

Monetary policy frameworks in EMEs: practice ahead of theory

Speech by Claudio Borio
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Good afternoon, ladies and gentlemen.

Since the Great Financial Crisis (GFC), there has been much soul-searching in a number of advanced economies about their monetary policy frameworks, strained by the need to nurse economies back to health and by stubbornly low inflation.

Emerging market economies (EMEs) have had less reason to review their frameworks. These economies fared better during the GFC. That said, since then they have had to tackle the challenge of the spillovers of very accommodative conditions in advanced economies.

The evolution of EME monetary policy frameworks dates back to the late 1990s. This was largely in response to the Asian financial crisis. Since then, we have seen a widespread adoption of inflation targeting alongside a greater degree of exchange rate flexibility. But importantly, except for a few cases, not quite free-floating – more common among advanced economies. Moreover, these monetary policy frameworks have been complemented by the active use of macroprudential measures.

This is yet another case of practice moving ahead of theory. It resembles the adoption of inflation targeting by some advanced economies in the early 1990s. Standard textbooks, in fact, prescribe freely floating regimes.

In this year's Annual Economic Report, we examine the practice of inflation targeting in EMEs. The key question we address is: why do so many EME inflation targeters combine it with foreign exchange intervention – and, increasingly, with macroprudential measures?

Let me highlight three takeaways:

- First, a key factor underlying the choice of monetary policy frameworks is that EMEs are more sensitive to capital flows and exchange rate fluctuations than advanced economies.
- Second, this worsens two potential monetary policy trade-offs. It can make it harder to stabilise output and inflation at the same time; and it can make it harder to reconcile macroeconomic, financial and price stability today with macroeconomic, financial and price stability tomorrow.
- Third, FX intervention, combined with macroprudential measures, can help address these two trade-offs, as it adds a valuable degree of freedom. In fact, FX intervention has many macroprudential-like features.

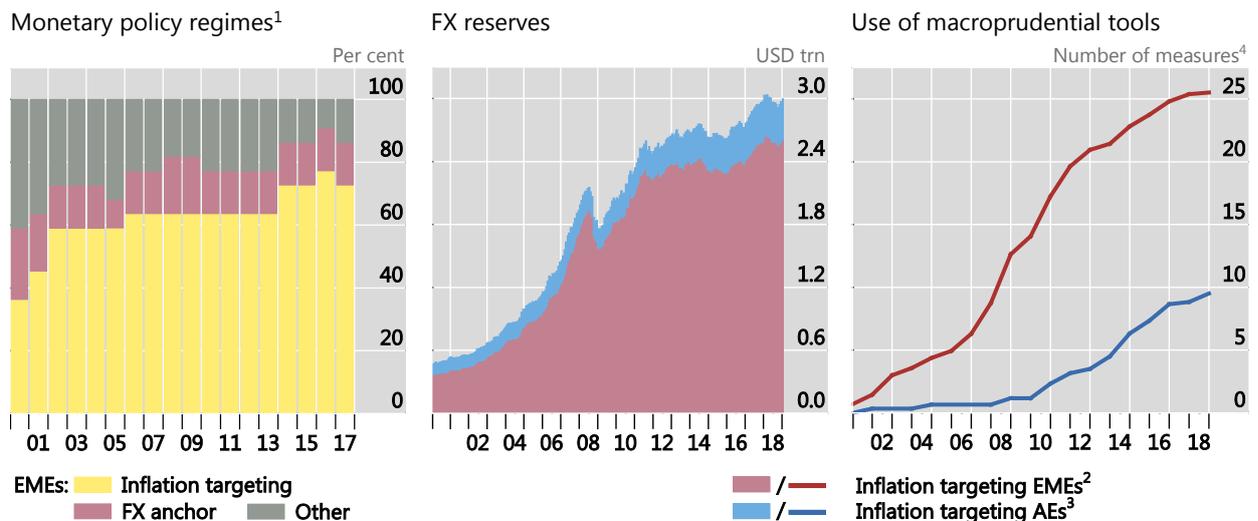
Let me first provide some context and then take each point in turn.

I – Context and EME specificities

Graph 1 traces the evolution of monetary policy frameworks in EMEs. Since 2000 the percentage of inflation targeters has increased substantially in EMEs (left-hand panel, yellow bars). Still, FX reserves have surged (centre panel, red bars), much more than in advanced economies (blue bars), in part reflecting EMEs’ greater tendency to lean against the exchange rate. Moreover, we see that EMEs have used macroprudential measures more actively than advanced economies (right-hand panel).

EMEs adopt inflation targeting but not free floating

Graph 1



¹ EMEs = AR, BR, CL, CN, CO, CZ, HK, HU, ID, IN, KR, MX, MY, PE, PH, PL, RU, SA, SG, TH, TR and ZA; AEs = AU, CA, CH, DK, EA, GB, JP, NO, NZ, SE and US. ² BR, CL, CO, CZ, HU, ID, IN, KR, MX, PE, PH, PL, RU, TH, TR and ZA. ³ AU, CA, GB, NO, NZ and SE. ⁴ Cumulative sum of the average number of measures per country.

Sources: K Budnik and J Kleibl, “Macroprudential regulation in the European Union in 1995–2014: introducing a new data set on policy actions of a macroprudential nature”, *ECB Working Papers*, no 2123, January 2018; D Reinhart and R Sowerbutts, “Macroprudential policies: a granular database”, Bank of England, *Working Papers*, no 632, December 2016; I Shim, B Bogdanova, J Shek and A Subelyte, “Database for policy actions on housing markets”, *BIS Quarterly Review*, September 2013, pp 83–95; IMF, *Annual Reports on Exchange Arrangements and Exchange Restrictions* and *International Financial Statistics*; national data; BIS calculations.

As seen in Graph 2, these frameworks have served EMEs well. Inflation, while higher, has tended to converge to that in advanced economies (left-hand panel). In addition, growth has been quite good (centre panel). That said, rapid credit growth may represent a risk going forward (left-hand panel). I will come back to this.

A perennial challenge EMEs face is that they are highly sensitive to capital flows and exchange rate fluctuations. Graph 3 shows the large waves of capital flows (red bars), the large swings in exchange rates (red line) and their close correlation. Both have a large impact on domestic financial markets and the economy more generally.

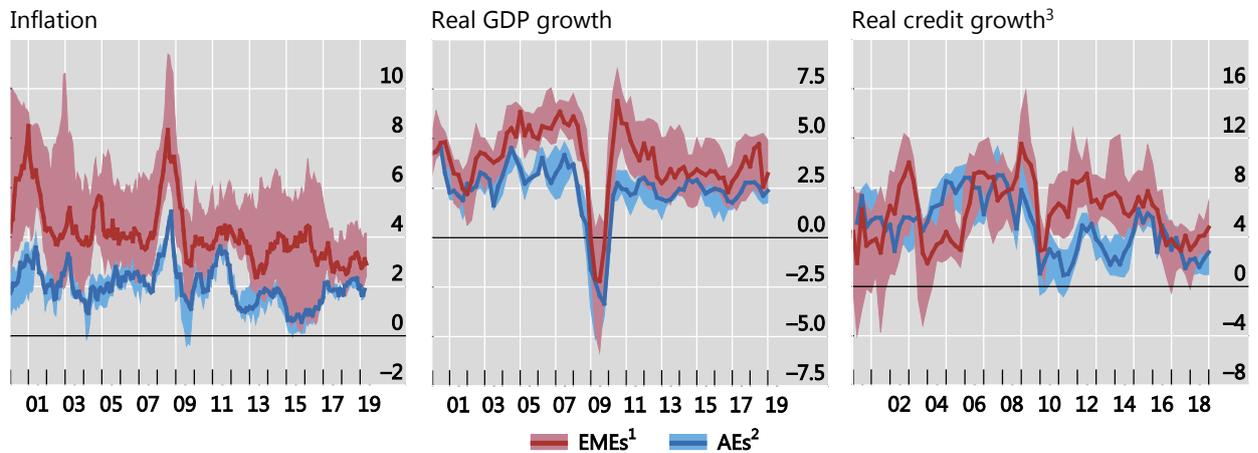
This higher sensitivity reflects, in part, structural features of EMEs.



Inflation, growth and credit in inflation targeting economies

Year-on-year changes, in per cent

Graph 2



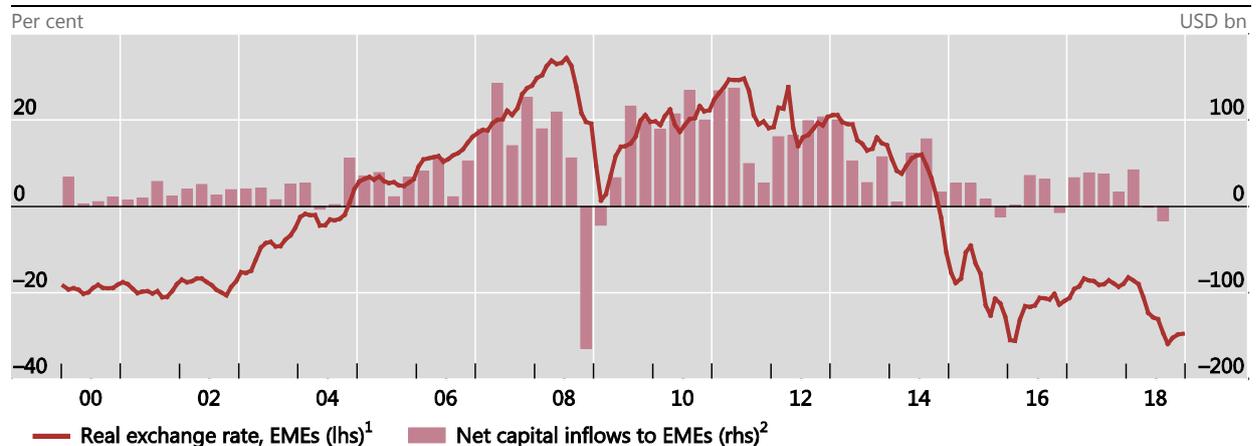
The panels show median values with interquartile ranges.

¹ BR, CL, CO, CZ, HU, ID, IN, KR, MX, PE, PH, PL, RU, TH, TR and ZA. ² AU, CA, GB, NO, NZ and SE. ³ Total credit to the non-financial sectors, deflated by consumer price indices.

Sources: National data; BIS total credit statistics; BIS calculations.

EMEs face large exchange rate and capital flow swings

Graph 3



EMEs = BR, CL, CO, CZ, HU, ID, IN, KR, MX, PE, PH, PL, RU, TH, TR and ZA; AEs = AU, CA, GB, NO, NZ and SE.

¹ Weighted average of bilateral US dollar exchange rates, based on GDP and PPP exchange rates; deviation from the long-term linear trend. An increase indicates appreciation of the domestic currencies. ² Sum of direct, portfolio and other investments, excluding reserves and related items.

Sources: IMF, *Balance of Payments Statistics* and *International Financial Statistics*; national data; BIS calculations.

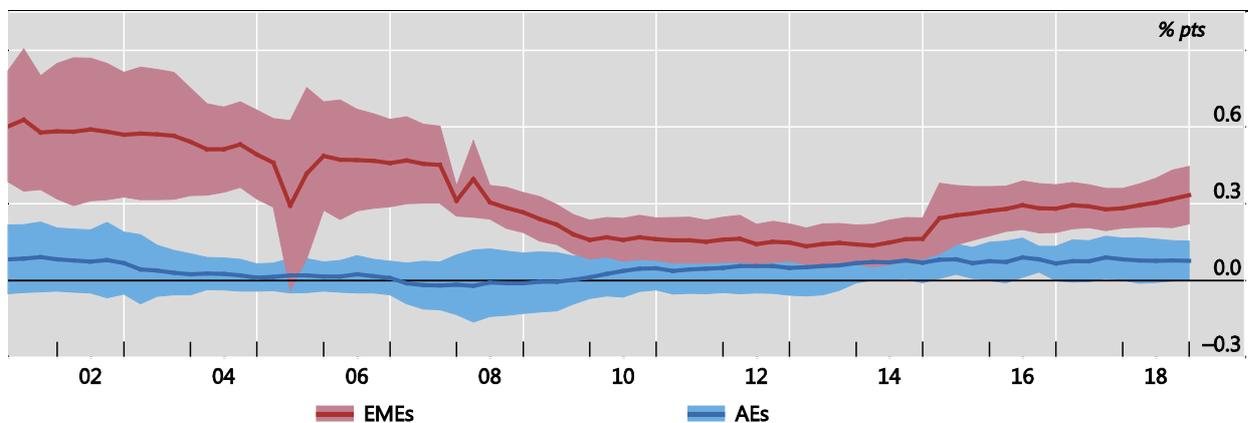
One set of features relate to aspects that are real in nature: the larger weight of food in the consumption basket and stronger second-round effects in wages tend to make inflation more responsive to the exchange rate. We see in Graph 4 that while pass-through in EMEs has declined (red line, and range), it is still generally above that in advanced economies (blue line). To be sure, there are substantial regional differences. Pass-through in Asia is generally lower than in Latin America. But overall, inflation expectations are less well anchored in the face of exchange rate fluctuations in EMEs than in advanced economies.

The other set of factors are financial in nature. The domestic institutional investor base is generally not as developed as in advanced economies. As the left-hand panel of Graph 5 shows, the size of such investors as a percentage of GDP is smaller than in a representative sample of advanced economies. Partly as a result, market depth – the ability to absorb purchases and sales without large price moves – tends to be lower and, above all, instruments with which to hedge FX exposures are less available; the right-hand panel illustrates this. We see that FX derivatives turnover, scaled by GDP, is lower in EMEs than in advanced economies. Moreover, these two factors are closely related. An institutional investor base that also invests in foreign currency could act as a natural counterpart to the hedging needs of domestic firms. Chile’s experience highlights the relevance of this factor. These features become especially relevant when considered in relation to the size of capital flows that can buffet EMEs.

Exchange rate pass-through is higher in EMEs^{1, 2}

In inflation targeting economies

Graph 4



EMEs = BR, CL, CO, CZ, HU, ID, IN, KR, MX, PE, PH, PL, RU, TH, TR and ZA; AEs = AU, CA, GB, NO, NZ and SE.

¹ Coefficients are six-year rolling window long-run multipliers from the equation $Inflation_{it} = \alpha_i + \beta_i + \delta Inflation_{it-1} - \sum_{j=0}^5 \gamma_j \Delta NEER_{it-j} + \phi Outputgap_{it} + \varepsilon_{it}$. Sample starts in Q1 1995. For details, see M Jašová, R Moessner and E Takáts, "Exchange rate pass-through: what has changed since the crisis?", *International Journal of Central Banking*, forthcoming, 2019. Also published as *BIS Working Papers*, no 583. ² The ranges indicate the 90% confidence intervals.

Sources: Datastream; national data; BIS calculations.

This suggests that the importance of currency mismatches is greater in EMEs than in advanced economies. Not because the share of FX liabilities is higher there – it is not – but because the ability to hedge is lower and the cost higher.

The key point, then, is that currency mismatches amplify the impact of exchange rate fluctuations driven by external conditions regardless of whether currency mismatches are in borrowers’ or lenders’ balance sheets.

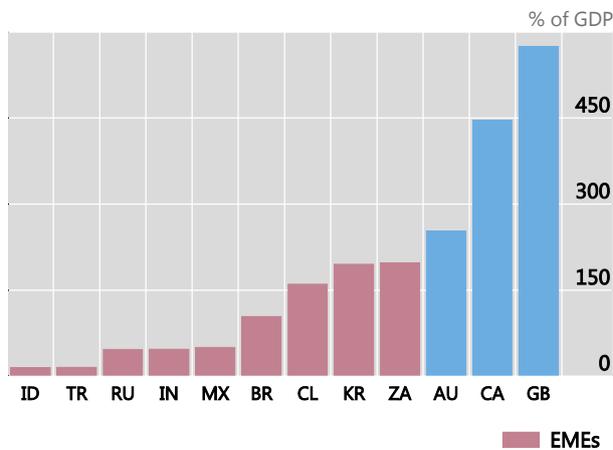
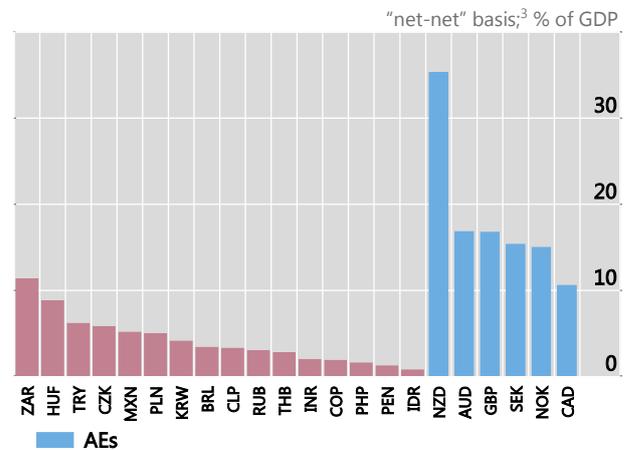
If borrowers have more liabilities than assets in foreign exchange, a, say, appreciation of the local currency improves their financial condition, encouraging further borrowing and lending in both foreign and domestic currency. If lenders (eg foreign investors) hold local currency assets on an unhedged basis, an appreciation would benefit them twice. Empirical evidence confirms this point. Since appreciations go hand in hand with declining yields, foreign investors would benefit from both currency and capital gains at the same time when returns are measured in their home currency.

These mechanisms naturally operate in reverse when the EME domestic currency depreciates. This is what is called the “financial channel of the exchange rate” (FCER).



Financial markets are not as developed in EMEs as in advanced economies

Graph 5

Assets of institutional investors¹Average daily turnover in FX derivatives markets²

¹ Sum of assets of insurance corporations, pension funds and other financial intermediaries. Financial assets when available, otherwise total assets; 2017 data. ² Volume is defined as the gross value of all new deals entered into during a given period, and is measured in terms of the nominal or notional amount of the contracts; based on the Triennial Central Bank Survey of Foreign Exchange and OTC Derivatives Markets in April 2016. For CLP, COP, CZK, IDR, PEN, PHP and THB, turnover may be underestimated due to incomplete reporting of offshore trading. ³ Over-the-counter (excluding spot transactions) and exchange-traded foreign exchange derivatives adjusted for inter-dealer double-counting within and across economies.

Sources: Financial Stability Board, *Global Monitoring Report on Non-Bank Financial Intermediation 2018*; BIS derivatives statistics; BIS calculations.

Over the past decade or so, the relevance of this channel has increased as a result of two developments portrayed in Graph 6. Foreign currency debt in EMEs has increased substantially (left-hand panel), and so has the participation of foreign investors in domestic markets (right-hand panel).

A key feature of the FCER is that it generates a self-reinforcing process. An appreciation loosens domestic financial conditions, induces further capital inflows, and hence loosens conditions further. Correspondingly, a depreciation tightens financial conditions and induces further capital outflows.

As I will discuss next, this financial channel-induced higher sensitivity of EMEs to exchange rate fluctuations worsens policy trade-offs. As a result, all else equal, it would also tend to reduce tolerance for free-floating exchange rates.

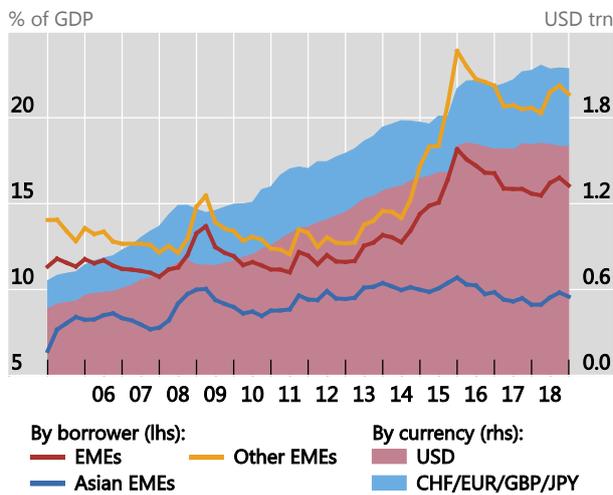


Foreign currency debt and foreign ownership raise vulnerabilities in EMEs

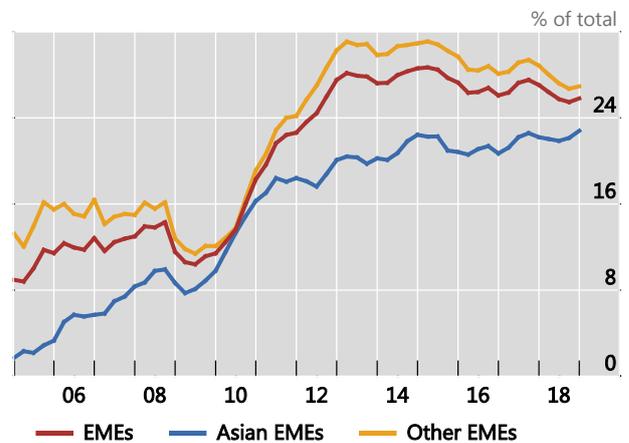
In inflation targeting economies

Graph 6

Foreign currency debt¹



Foreign ownership in local currency sovereign bond markets²



EMEs = BR, CL, CO, CZ, HU, ID, IN, KR, MX, PE, PH, PL, RU, TH, TR and ZA.

¹ Cross-border and local bank loans extended by LBS-reporting banks to EME non-bank borrowers and international debt securities issued by non-banks residing in EMEs. Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. ² Simple averages, excluding CL, CZ, IN, PH and RU due to data availability.

Sources: International Institute of Finance; IMF, *World Economic Outlook*; Datastream; Dealogic; Euroclear; Refinitiv; Xtrakter Ltd; national data; BIS locational banking statistics (LBS); BIS calculations.

II – Policy trade-offs

EME's high sensitivity to capital flows and exchange rate fluctuations through the FCER worsens two types of potential trade-off.

The first type of trade-off is that it becomes harder to stabilise output and inflation at the same time. The reason is that the FCER influences output and inflation in opposite directions. All else equal, a, say, exchange rate depreciation raises inflation but reduces output by tightening domestic financial conditions and dampening domestic demand. Moreover, it can also make it harder to finance exports, an effect which is amplified by global value chains. This is quite different from the standard trade channel of the exchange rate, which influences output and inflation in the same direction, so that a depreciation boosts exports by making the economy more competitive.

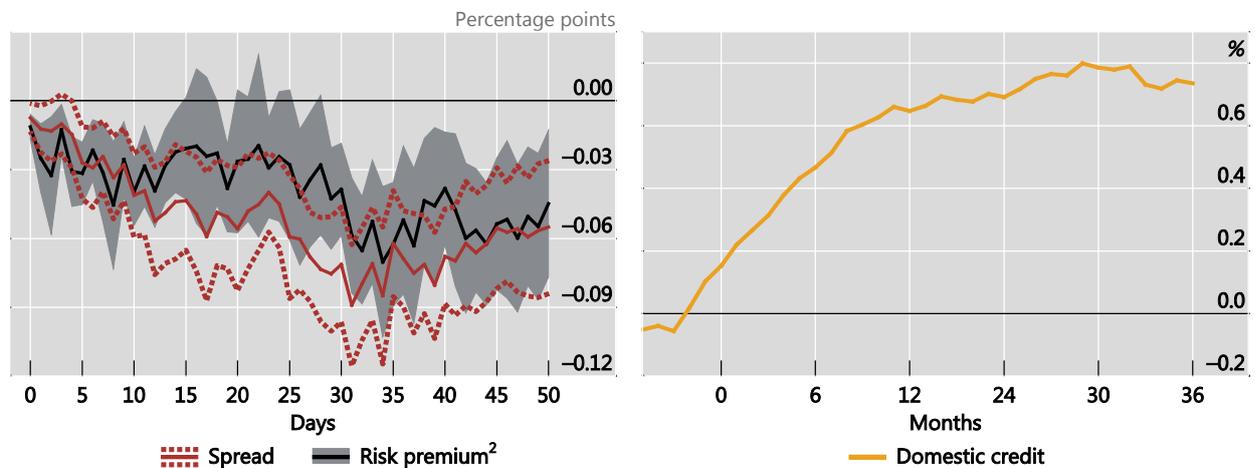
There is indeed empirical evidence suggesting that, all else equal, financial conditions in EMEs become looser as the exchange rate appreciates. The left-hand panel in Graph 7 shows that, in response to an appreciation, the spread between the local currency bond yield and the corresponding US Treasury yield (red line) as well as the credit risk premium (black line) decline in tandem and that domestic credit increases (right-hand panel).

In EMEs, exchange rate appreciation goes hand in hand with...

Graph 7

 ...impact of exchange rate appreciation¹

...domestic credit expansion



¹ Impact of a 1% appreciation shock to the bilateral USD exchange rate (log exchange rate changes on days of US and euro area monetary policy news) on EME local currency bond spreads and risk premium over a 50-day horizon. Control variables are the log change in the VIX index and the change in the domestic three-month money market rates. The 90% confidence bands are based on cross-sectional and period cluster robust standard errors. ² Spread between the five-year local currency government bond yield and a synthetic local currency five-year yield given by the sum of the five-year US Treasury yield and the five-year cross-currency swap rate. See W Du and J Schreger, "Local currency sovereign risk", *Journal of Finance*, vol 71, no 3, June 2016, pp 1027–69.

Sources: B Hofmann, I Shim and H S Shin, "Bond risk premia and the exchange rate", *BIS Working Papers*, no 775, March 2019; BIS calculations.

Inflation and output moving in opposite directions can create dilemmas for the central bank. Think, for instance, of the havoc caused by currency mismatches following sharp depreciations at times of financial crises. Should the central bank reduce interest rates to support output? Or should it raise them to control inflation? An advanced economy central bank would not face the same dilemma. A depreciation would be unambiguously expansionary.

This trade-off is exacerbated by two additional structural features in EMEs. For one, foreign currency (in fact, largely US dollar) invoicing is more prevalent than in advanced economies. This means that, in the near term at least, exports respond less to a currency depreciation. More importantly, as exchange rate pass-through tends to be higher in EMEs, inflation responds more strongly.

The second type of trade-off is that, under some circumstances, it becomes harder to reconcile macroeconomic, financial and price stability today with macroeconomic, financial and price stability tomorrow – an intertemporal trade-off.

This can occur through two mechanisms.

One is surges and reversals in capital flows and the associated exchange rate fluctuations. Capital flow surges can generate financial vulnerabilities owing to excessive risk-taking – that is, they raise the probability and costs of subsequent reversals.

The other mechanism is through the impact of these surges and reversals on domestic financial booms and busts, through credit and asset prices, notably property prices. We are all familiar with the serious damage that such domestic financial cycles can cause to the economy.

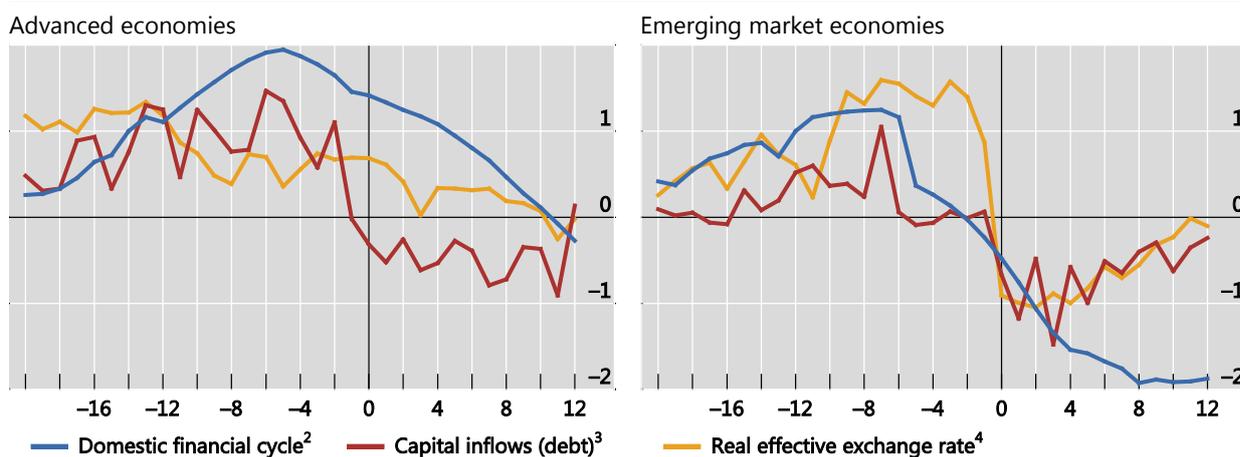
There is indeed considerable evidence that these mechanisms are at work and reinforce each other. Graph 8 shows the evolution of cross-border debt flows, the real exchange rate and a standard measure of the domestic financial cycle around times of financial distress (banking crises) – denoted by the vertical lines. We see that the expansion and contraction phases of the domestic financial cycle (blue line) tend to coincide with upswings and downswings in both cross-border debt flows (red line) and the

exchange rate (yellow line). But the pattern is more pronounced for EMEs, at least with respect to the exchange rate. This is consistent with more formal empirical evidence indicating that the combination of strong credit growth and exchange rate appreciation is a useful leading indicator of financial crises for EMEs, but not for advanced economies.

Behaviour of selected variables around crises¹

Country group medians, in standard deviations

Graph 8



¹ The horizontal axis denotes quarters around crises, with the start date set at zero (vertical lines). The median of the relevant variable is taken at the specific quarter across all crisis episodes available for the respective indicator. ² Composite financial cycle proxy calculated from frequency-based (bandpass) filters capturing medium-term cycles in real credit, the credit-to-GDP ratio and real house prices. ³ Debt components (portfolio investment debt and other investment) of gross capital inflows, scaled by GDP. ⁴ Geometric trade-weighted averages of bilateral exchange rates adjusted by consumer prices.

Sources: IMF, *Balance of Payments*; national data; BIS exchange rate statistics; BIS calculations.

Thus, overall, capital flows and the exchange rate amplify the domestic financial cycle, especially in EMEs.

It is easy to see how this can give rise to dilemmas for monetary policy. Imagine that inflation is below target and, owing to strong capital inflows, the currency comes under appreciation pressure. The central bank could then reduce interest rates to push inflation up, but that would tend to add further fuel to any domestic financial cycle expansion. Over time, this could risk generating a bust and inducing a capital flow reversal and exchange rate depreciation; or at a minimum, it would make the economy more vulnerable to a reversal of capital flows. Either way, the longer-term result would be the same: a contraction in economic activity and a burst in inflation linked to the sharp currency depreciation.

Thus, under such conditions, better economic performance today would be secured at the expense of worse economic performance tomorrow.

III – Policy implications

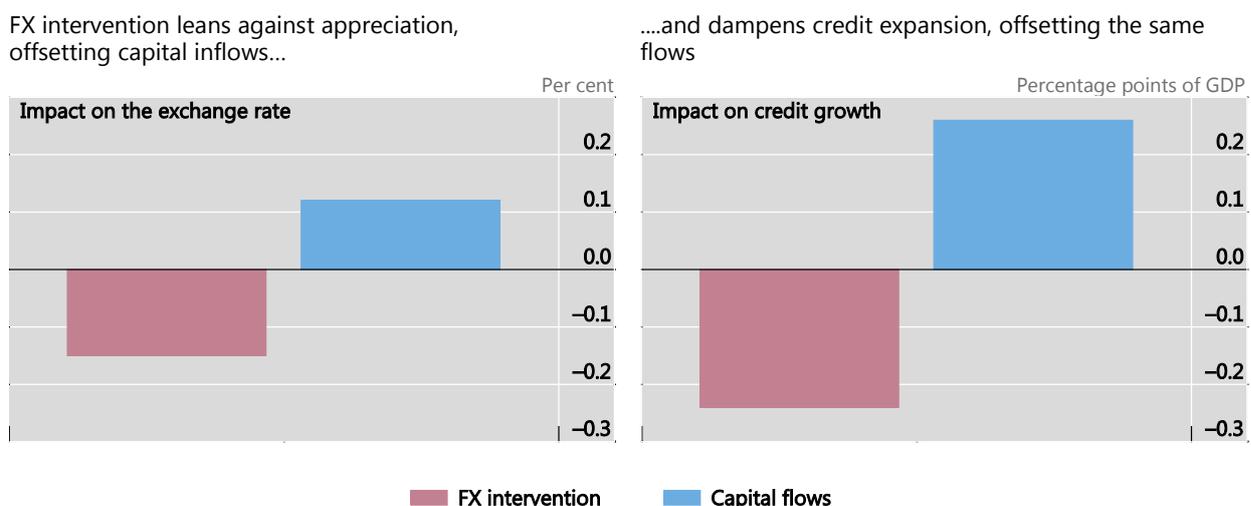
These considerations point to a key policy implication: wisely implemented, FX intervention can alleviate the two trade-offs I mentioned. Effectively, it instils a useful degree of freedom.

FX intervention improves the trade-offs primarily by dampening the impact of the FCER – ie in the short run, its opposite impact on inflation and output; and in the longer run, its impact on financial and macroeconomic vulnerabilities. Indeed, in this second case, FX intervention has strong

macroprudential-like features. To the extent that it leans against capital flows and their impact on the domestic financial cycle, it helps restrain the build-up in both at the same time. And by accumulating FX reserve buffers, it improves the resilience of the economy against reversals in both – for which function, in fact, it does not even need to influence the exchange rate.

There is indeed evidence that FX intervention can restrain the impact of capital flows on the exchange rate and domestic credit expansion. This is shown in Graph 9. In the left-hand panel, we see that FX purchases and capital inflows of the same size have roughly equal offsetting impacts on the exchange rate: the red and blue bars have roughly the same size. In addition, the FX purchases dampen credit growth, again offsetting the impact on it. Here, too, the two bars have roughly the same size (right-hand panel).

FX intervention mutes the financial channel of the exchange rate¹ Graph 9



¹ Coefficients from a panel regression analysis for 20 EMEs from 2000 to 2017. The dependent variable is the percentage change in the bilateral exchange rate against the US dollar (increase denotes an appreciation) and the change in the ratio of domestic credit to GDP, respectively. The regressors are the accumulation of FX reserves as well as net capital inflows, respectively, as a ratio to GDP. The control variables comprise the lagged dependent variable, the short-term interest rate spread against the United States, the log change in the VIX, the log change in the CRB commodity price index and country fixed effects.

Sources: IMF, *International Financial Statistics* and *World Economic Outlook*; Bloomberg; Datastream; national data; BIS calculations.

That said, FX intervention is no panacea. As the evidence indicates, its effect on the exchange rate is temporary, so that it would need to be used repeatedly when seeking to dampen exchange rate fluctuations. In addition, intervention often involves large costs because the return on the foreign exchange assets is typically lower than the cost of the liabilities that fund them. And, in an extreme scenario, were it to be perceived as a form of insurance and to reduce the sense of two-way risk, FX intervention could encourage further inflows and, in the longer run, those very currency mismatches that are at the origin of vulnerabilities.

This suggests that a balanced policy approach would embed wisely executed FX intervention in a broader macro-financial stability framework. An essential element of such a framework is macroprudential measures. These measures, largely targeted to address the potential intertemporal trade-offs, can strengthen the resilience of the financial system, help restrain domestic financial booms and busts, and address currency mismatches directly. We analysed their strengths and limitations in some detail in a special chapter of last year's Annual Economic Report. In some cases, such macroprudential frameworks have also been complemented with capital flow management measures – a tool which, given its limitations, is best used sparingly.



There are clearly a number of difficult questions that need to be addressed to work out a full analytical basis for such a holistic framework and to implement it. The range of questions involves strategy, tactics and institutional arrangements, including the role of interest rate policy. But, again, EME practice has moved ahead of theory. And the direction of travel is clear.

Thank you.