continues to complicate the conduct of monetary and exchange rate management, particularly in emerging market economies (EMEs). First, EMEs have been recipients of large and volatile capital flows. While capital flows, on a net basis, have recently declined relative to their pre-global financial crisis (GFC) levels, flows have generally been increasing in gross terms. Second, the increase in international capital flows has been accompanied by a corollary increase in the volatility of financial markets, including the foreign exchange markets. Third, greater financial integration and globalisation have led to a greater incidence of financial spillovers.[2]

This paper discusses the policy implications of these challenges and the Bangko Sentral ng Pilipinas's (BSP's) experience and policy responses to cope with these challenges. In particular, the paper assesses the appropriateness of the BSP's exchange rate policy regime against these emerging global trends.

2. Emerging trends: the three inevitables of globalisation

Financial integration has taken quantum leaps amidst technological advances and massive market deregulation efforts across various jurisdictions. In the past three decades, EMEs have also become increasingly integrated in the global financial system. While this offers many benefits, this has also become associated with risks that could undermine the impact of their benefits and the effectiveness of the policy tools. In particular, greater financial integration has led to what can be considered as "three inevitables".

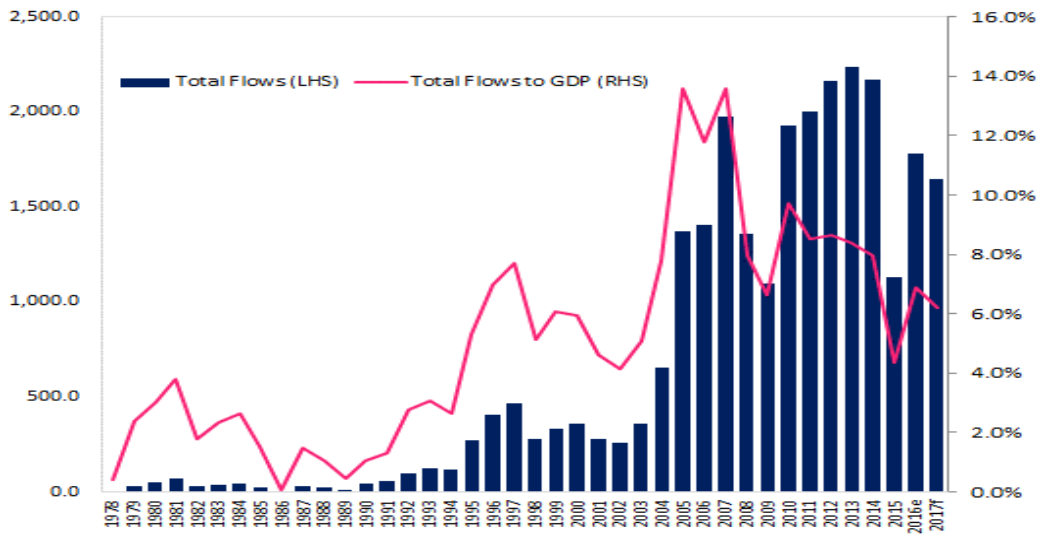
First, EMEs have been recipients of large and volatile capital flows. While capital flows, on a net basis, have recently declined relative to their pre-GFC levels, flows have generally been increasing in gross terms (Graph 1).

[1] Deputy Governor, Bangko Sentral ng Pilipinas.

[2] The IMF defines spillovers as the impact of changes in domestic asset price movements (or their volatility) on asset prices in other economies (IMF (2016)).

Total flows to EMEs

(in US$ billion, as percent of GDP) Graph 1

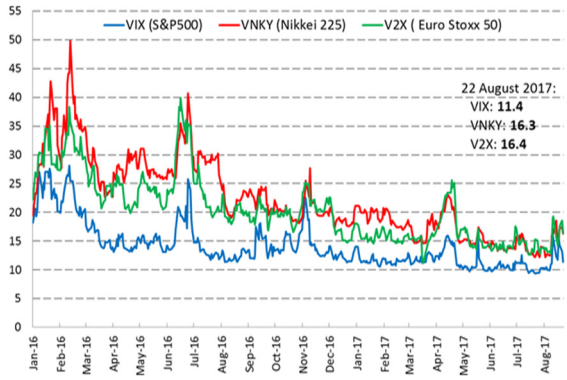


Note: Total flows is the absolute sum of private inflows and outflows to EMEs.

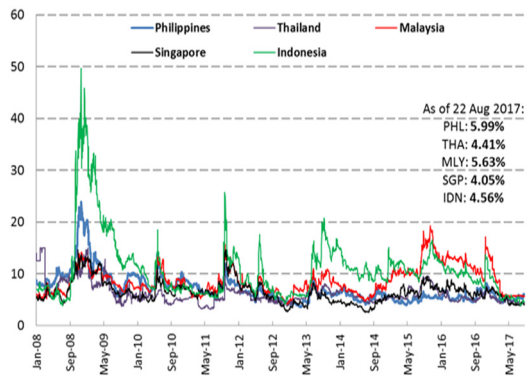
Source: Institute of International Finance (IIF).

Second, the increase in international capital flows has been accompanied by a corollary increase in volatility of financial markets. Financial markets have seen increased sensitivity to shocks. For instance, *the Chicago Board Options Exchange* Volatility Index (CBOE) or VIX, also known as the "fear index", jumped by 8.5 percentage points in a single day on 24 June 2016 in reaction to Brexit.

Implied volatility of equity indices (in percent) Graph 2



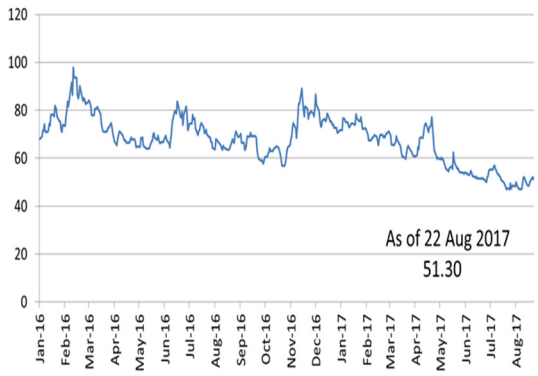
JP Morgan 1-month currency options volatility index (in percent) Graph 3



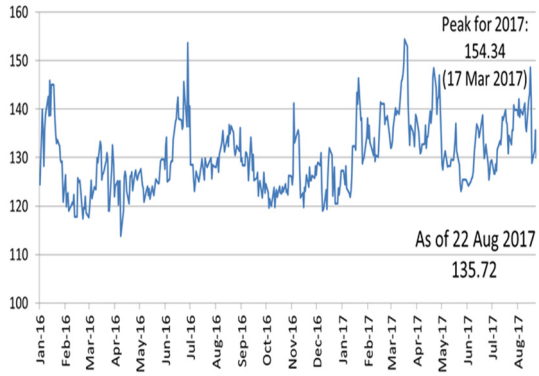
Note: VIX is a measure of market expectations of the near-term volatility by in terms of S&P 500 stock index option prices while VNKY or the Nikkei Stock Average Volatility Index indicates the expected degree of fluctuation of the Nikkei stock average in the future. V2X is based on Euro STOXX 50 Index Options traded in Eurex. The JP Morgan 1-Month Currency Options volatility index is a measure of market expected future volatility of a currency exchange rate.

Source: Bloomberg.

MOVE index
(in index points) Graph 4



Skew index
(in index points) Graph 5



Note: The Merrill Lynch Option Volatility Estimate (MOVE) Index is a yield curve-weighted index of the normalised implied volatility on a one-month treasury option. The SKEW Index is a global measure of the slope of implied volatility curve that increases as the curve tends to go steeper.

Source: Bloomberg.

As of 22 August 2017, equity markets have been relatively calm, with VIX easing to 11.4%, slightly above its historical low of 10.3% (Graph 2). Meanwhile, the FX and the bond markets have also been relatively calm, as the pricing of the one-month currency options volatility and the Merrill Lynch Option Volatility Estimate (MOVE) index[3] have both been generally on a downtrend (Graphs 3 and 4).

However, despite the observed calmness in the market, investors have been paying up to hedge against large stock price movements as shown in the general uptrend in the SKEW Index[4] (Graph 5).This could suggest that high probabilities of extreme market volatility remain a primary concern among investors.

Third, in today's highly integrated world, a problem in one jurisdiction can quickly be a problem in another jurisdiction. According to IMF (2016), spillovers have substantially risen in advanced economies (AEs) and EMEs. In fact, a third of the variation in the equities and foreign exchange markets in these economies could have been due to spillovers from shocks to EMEs.

In the BSP, spillovers in financial markets are obtained using the variance decomposition framework obtained from a generalised vector autoregressive (generalised VAR) model as suggested by Diebold and Yilmaz (2009, 2012, 2014). Under this framework, spillovers in 21 EMEs and AEs' foreign exchange and equities markets are estimated (Allon, Delloro and Fernandez (2017)).

Graph 6 shows the connectedness index for the period 3 May 2014 to 3 May 2017. The dotted line represents the average spillover for the entire sample period.

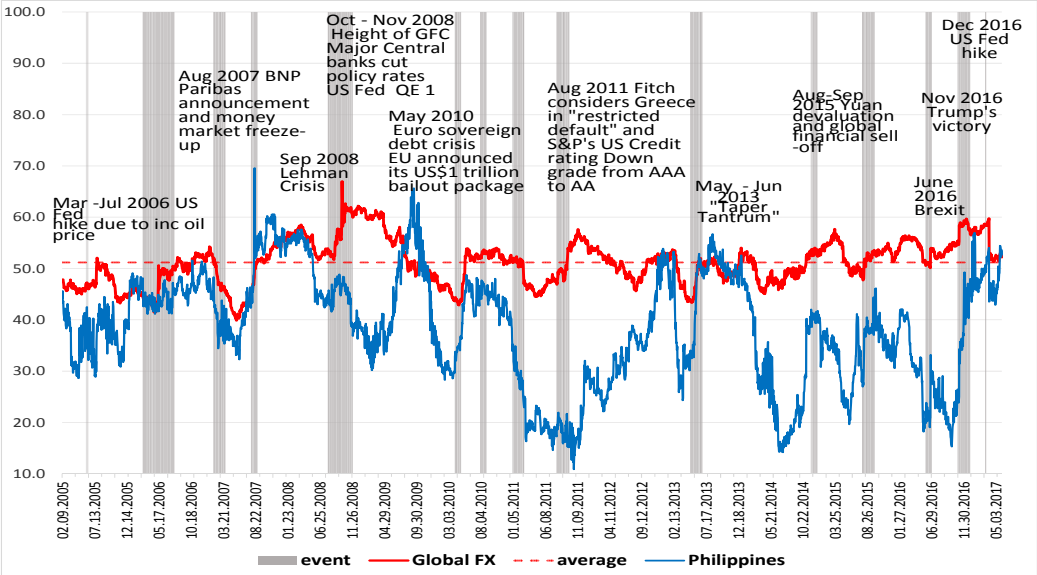
[3] The MOVE Index is a yield curve-weighted index of the normalised implied volatility on a one-month treasury option.

[4] The SKEW Index is a global measure of the slope of implied volatility curve that increases as the curve tends to steepen.

While the blue and red lines represent the evolution of spillovers on a 200-day rolling sample for the peso and the Global FX Indices, respectively.

Global FX and Peso Connectedness Indices
200-day Rolling Window (in percent)

Graph 6



Note: The indices are derived using a variance decomposition approach obtained from a Generalised VAR model. The estimation follows the Diebold-Yilmaz (2009, 2012, 2014) model which measures spillovers based on variance decompositions that are obtained from VAR models: movements in the dependent variable that are due to their own shocks; and movements in the dependent variable that are due to shocks to other variables in the system.

Source: BSP DER.

On average, the dotted line indicates that 50% of the total variation in the global FX market is due to spillovers. Moreover, the 200-day rolling indices exhibit contemporaneous spikes during periods of significant monetary policy actions and interventions in some major jurisdictions, as well as some unexpected economic and financial shocks. This suggests that spillovers in FX markets increase during periods of economic and financial stress in a particular jurisdiction.

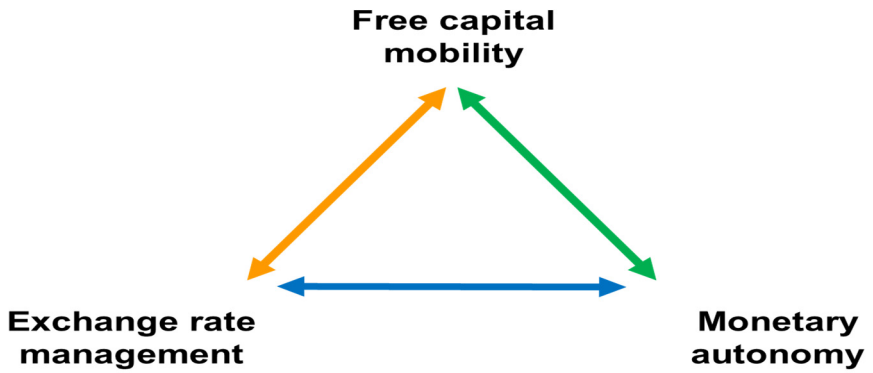
3. New puzzles: trilemma or dilemma

The foregoing emerging trends have indeed challenged and complicated the BSP's conduct of monetary and foreign exchange rate policies. The conventional wisdom has been that countries face a "trilemma", ie they must choose from (at most two out of) the following: free capital flows, a fixed exchange rate and an autonomous monetary policy (Figure 1).

However, economists and policymakers have argued that globalisation has rendered the trilemma obsolete and that governments instead face a dilemma, or an "irreconcilable duo" (Rey (2013)). Small open economies have no monetary autonomy, regardless of the exchange rate policy, due to the effect of substantial capital flows. In many cases, flows have been driven primarily by a global financial cycle that is not aligned with country-specific macroeconomic conditions.

For a small open economy such as the Philippines, which aims to expand economic development through increased financial openness, the main puzzle is how one can pursue this economic growth objective while maintaining monetary independence. This policy dilemma makes the role of the central bank as the monetary authority even more crucial.

Figure 1

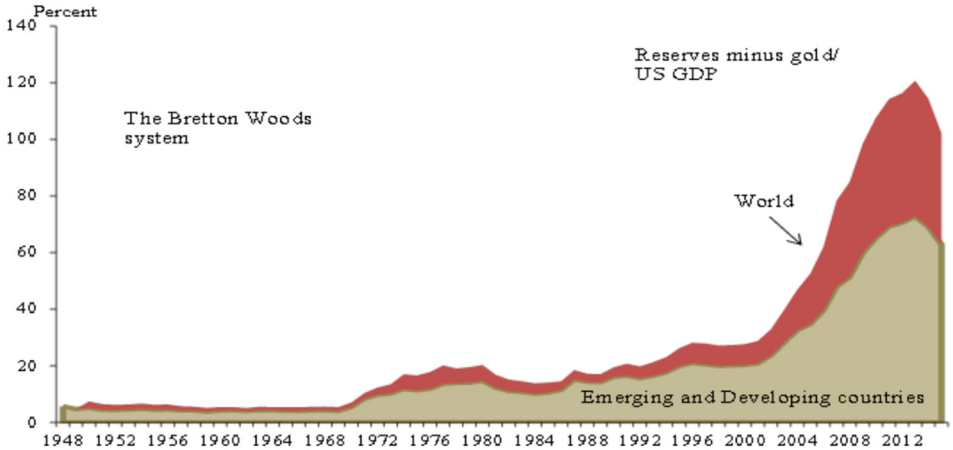


Source: Economist (2016).

Triffin dilemma. There is also the issue of what is referred to as the modern-day Triffin dilemma. The Triffin dilemma postulates that a country that issues the global reserve currency cannot maintain its value while providing adequate global liquidity at the same time. This is because increasing the amount of global liquidity makes it imperative for the global reserve-issuing country to run deficits. Hence, the value of the reserve currency declines. The ability of a currency to serve as a global reserve asset tends to be compromised if confidence in it as a global store of value is undermined.

EMEs that are exposed to capital flow volatility have resorted to the purchase of dollars to build up their reserves. Starting in 2003, we witnessed a surge in the stock of reserves held by central banks across the world (Graph 7). As is well known, this war chest of reserves was built primarily by emerging markets, notably in Asia.

Current account balance as percentage of GDP, 1919–40 Graph 7



Source: Ilzetski, Reinhart, and Rogoff (2017).

A fast-growing literature has examined the causes of that growth. Some papers have stressed the precautionary, self-insurance motive (Gourinchas and Obstfeld (2012)). Indeed, the build-up of reserves has helped economies, particularly emerging Asian economies, insulate themselves from market gyrations. However, more economists are starting to argue that this excess reserve accumulation could create modern Triffin-like dilemma pressures.

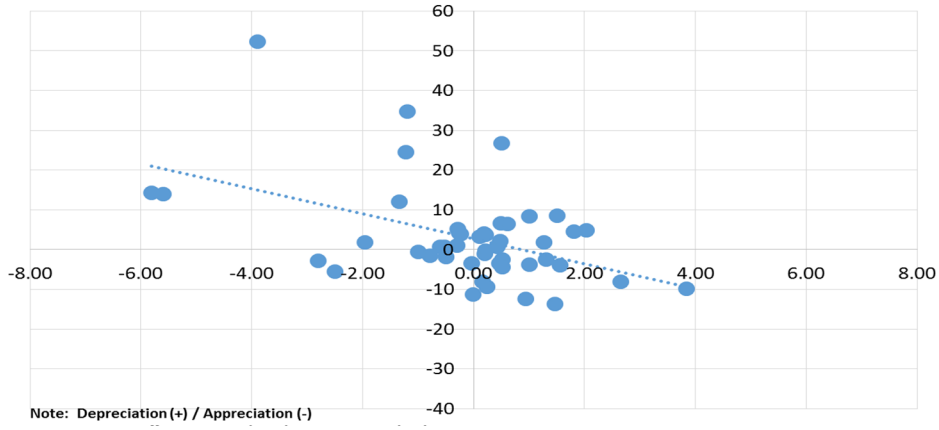
4. A flexible peso: living with the inevitables

With regard to the irreconcilable duo, the BSP's position takes a middle ground between the two extremes of the monetary policy debate spectrum. Both extremes have some validity. On global financial cycle for instance, the Philippines experienced a substantial reversal of capital flows in May 2013 (net portfolio outflow of US$640.8 million) during the taper tantrum period, despite having solid macroeconomic fundamentals in 2013 (ie gross domestic product (GDP) grew by 7.6% in the first semester). Nonetheless, the BSP is still able to enjoy monetary independence as evidenced by the successful achievement of its inflation target for six consecutive years (2009–14).

This means that maintaining a flexible exchange rate as grounded on our inflation targeting framework remains the appropriate and effective policy of choice. Flexible exchange rates act as an automatic stabiliser and contain wild swings in the financial markets.

Exchange rate flexibility (vertical axis, peso/dollar percent change) and growth forecast revisions (horizontal axis, in percentage points)
Philippines, 1994-2017

Graph 8



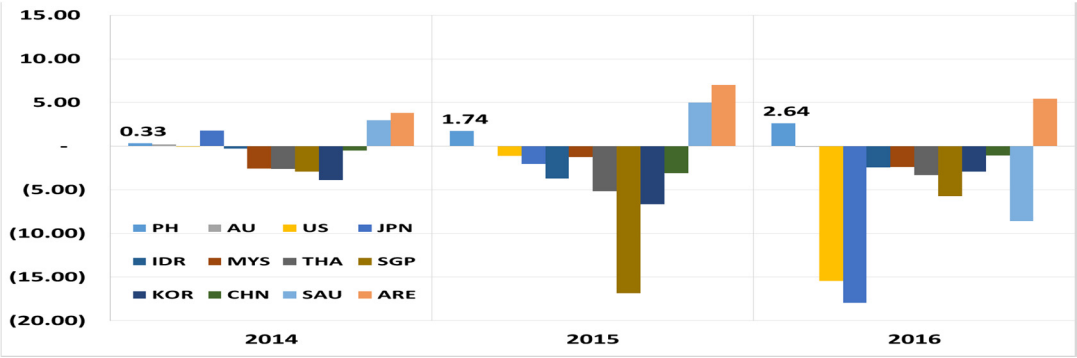
Source: BSP staff estimates, Bloomberg, IMF WEO database.

Graph 8 depicts how flexible exchange rates could perform this role. The horizontal axis refers to year-on-year changes in the World Economic Outlook (WEO) GDP forecast for the Philippines (proxy for output shocks), while the vertical axis refers to percentage changes in the nominal peso. The graph shows that, when output surprises on the upside, the peso appears to act as a buffer and tends to appreciate. Conversely, when the output shock is negative, the peso tends to depreciate. Interestingly, out of 44 instances, the peso adjusted correctly (or as expected) 27 times. Instances when peso adjustment deviated from the correct direction could

potentially be due to other factors. These suggest that, in most cases, the peso has acted as a buffer during output shocks.

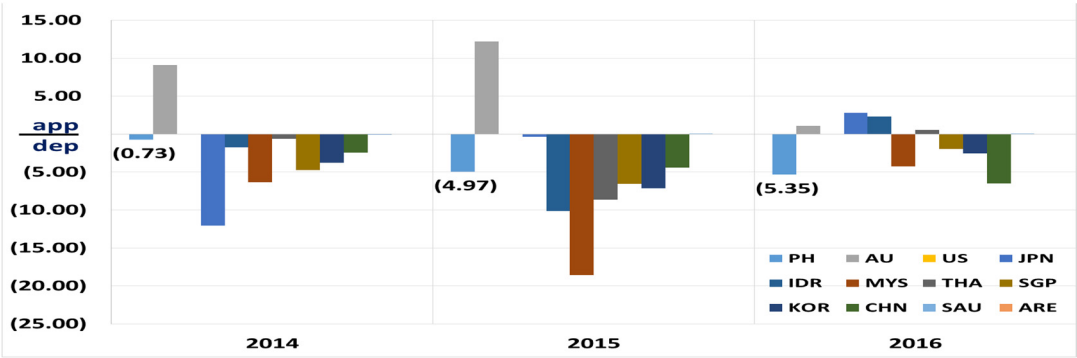
In addition, the current account adjustments needed for long-term growth are not a problem as adjustments appear to be borne by the flexible exchange rate. Graphs 9 and 10 depict recent conditions when the peso has been given the flexibility to adjust, including during periods when there has been high demand for imports.

Changes in imports (in US dollar millions)
Philippines and all major trading partners (except Hong Kong SAR) Graph 9



Source: World Bank and BSP DER Staff Estimates

Changes in exchange rates, in percent, 2012 to 2016, Philippines and trading partners
In currency per US dollar; depreciation (+); appreciation (-) Graph 10



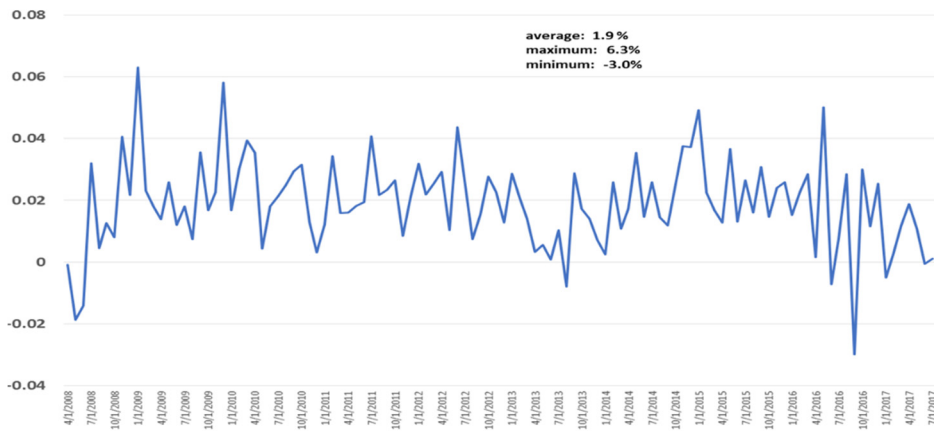
Source: Bloomberg and BSP DER Staff Estimates

Under a flexible exchange rate regime, speculative attacks on the peso have been limited as evidenced by the very small returns to carry trade for the peso. In the BSP's estimates of returns to carry trade (with the Philippine peso as investment currency), the incentive to exploit the arbitrage between peso and trading partner currencies, on average, is very small (around 1.9%). In other words, fluctuations and noise could be present from time to time, but there is no underlying profitability for shorting the domestic currency. In the end, exchange rate flexibility has allowed the market to move based on underlying market demand and supply for foreign exchange (returns could fluctuate but it moves around a steady average).

All of these support Obstfeld's (2015) findings that EMEs that adopt a flexible exchange rate are better positioned to moderate the impact of global financial and

monetary forces. Nonetheless, exchange rate adjustments do not insulate economies from external shocks and additional tools are needed.

Returns to carry trade for the peso against all trading partners
March 2008 to July 2017 Graph 11



Note: Average monthly returns to the previous months' level.

Source: BSP DER staff estimates.

5. Additional tools

The BSP also implements macroprudential and capital flow management policies to manage risks that could arise externally. Macroprudential policies are necessary to restore monetary policy independence for the EMEs. They complement the use of capital flow measures to insulate the economy from the global financial cycle. Temporary controls could be used, especially on credit flows and portfolio debt when the cycle is in a boom phase. This option has been tested in various contexts such as the Chilean encaje (1991–98) and the Brazilian taxes on equity inflows (2010–11).

The BSP has expanded its policy toolkit to include macroprudential regulations that can be focused on specific risk sources. Contingency measures such as liquidity-enhancing facilities, rediscounting windows and regional firewalls, also boost the flexibility and effectiveness of the BSP's actions. These have helped maintain the smooth functioning of markets.

Finally, the BSP focuses on improving transparency through communication, and thereby building and maintaining institutional credibility. In the era of globalisation, the expectations channel has increased its relevance as a transmission channel of monetary policy. Thus, it has been the proactive thrust of the BSP to ensure that markets clearly understand the objectives and direction of monetary policy. In the Philippines, communication is an essential pillar of the inflation targeting framework. After every policy meeting, the Monetary Board holds a press conference to explain the most recent decision on rates. This is followed by the release of the Highlights of the Meeting after six weeks, the Inflation Report and Letter to the President every quarter, and then the Annual Report during the following year.

Thus, building credibility and transparency is also important in the context of greater financial globalisation. A credible monetary policy can effectively anchor expectations and thus make monetary policy more effective.

6. Conclusion

The challenges associated with financial integration and their impact through exchange rate dynamics have complicated the conduct of monetary and exchange rate policy. Nonetheless, the flexibility of the peso has served as an effective first line of defence to dampen the impact of global financial and monetary shocks.

Moreover, the BSP is also looking for fresh approaches to further insulate the domestic economy from external shocks. To this end, the BSP has implemented a number of refinements and complementary tools to its existing monetary policy framework (inflation targeting or IT), which include the following:

- *Strengthening the transmission of monetary policy*. The period of strong capital inflows and liquidity growth following the global financial crisis has tempered the transmission of monetary policy to market interest rates. In this regard, the BSP has implemented an interest rate corridor (IRC) framework for its monetary operations. The IRC could potentially improve monetary transmission as the BSP now has greater flexibility to manage parts of the yield curve (seven days, 28 days, etc). This makes it easier to transmit policy settings to specific tenors of financial intermediation activities. Going forward, operational refinements to the IRC facilities will be critical in ensuring that liquidity conditions remain consistent with the prevailing outlook for inflation and growth.
- *Enhancing the BSP's capabilities in pursuing its objectives.* The BSP continues to pursue various amendments to its Charter that will enhance its ability to maintain price stability while promoting sustainable and inclusive growth. These amendments include, among others:
- The explicit inclusion of promoting financial stability, in addition to maintaining price stability, in its mandate;
- An increase in the BSP's capitalisation, which would enhance its credibility and capacity to ward off risks to the financial system and the broad economy and could therefore raise the integrity and authority, solid grounding and independence of the BSP; and
- Restoration of its ability to issue its own debt instruments, as a way of augmenting its monetary policy toolkit.
- Improving coordination with the government and private sector, including initiatives for data-sharing and capital market development. The BSP continues to work closely with its counterparts in other government agencies as well as with the private sector in the collection (and dissemination) of data needed to improve its forecasting and supervisory capabilities. Efforts to develop new financial services/products and to align financial regulations with international standards are also ongoing.
- Enhancing macro-financial surveillance. There is a need for an overarching framework for macro-financial surveillance that could squarely identify, measure, and manage vulnerabilities, risks and shocks with a view to effectively preventing a potential crisis. Hence, it is imperative to widen our range of tools and measures

that could cover different aspects of potential shocks to the economy. The BSP has expanded its surveillance tools to better monitor risks and vulnerabilities. Tools involve employment of a suite of quantitative models that attempt to address one or more aspects of systemic risks. These include, among others: (i) the Early Warning Systems (EWS); (ii) the Philippine Composite Index of Financial Stress (PCIFS); and (iii) the Spillover Index and other indices that measure macro-financial conditions.

In future, deeper cross-border financial integration, especially in the light of freer capital flows under the ASEAN Economic Community, could also pose challenges to the conduct of monetary policy in terms of assessing the potential impact of greater financial integration.

References

Allon, J, V Delloro and J Fernandez (2017): "Measuring Philippine financial connectedness: a variance decomposition approach", Bangko Sentral ng Pilipinas, forthcoming.

Diebold, F and K Yilmaz (2009): "Measuring financial asset return and volatility spillovers, with application to global equity markets", *Economic Journal*, vol 119, pp 158–171.

——— (2012): "Better to give than to receive: forecast-based measurement of volatility spillovers", *International Journal of Forecasting*, vol 28, no 1, pp 57–66.

——— (2014): "On the network topology of variance decompositions: measuring the connectedness of financial firms", *Journal of Econometrics*, vol 182, no 1, pp 119–34.

The Economist (2016): "The Mundell-Flemming trilemma: two out of three ain't bad", *Economics Brief*, 27 August 2016, www.economist.com/news/economics-brief/21705672-fixed-exchange-rate-monetary-autonomy-and-free-flow-capital-are-incompatible.

Gourinchas, P-O and M Obstfeld (2012): "Stories of the twentieth century for the twenty-first", *American Economic Journal: Macroeconomics*, vol 4, no 1, January, pp 226–65.

Institute of International Finance (2017): "Capital flows to emerging markets: eye of the Trumpstorm", 8 February 2017.

International Monetary Fund (2016): "The growing importance of financial spillovers from emerging market economies", *Global Financial Stability Report,* April 2016, www.imf.org/en/Publications/GFSR/Issues/2016/12/31/Potent-Policies-for-a-Successful-Normalization.

Ilzetzki, E, C Reinhart and K Rogoff (2017): "Exchange arrangements entering the 21st century: which anchor will hold?", *NBER Working Papers*, no 23134, February, www.nber.org/papers/w23134.

Meese, R and K Rogoff (1983): "Empirical exchange rate models of the seventies: do they fit out of sample?", *Journal of International Economics*, vol 14, pp 3–4.

Obstfeld, M (2015): "Trilemmas and trade-offs: living with financial globalisation", *BIS Working Papers,* no 480, January, www.bis.org/publ/work480.pdf.

Rey, H (2013): "Dilemma not trilemma: the global financial cycle and monetary policy independence", in *Global dimensions of unconventional monetary policy*, proceedings of the Federal Reserve Bank of Kansas City Jackson Hole symposium, 2013, pp 285–333.

Triffin, R (1960): Gold and the dollar crisis: the future of convertibility, Yale University Press.