Avoiding "regulatory wars" using international coordination of macroprudential policies

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Introduction

Financial spillovers and spillbacks have increased significantly in magnitude since the Global Financial Crisis (GFC) posing a threat to financial stability. Using macroprudential policies (MaPs) following systematic countercyclical rules reduces volatility and contributes to financial stability, growth and investment. However, a multiplication of non-systematic, local MaPs, and capital flow management (CFM) measures including more aggressive capital controls, might result in a "regulatory war" and reduce global welfare. Instead, other avenues could be explored, as demonstrated by the adaptability of the policy frameworks used by emerging market economies (EMEs). They have constantly evolved as a result of lessons learned from crises and that should include the GFC. This evolution is part of a learning curve that uses past crisis experiences, policymaking and research to prevent vulnerabilities from developing into full-blown future crises. These remarks are meant to show how this process occurs, its importance for global stability and a last but much needed "new lesson". Global financial stability needs international coordination on MaPs between major EMEs (those that represent a large combined share of the global economy) and the major advanced economies (AEs).

These remarks are structured as follows. First, we go slightly back in time and look at the way in which EME economic policy frameworks have responded to the EME crises of the 1990s: adding "pragmatic flexibility" to manage the impossible trinity and obtain positive results. The motto was "keep your house in order". Second, we look at the new challenges that have emerged since the GFC, especially financial spillovers in the form of larger than usual capital inflows and financial volatility in EMEs. Against this background, EME policymakers found it increasingly difficult to maintain internal and external economic balances with their usual policy toolkit. Third, many of them responded by considering new policy goals (financial stability) and supplementing traditional macroeconomic policies with new instruments such as MaPs, FX interventions and/or CFM tools in what can be called an integrated inflation targeting (IIT) framework. Fourth, even this IIT, however, could only restore some but not full "order in the house". EMEs were still subject to high volatility during episodes of sudden changes in global investor sentiment. Consequently, a tendency to use MaPs and various forms of CFMs, including capital controls, more frequently has emerged where MaPs and CFMs are used in an ad hoc non-systematic manner, the more

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they also begin to have spillback effects on AEs and other EMEs. Therefore, this type of policy action might inadvertently contribute to lower long-term growth and thus to a loss of global welfare (see Boar et al (2017)). This leads us to our fifth and final point. Drawing on recent research, we argue that the EME policy framework needs to evolve further than the IIT to meet these new challenges. Our view is that not only do EMEs need to enlarge their toolkit of policies by adding MaPs, but they also need to propose to AEs some degree of international coordination on MaPs. This could be a mutual improvement vis-à-vis a world that relies on using ad hoc capital controls to fence off unwarranted imported financial volatility. Avoiding this type of "regulatory" macroprudential "war" could be a more efficient way to achieve higher global social welfare and a common good for macroeconomic and financial stability in both AEs and EMEs.

1. From macroeconomic populism to pragmatic policy frameworks in EMEs

Policy inconsistencies played an important role in the EME financial crises in the 1980s and 1990s. A well documented illustration is seen in the illusion that, in open economy settings with a pegged or fixed exchange rate, one could run expansionary policies on both the fiscal and monetary fronts for prolonged periods of time even if they produced growing imbalances (ie large current account deficits and rising debt, both public and private, domestic and foreign). In Latin America in particular, (some) policymakers had a history of embracing expansionary fiscal, monetary and financial (credit or quasi-fiscal) policies with a disregard for fiscal and foreign exchange constraints.[2] Attempts to bypass the macroeconomic trilemma of defending a fixed exchange rate regime, full capital mobility and monetary policy independence (Obstfeld et al (2005)) with these inconsistent policies caused many EMEs to end up with unsustainable imbalances, creating too large a stock of reported liabilities vis-à-vis their assets and buffers (eg FX reserves). Hence, in pursuing conflicting objectives, credibility problems arose and, for example, maturity and currency asset-liability mismatches eventually led to well known EME currency and/or banking crises.

Drawing the lessons from these crises, many EMEs adopted a more prudent and "pragmatic" approach to managing the trinity's constraints (Graph 1). Most switched to a floating (but managed) exchange rate as the first line of defence against external shocks. That was often complemented by building external buffers (international reserves) and/or gaining and securing access to multilateral liquidity arrangements from international financial institutions. EME central banks also shifted to monetary regimes such as a (flexible) inflation targeting (IT) to achieve price stability and build progressively increasing credibility. At the same time, fiscal authorities began keeping public debt within reasonable limits through legally binding rules. Finally, some EMEs opened their capital account but maintained some defensive measures and used microprudential tools to ensure that the local financial system was well capitalised and able to withstand external shocks.

The adoption of this pragmatic framework significantly improved the macroeconomic performance of EMEs, at least up to the GFC. First, the EMEs as a whole (even excluding China) restored both external and internal balances. Their aggregate current account balance went from a deficit to a substantial surplus while the fiscal deficit contracted sharply (Graph 2, upper panels).[3] During this period, consumer prices stabilised and growth continued to outpace that of the AEs (Graph 2, lower panels). Hence, consistent policies paid off. However, the improved performance faded around the time of the GFC. Since then, EMEs' external and internal balances have deteriorated and growth has slowed, although it stabilised somewhat in 2016.

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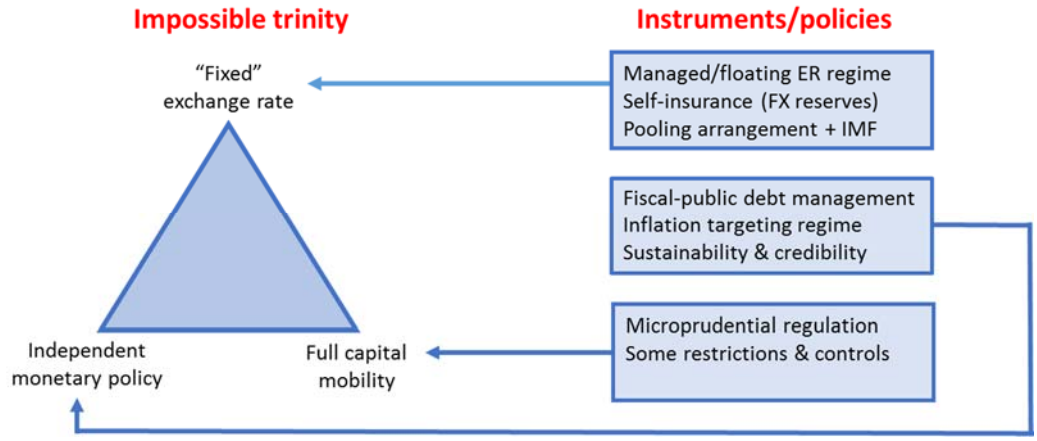
[2] Dornbusch and Edwards (1991) characterised as "macroeconomic populism" the policy regime that emphasises growth and income redistribution while de-emphasising the risks of inflation, debt finance and external constraints.

[3] In part, China's continously strong growth, which boosted demand for commodities during early 2000s, contributed to the improvement of the current account balance in many commodity-producing EMEs.

Keep your house in order

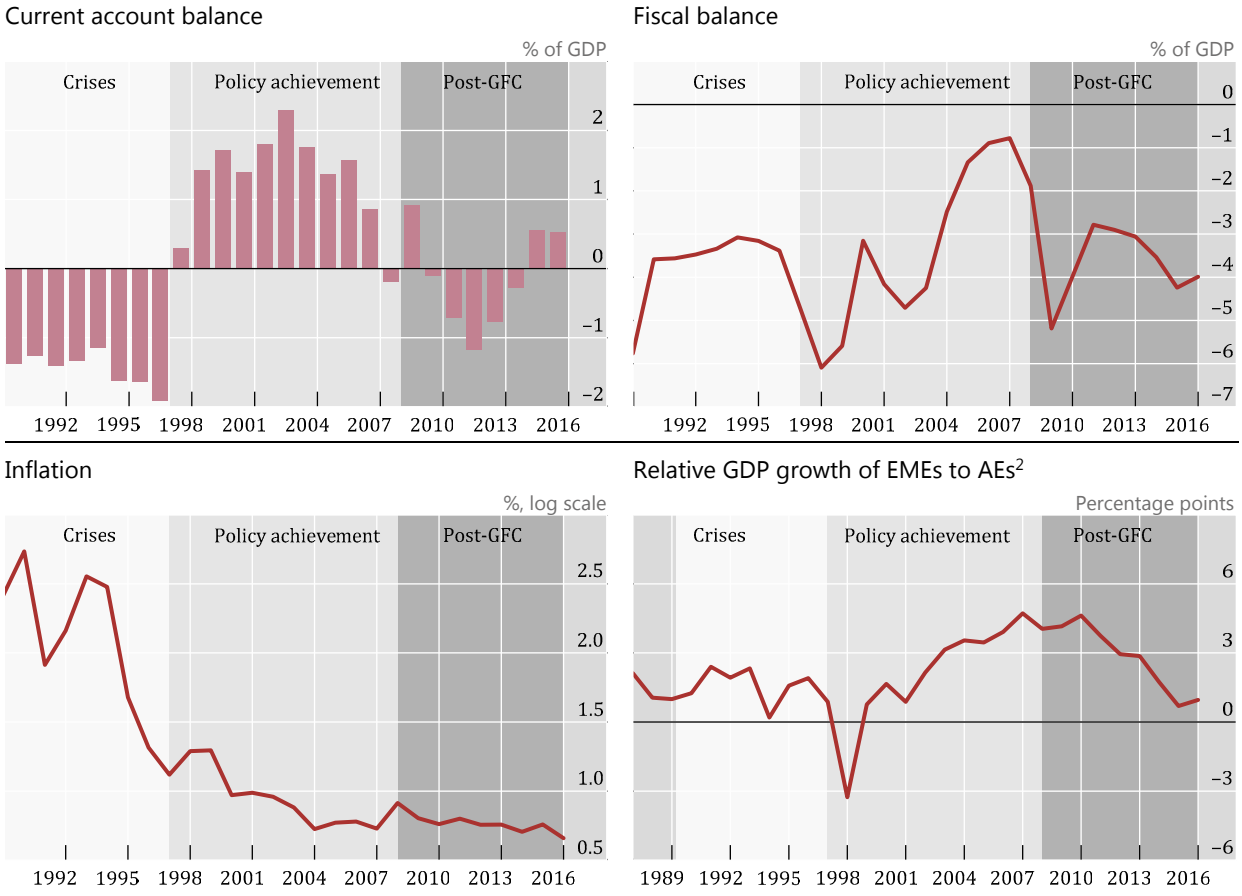
Graph 1



Source: Pereira da Silva (2016a).

Economic indicators of major emerging market economies (excluding China)[1]

Graph 2



[1] The periods considered are: "Crises" – the pre-Asian crises; "Policy achievement" – post Asian crises until the GFC. Regional aggregates are calculated as 2010 GDP-PPP weighted averages. For EMEs, Argentina, Brazil, Chile, Chinese Taipei, Colombia, the Czech Republic, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Thailand and Turkey; for AEs, Canada, the euro area, Japan, the United Kingdom and the United States. [2] Real GDP growth for EMEs minus real GDP growth for AEs.

Sources: IMF, *World Economic Outlook*; Asian Development Bank; national authorities; BIS calculations.

2. The post-GFC financial spillovers and its collateral effects on EMEs

The change in macroeconomic performance around the GFC raises the question of why the successful and pragmatic framework devised by EMEs was no longer sufficient to continue assuring financial and output/price stability. Was this the result of an already fading business cycle (the end of the commodity supercycle)? Did it reflect an insufficient countercyclical policy reaction by the authorities and central banks that need to step up the intensity and efficacy of their existing set of tools? Or was it the result of some missing instrument in their toolkit? To be sure, these questions will require deeper research and will take time to settle.

In our view, by 2006–07, there were already signs that the tailwinds for EMEs had slowed. The commodity supercycle was fading and the financial exuberance in AEs that led eventually to the subprime crisis had produced its first casualties. But the EMEs had managed to accumulate buffers and credibility as described earlier. Therefore, when the GFC struck, in 2008–09, most of them were capable of using – and they did use – expansionary countercyclical macroeconomic policies.[4] In fact, the call for a strong and coordinated expansionary response came from the G20 itself and worked well in 2009.[5] But two key factors played a negative role. First, the massive loss of business confidence in AEs obviously affected EMEs as well through what can be called the "CNN channel" (eg the cascade of bad economic and financial news). Despite the strong and timely policy responses in AEs, animal spirits were affected globally and naturally in EMEs. Second, the post-GFC policy response in AEs, ie the accommodative policies, starting with that of the United States, which "saved the world" from another Great Depression inevitably produced collateral effects in EMEs.

That US monetary policy has always been an important driver of the co-movements in asset prices and capital flows elsewhere – often referred to as the global financial cycle (see, for example, Bruno and Shin (2015), Rey (2013) and Miranda-Agrippino and Rey (2015)) – is nothing new. Actually, an explanation of this link is quite old and stems from the global dominance of the US dollar, both as an invoicing currency and a funding currency. Because of this dominance, US monetary policy decisions affect EMEs through both flow and stock effects. For example, for the global banks and their branches that grant short-term dollar credit funded by issuing floating-rate dollar debt across countries, changes in US monetary policy will have an immediate cash flow effect. In addition, the fact that many households, financial and non-financial corporations around the world hold dollar-denominated or dollar-linked assets, changes in US monetary policy affect the net worth of their assets, and thus, via collateral effects, their ability to borrow.

What was new during the GFC was the magnitude of the spillover effects from unconventional monetary policies (UMPs). UMPs combine ultra-low policy rates and the compression of term premia through asset purchase programmes (quantitative easing or QE) and the management of expectations using communication or forward guidance. They were adopted by the Federal Reserve after the GFC and subsequently by other major central banks (eg the Bank of England, Bank of Japan and European Central Bank). UMP has not only amplified the old transmission channels of US monetary policy but also brought new interactions. Caruana (2013, 2015) highlighted five distinct but overlapping channels through which monetary policy spills over from AEs to EMEs: (i) low bond yields in AEs due to asset purchases affected

[4] Throughout most of their recent economic history, EMEs had to cope with the lack of credibility and their "original sin" and hence were obliged to pursue contractionary fiscal and monetary policies every time a confidence crisis struck global markets causing the usual "flight-to-quality" and a consequent spike in risk premia of EME assets.

[5] See G20 Leaders' Statement at the Pittsburgh Summit, 24–25 September 2009. Needless to say, the natural political economy inclination in any country, regardless of ideological inclination, is to implement and thrive on the expansionary part of countercyclical macroeconomic responses to crisis. In some EMEs, the call for a coordinated G20 response was understood (or interpreted) as a "license to spend" beyond the limits of prudence. With an implicit G20 endorsement, markets too showed some complacency for this spending spree and indirectly allowed a mispriced reversal of the stronger policies and gains that we alluded to earlier.

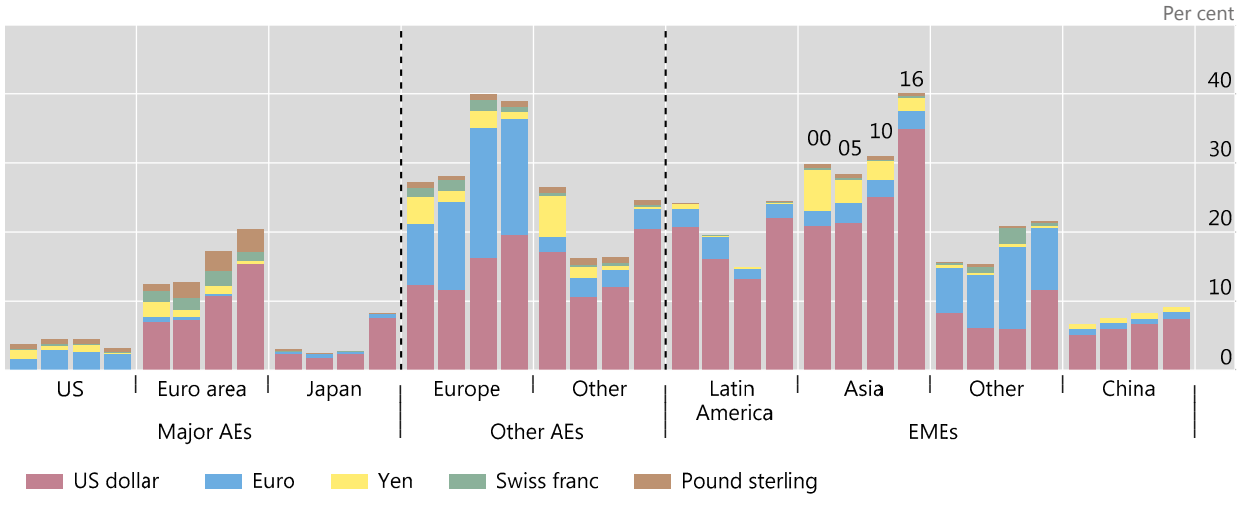
EME local bond markets through portfolio re-balancing effects; (ii) EME central banks reacted initially to the lower policy rates in the AEs by also keeping lower short-term policy rates; (iii) capital inflows from AEs put upward pressure on EME currencies; (iv) low dollar interest rates facilitated a boom in external borrowing; and (v) larger than usual amounts of capital flowed into EMEs.

Admittedly, the interactions between these channels are complex and have not been fully analysed previously in general equilibrium. As mentioned before, these expansionary policies did prevent another Great Depression by stabilising the financial downturn in AEs but they also had other less positive effects. For example there is detailed work in partial equilibrium that convincingly shows the build-up of global financial systemic risk when financial conditions are kept accommodative for long periods of time. Take, for example, the strong link between exchange rates and domestic government bond yields that works through the so-called *risk-taking channel of exchange rates* (Bruno and Shin (2015)). Ample post-GFC dollar liquidity and low US rates encouraged EME corporations to raise funds in international capital markets, contributing to a sharp rise in US-dollar liabilities in the early 2010s (Graph 3). Accounting rules and the weaker dollar flatters the balance sheet of these corporates when the value of their liabilities falls relative to that of their assets, thereby enabling global creditors to extend even more credit to them. In other words, their creditworthiness fluctuates more with exchange rate movements than with any other factor. Hofmann et al (2017) find that a depreciation of an EME currency against the US dollar is associated with a widening in local currency bond spreads, consistent with the rationale of the risk-taking channel.

Indeed, capital inflows represented the most important transmission channel for spillovers post-GFC. Barroso et al (2016) find that US UMP has led in Brazil to substantial capital inflows, exchange rate appreciation, a stock market boom and credit growth. Among these propagation channels, they find that the impact of capital inflows is the only statistically significant channel throughout the analysis. Casual inspection confirms that total net capital inflows to EMEs post-GFC were indeed much larger than those recorded pre-GFC, despite the net banking outflows as global banks deleveraged (Graph 4).

Ratio of total foreign currency debt to GDP[1]

Graph 3

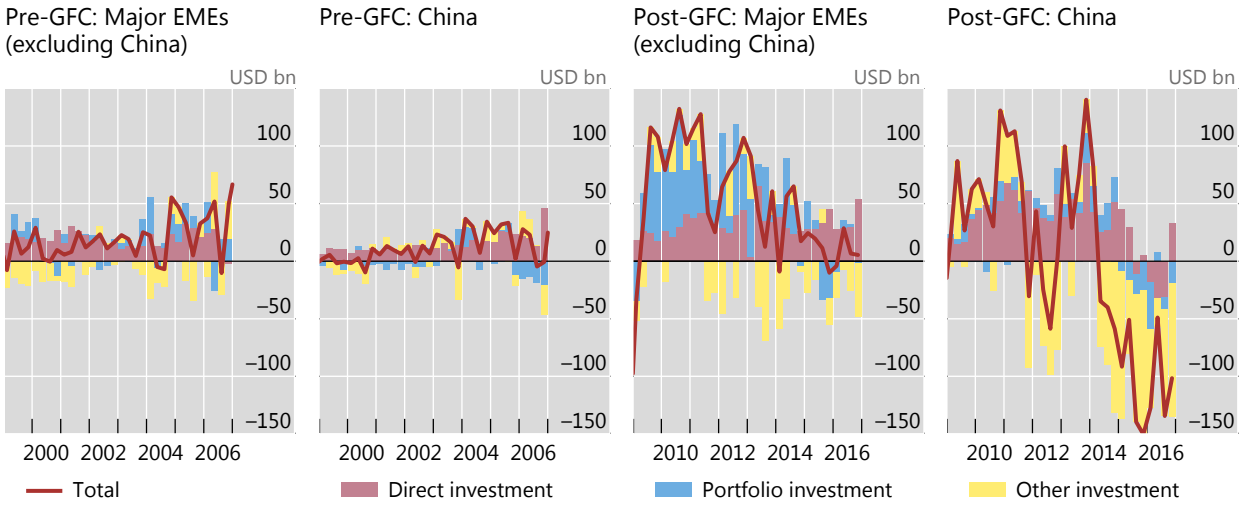


[1] Total foreign currency debt of non-bank residents of the respective economies; simple average across regions. End-of-year ratios.

Sources: National data; BIS debt securities statistics and locational banking statistics; BIS calculations.

Net capital flows to major EMEs before and after the GFC[1]

Graph 4

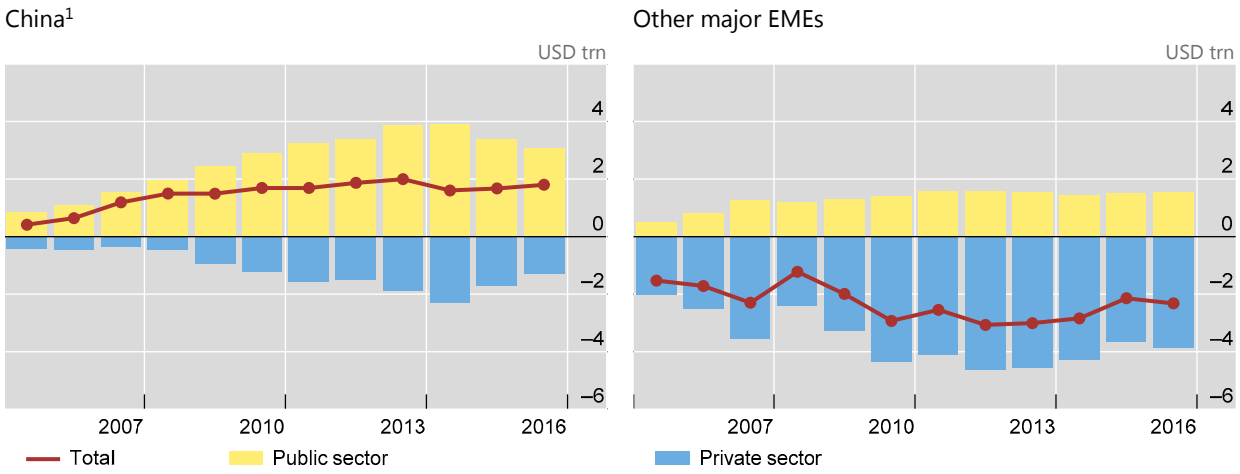


[1] Brazil, Chile, China, the Czech Republic, Hungary, India, Indonesia, Korea, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Thailand, Turkey and Venezuela. Pre-GFC data are compiled under the BPM5 standards and post-GFC data under BPM6.

Sources: IMF, *Balance of Payments Statistics*; State Administration of Foreign Exchange, China.

EME net international investment position

Graph 5



[1] For China, the net public international investment position is calculated as the difference between reserves and SDR allocations. [2] Brazil, Chile, Colombia, India, Indonesia, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Thailand and Turkey.

Source: IMF, *Balance of Payments Statistics*.

All in all, the combined effects of these transmission channels of monetary policy spillovers from AEs to EMEs have led to a sort of a paradox. At the same time it created "excessive exuberance" in the EMEs' equity and FX markets but it was not enough to continue sustaining the previous business cycle. In fact, some EMEs' economic fundamentals deteriorated and, for example, the private sector's external indebtedness, in particular, increased sharply despite (or because) of the (managed) floating exchange

rate regime.[6] Hence, EMEs were facing a difficult trade-off to ensure their financial stability. Tightening their monetary policy stance while AEs monetary policy (MP) stance was around the zero-lower-bound (ZLB) might simply expand investors' risk appetites and actually increase capital inflows. That would boost the local credit cycle further and threaten their financial stability. The unprecedented post-GFC capital inflows, as a percentage of GDP, have also challenged the effectiveness of foreign exchange interventions, CFM measures and all other policy tools deployed to smooth exchange rate volatility.

Therefore, the post-GFC UMP affected the public sector's good work of the late 1990s (including foreign exchange reserve accumulation and prudent fiscal management) (Graph 5) during the previous decade. The pragmatic policy framework that had served EMEs well up to the GFC appeared to be no longer capable of "putting the house in perfect order". That outcome to some extent confirms the thesis of Rey (2013, 2017), for example, who argues that adopting a flexible exchange rate regime is no longer sufficient as a means of gaining MP independence, and that the extra degree of freedom gained would not be sufficient to manage the impossible trinity. How then should EMEs' policy frameworks evolve?

3. EMEs towards an integrated inflation targeting framework[7]

The difficult post-GFC challenges facing EME policymakers are subsidiary to the much bigger issue of why the GFC happened to begin with. Nonetheless they revived, given the regulatory shortcomings that contributed to the crisis (Blinder (2013)), a pre-GFC fundamental policy debate, and brought it to the fore: can MP, focusing only on its own objectives, simultaneously deliver both price and financial stability? More broadly, should central banks concern themselves solely with macroeconomic stability (ie growth and inflation) or should they also worry about financial stability? And, if so, what single instrument can achieve both objectives?

Prior to the crisis, a dominant view was that MP under an IT regime, ie using a short-term policy rate to steer inflation towards a pre-committed target, was sufficient to stabilise inflation (and, simultaneously also activity and the macroeconomy). When financial stability is reduced to controlling "asset price movements", stabilising it with MP was seen as creating greater welfare losses than simply responding to inflation (eg Bernanke and Gertler (1999, 2001) and Bernanke et al (1999)). As a consequence, it was recommended under an IT regime to ignore financial stability as an independent policy goal for MP ex ante, using prudential tools if required to deal with financial problems ex-post (eg "mopping up" after crises). Others, however, argued in favour of reacting proactively to perceived financial vulnerabilities (eg Borio and White (2003) and Cecchetti et al (2002)) to reduce the probability and severity of financial crises. But the GFC challenged the capacity of an IT regime to limit financial imbalances. Relying solely on an MP stance that was successful in engineering the Great Moderation but ineffectual vis-à-vis the build-up of financial systemic risk called for some form of "leaning against the wind" (LAW).[8]

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[6] The post-GFC exuberance showed how markets seemed to be prone to herd behaviour and interpret any prolonged period of exchange rate appreciation as a definitive sign of a sea change in fundamentals that would warrant a new, more appreciated, equilibrium for the real exchange rate. No matter how many warnings were heard about the nature of a floating exchange rate (even a managed float), one-sided bets were predominant and turned out to be a threat to financial stability.

[7] This section draws on Pereira da Silva (2016b), which provides a fuller discussion of the IIT framework.

[8] Proponents of LAW by means of MP, such as Borio (2016) and Filardo and Rungcharoenkitkul (2016), show that financial imbalances today could potentially lead to even higher imbalances tomorrow. MP should, therefore, "lean" to control the build-up of vulnerabilities. But there are many ways to address this concern. For example, one important guiding indicator for the ECB was M3, which was also deemed to capture some elements of credit booms. While there was some complacency regarding the ability to monitor and regulate financial markets, the responsibility cannot be attributed exclusively to MP, but more to financial supervision and regulation. Yet, not all are convinced. Svensson (2015), for example, argues that the policy rate is too

While the debate continued about whether or not to LAW and with what instruments (eg MP or not MP), additional instruments – MaP tools – emerged out of our existing microprudential toolkit, as non-MP instruments that could do the job and usefully complement MP in tackling the objectives of macroeconomic (price) and financial stability.[9] Agénor and Pereira da Silva (2013) pointed out that financial imbalances might typically have a sectoral dimension (eg housing), which would require more specific tools, rather than the "generic" policy interest rate, to address these concerns. In practice, we ended up including some "new" tools such as countercyclical capital buffers and dynamic provisioning alongside the "old" tools such as reserve requirements, liquidity or leverage ratios, loan-to-value and debt-to-income ratios as part of our MaP toolkit. Table 1 provides a comprehensive typology of commonly used MaP instruments by type of risk or vulnerability and financial system component. Kuttner and Shim (2016) and Lim et al (2011, 2013) were among the first researchers to compile cross-country MaP data sets. Altunbas et al (2017), using the information contained in these earlier data sets to construct a data set consisting of 1,147 MaP actions taken in 64 countries between 1990 and 2014.[10] They find that there is a pattern of increasing use of MaPs during the post-GFC period.

Macroprudential instruments by vulnerability and financial system component — Table 1

		Financial system component				
		Individual bank or deposit-taker		Non-bank investor	Securities market	Financial infra-structure
		Balance sheet	Lending contract			
Vulnerability	Leverage	Capital ratio Risk weights Provisioning Profit distribution restrictions Credit growth cap	LTV cap Debt service/income cap Maturity cap Margin/haircut limit			
	Liquidity or market risk	Liquidity/reserve requirement FX lending restriction Currency mismatch limit Open FX position limit	Valuation rules (eg MMMFs)	LC or FX reserve require-ment	Central bank balance sheet operations	Exchange trading
	Interconnected-ness	Concentration limits Systemic capital surcharge Subsidiarisation				Central counter-parties (CCPs)

Source: CGFS (2010).

Cerruti et al (2017a, 2017b) and Claessens et al (2013) use a similar typology to that of Table 1 and classify MaPs according to their apparent goals. On this basis, there are five different instruments: (i) capital-based instruments (countercyclical capital requirements, leverage restrictions, general or dynamic provisioning) and (ii) liquidity-based requirements; these two are used for increasing the resilience of the

blunt an instrument to deal with asset price inflation and its costs (eg lower output and higher unemployment resulting from higher rates) outweigh its benefits (eg the lower probability of a future crisis).

[9] In principle, as suggested by Jan Tinbergen, the first winner of the Nobel Prize for economics, in 1969, the number of policy instruments should equal the number of objectives. When "the number n of targets surpasses the number n' of instruments it is equally clear that we are then placed before insoluble tasks" (Tinbergen (1952, Chapter 5)).

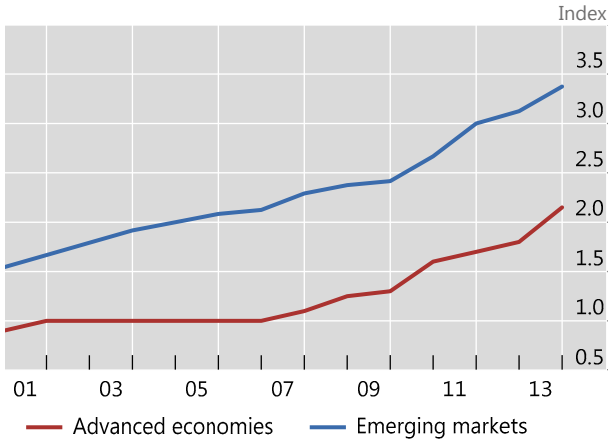
[10] In order to tackle the relative paucity of macroprudential data, the G20 in 2009 promoted the Data Gaps Initiative (IMF-FSB (2015); see also (Buch 2017)).

financial sector; (iii) asset-side instruments (credit growth limits, maximum debt service-to-income-ratio, limits to bank exposures to the housing sector such as the maximum loan-to-value ratio; (iv) changes in reserve requirements; and (v) currency instruments (variations in limits on foreign currency exchange mismatches and net open positions); and these are for increasing the resilience of the financial sector. These data confirm that both the AEs and EMEs have increased their reliance on a tightening of MaPs to dampen financial excesses since the GFC (Graph 6).

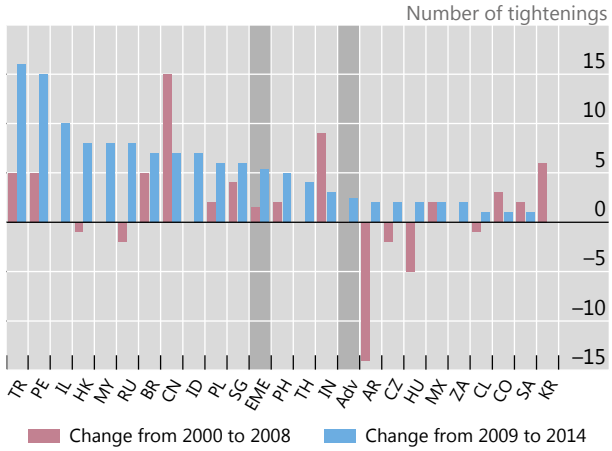
Trends in macroprudential instrument deployment

Graph 6

The number of instruments has been increasing[1]



Macroprudential instrument have been tightened more after the GFC[2]



[1] The index is a cumulative measure of 12 macroprudential instruments. Each instrument takes value 1 if it is utilised in a country and 0 otherwise. [2] A cumulative measure developed by Cerutti et al (2017a), using nine macroprudential instruments. Each instrument takes value 1 if tightened, –1 if loosened and 0 if there is no change. Shaded areas in the right-hand panel are the averages for EMEs and AEs.

Sources: Cerutti et al (2017a) and Cerutti et al (2017b).

The increasing use of MaPs raises questions about how they interact with MP. The new conventional wisdom borrows from Tinbergen's separation principle and acknowledges that MP should aim primarily for price stability and MaPs should aim to address financial distortions that may lead to a build-up of systemic risk. However, in a world where policies do not work perfectly in attaining their objectives, the interactions between them become important. Furthermore, it might be difficult to completely separate the roles of MaPs and MP in stabilising prices and reducing financial systemic risks. These might be intertwined. Moreover, Agénor et al (2014) argue that there are a number of conditions under which MaP and MP should be viewed as complements in achieving both macroeconomic and financial stability. In particular, when "sudden floods" of capital affect an EME, causing excessively rapid credit growth, a sharp rise in goods and asset prices, the textbook response of increasing interest rates to restrain credit growth and reduce inflationary pressures can be self-defeating. This course of action, by increasing interest rate differentials, could stimulate even greater capital inflows. There is a growing literature on this issue (see, for example, Agénor and Flamini (2017)). A timely and more aggressive use of FX interventions and MaPs as a complement to a well calibrated monetary policy response can help to manage capital flows, smooth asset price movements and reduce inflationary pressure in an economy subject to large external financial shocks.

Could this combination of MP and MaPs be the solution for the challenges that UMP and its spillovers pose to EMEs? The way forward is to explore further, with more analytical and empirical work, this key assumption of effectiveness and complementarity between MP and MaP. One direction for this effort is to use DSGE settings where both instruments are used and their effectiveness measured against

a metric of stability (Agénor and Pereira da Silva (2013)). The resulting type of policy framework can be labelled an "integrated inflation targeting" (IIT) framework. Under IIT, a central bank's inflation targeting mandate is extended to include a financial stability objective: the policy interest rate is set to respond directly to a (well defined) measure of excessively rapid credit expansion and MP and MaP tools are calibrated jointly to achieve macroeconomic (price) and financial stability. Naturally for an IIT framework to become operational, further research is needed. However, it could be argued that, de facto, some EMEs have implicitly implemented this type of response, even if we still need to enhance our understanding of its practical calibration. For example, to implement an IIT with some form of a "credit-augmented Taylor rule",[11] not only would MP have to react to the inflation gap (I) and the output gap (O), it would also need to respond to (some measure of) "financial (in)stability". But this "metric" – the one measuring financial stability – is a tricky one.[12] Proposed candidates include "financial cycle" indicators (Borio (2016)), composite indicators of components of credit cycles and asset prices, as well as a gauge of credit growth gap (C), defined as the difference between the actual private credit growth rate and its "reference" pace of expansion.

Operating an IIT regime, complemented with jointly calibrated MaP tools, addresses some but not all aspects of the build-up of financial systemic risk. Another set of instruments is also necessary for an IIT framework to prevent excessive exchange rate appreciation and volatility in upswings and episodes of massive capital inflows (Table 2, final column, marked in red). This is especially important given the strong links between EME currency appreciation against the dollar and private sector credit growth between 2007 and 2010 (Graph 7). However, exchange rate intervention does not mean going back to a fixed or pegged regime, ie to set (explicitly or implicitly) any specific exchange rate target. In fact, a floating rate should still be the first line of defence, and specific foreign exchange interventions, imposing taxes on short-term foreign exchange inflows, varying required reserve requirements and provisioning for foreign exchange loans, and introducing currency-based MaPs, such as setting limits on currency mismatches and net open positions (Altunbas et al (2017)), should be considered as a supporting act.

The evolution from an IT towards an IIT framework — Table 2

Institutional location	Macroeconomic issue	IT(1): Flexible inflation targeting (before GFC)	IT(2): Flexible inflation targeting (during GFC)	IIT: Integrated inflation targeting (after GFC)
Monetary Policy Committee	Inflation gap (I) Output gap (O)	Taylor-type rule on I and O	Taylor-type rule on I, O with FX smoothing factor	Augmented new CB rule on I, O and carefully defined C
Financial Stability Committee or Authority	Credit gap (C) to be carefully defined	Microprudential tools (MiP) enough to ensure financial stability	Tinbergen separation; MP + Micro & macro prudential tools (MiP + MaP)	Timely coordinated – jointly calibrated micro & macroprudential tools (MiP + MaP)
Forex intervention by CB or specific entity	Exchange rate volatility (FX vol)	Pure floating with (some) FX interventions	Administered floating with (regular) FX interventions	Administered floating with smoothing FX interventions & if/when needed capital flow management (CFM)

Source: Agénor and Pereira da Silva (2013).

[11] Or a "financial imbalance indicator-augmented" Taylor rule to be more generic. However, monetary policy is (basically) nowhere conducted on the basis of strict and mechanical rules. Calibration of interest rate changes is very subtle and requires judgment.

[12] And we need to remember that IT relies on accurately estimating "natural" levels to deviate from and possibly react to. So, dealing with uncertainties in this process would not necessarily be new.

Indeed, as financial stability has become a more important motive for FX intervention, many EME central banks have adjusted the choice of instruments and intervention tactics (see Ghosh et al (2017), Garcia et al (2017)). In doing so, the boundary between an FX intervention policy that aims at influencing the exchange rate and other similar operations that aim at providing or shrinking market liquidity conditions has become blurred. Table 3 summarises the commonly used instruments in EME central banks' FX intervention and their potential effects.

As mentioned above, a well calibrated and fully tested IIT framework will need time to develop and, even if some aspects of an IIT have been deployed, it is too early to assess its full efficiency. More time will be needed before one can conclude whether it is sufficient to handle all the post-GFC crisis policy challenges. To sum it up: due to the increased severity of the GFC's spillovers (eg large capital inflows due to QE by the FED and the ECB), in part due mainly to greater financial integration, the early verdict for an IIT framework is somewhat promising. There is growing evidence that a combination of MP, MaPs and foreign exchange interventions have helped to stabilise the macroeconomy and dampen financial exuberance (eg Borio (2016), Agénor and Pereira da Silva (2013) and Cerutti et al (2017a)).

Instruments used for FX intervention — Table 3

Instrument	Mechanism	Effects			Examples
		Provide hedge for FX exposure	Support FX market liquidity	Economise on use of FX reserves	
FX spot transaction	Central bank sells FX spot	Yes	Yes	No	
FX swap or FX repo	Central bank sells FX spot and purchases FX forward	Yes, against market risk or FX maturity mismatch	Possibly	Yes; only temporary supply of FX	Korea (FX swap), Brazil and Russia (FX repo)
Currency forward (non-deliverable, settled in local currency)[1]	Central bank pays domestic currency related to change in FX value	Domestic currency payment offsetting FX valuation losses	Possibly, if FX demand declines	Yes; no foreign currency payment	Brazil, Peru
FX index certificate	Central bank pays domestic currency equivalent of change in FX value	Domestic currency payment offsetting FX valuation losses	Possibly, if FX demand declines	Yes; no foreign currency payment	Peru
FX options	Central bank sells options to buy FX from its reserves if local currency exceeds threshold	Yes	Yes, supplies liquidity when demand for FX increases	Yes, partly. FX reserves sold only when market initiates purchases (ie options are exercised)	Colombia

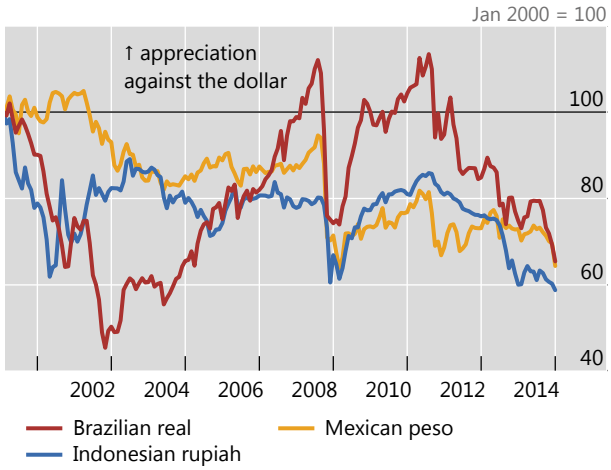
[1] Referred to as the swap cambial (currency or FX swap) in Brazil.

Source: Domanski et al (2016).

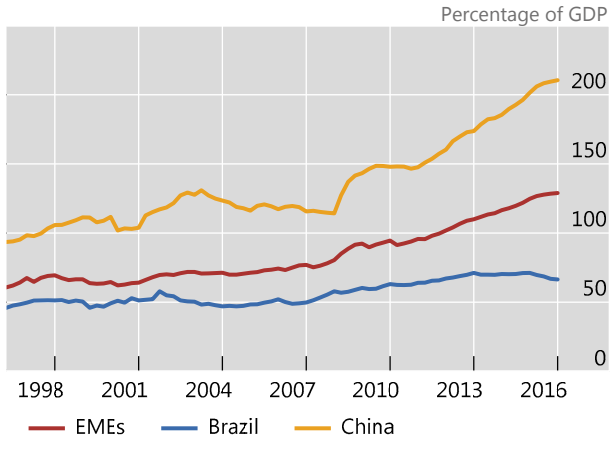
EME dollar exchange rates and credit to the private non-financial sector

Graph 7

Bilateral dollar exchange rates



Total credit to the private non-financial sector[1]



[1] EME aggregate comprises Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Poland, Russia, Saudi Arabia, Singapore, South Africa, Thailand and Turkey, The percentages of GDP are calculated based on conversion to US dollars at market and at purchasing power parity (PPP) exchange rates.

Sources: Thomson Datastream; BIS calculations.

But there are risks and controversies too. What if the type of IIT-like framework used by EMEs does not live up to its promise of restoring "order in the house"?, Then, it is likely that EMEs will be tempted to impose additional capital controls as a last resort against a flood of capital inflows. Note that capital controls on inflows are not new. In 1991, the Central Bank of Chile imposed a one-year unremunerated reserve requirement (URR) on foreign loans in an attempt to discourage short-term borrowing without affecting long-term investments as well as to avoid overheating of the economy. Between 1991 and 1998, the URR rate was increased to as much as 30% and its coverage extended to non-debt flows, including American Depositary Receipts (IMF (1998, Annex IV)). But the unprecedented scale of capital inflows since the GFC has prompted some EMEs to introduce more measures to limit capital inflows, including outright taxation on capital inflows, special reserves requirements on foreign purchases of local securities and maximum limits on banks' FX derivative contracts. Ghosh and Qureshi (2016) provide a summary of such capital control measures introduced by selected EMEs to limit capital inflows post-GFC (Table 4).

Recently, the IMF gave a "qualified" endorsement of the use of capital controls[13] but only under some special circumstances, namely, when three conditions are met (IMF (2016b)): the exchange rate is assessed to be overvalued, reserves are judged to be adequate and the economy is overheating, and EMEs have reduced policy flexibility (see Graph 8, the intersection of all three circles). Hence, in such cases, introducing CFMs can be a useful support, but they should not substitute for necessary macroeconomic adjustments whilst safeguarding against destabilising financial shocks. The IMF adds that CFMs should be targeted, transparent and generally temporary – being lifted once the strong capital inflows abate, in the light of their costs, such as being seen by global investors as anti-foreign direct investment and thus deterring foreign capital support for viable local projects.

[13] The IMF has developed two frameworks as sources of advice on MaPs and CFMs to ensure consistency and adequacy according to country circumstances. The central message of the frameworks is to avoid using capital controls as a substitute for necessary macroeconomic adjustment.

Measures to limit capital inflows in selected EMEs

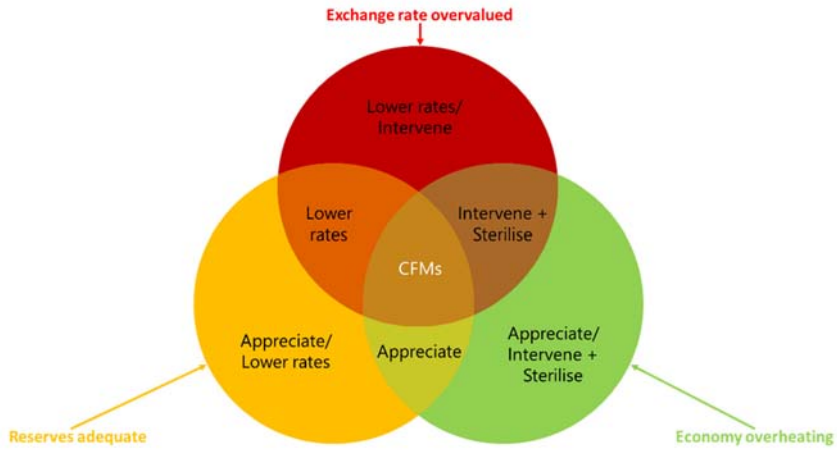
Table 4

Country	Year	Measures
Brazil	2009–12	Tax of 2% levied on foreign portfolio equity and fixed income inflows in October 2009. The tax rate was gradually raised to 6%, and extended to cover other sources of foreign flows such as the issuance of depository receipts into local equities; borrowing abroad with maturities of less than one year (later tightened to maturities of less than two, three, and five years); and notional amount of FX derivatives. URR of 60% on banks' gross FX positions beyond $3 bn (later tightened to $1 bn) was also levied.
Costa Rica	2014	Activated for a period of up to six months an increase in the income tax rate (from 8% to 33%) on interest earned on investments in fixed income assets issued by private sector entities to non-residents; and established URR for new investments in these financial instruments.
Indonesia	2010–11	Imposition of a one-month minimum holding period on central bank bonds for all investors; limit on the daily balance of banks' short-term external debt to 30% of capital; reserve requirement on deposit accounts in foreign exchange raised from 1% to 5%.
Korea	2010–11	The maximum limits on banks' FX derivative contracts set at 50% (domestic banks) and 250% (foreign bank branches) of bank capital in the previous month. Restoration of a 14% withholding tax on interest income on non-resident purchases of treasury and monetary stabilisation bonds.
Peru	2010–11	Extended a 60% reserve requirement for new foreign holders of debt with maturity up to three years. Extended the income tax rate of 30% to all non-resident gains on financial derivatives transactions.
Thailand	2010	Restoration of a 15% withholding tax on non-residents' interest earnings and capital gains on new purchases of government bonds.
Uruguay	2012	Reserve requirement of 40% (later raised to 50%) introduced on new foreign purchases of central bank notes and central government securities.

Source: Ghosh and Qureshi (2016).

Managing large capital inflows

Graph 8



Source: IMF (2016b).

4. Can a combination of IIT, with its countercyclical MaPs, and FX interventions plus CFMs be sufficient to reduce financial volatility in EMEs?

The old and new tools comprising IIT such as MaPs, FX interventions and CFMs being deployed by EME central banks have not been able to fully neutralise the collateral effect of UMPs on EMEs' domestic financial markets. EME assets such as stocks and government bonds, as well as EME currencies, have been trading in a wide and volatile range. El-Erian (2015) attributes these pronounced price movements to a tug-of-war between central banks and the markets.[14] On the one hand, AE central banks seek to suppress volatility in key asset markets, as prolonged volatility is deemed to undermine the purpose of UMPs. On the other hand, with term premia compressed in the euro area and the United States, and ultra-low policy rates, any shifts in market sentiment, the growth outlook and inflation expectations are prone to causing outsized market reactions, as many asset prices have reached levels that are no longer warranted by fundamentals.

This tug-of-war has itself evolved. More recently, skilful communication on UMP has managed to significantly dampen volatility in AEs' financial markets, achieving a somehow paradoxical combination of low volatility with high policy uncertainty going forward. However, for many EME bond markets, the lack of financial depth makes their situation different. That shallowness contributes to the much larger price movements observed in EMEs. Traditionally, long-term bonds are mostly held by banks or state-run pension funds in EMEs. As a result, the intrinsic liquidity of the markets for many EME bonds is rather low. When global investors were encouraged by UMPs to take greater risks, some diversified their portfolio into EME bonds, but neglected the low liquidity that characterises these markets. However, at any hint that the global liquidity conditions were about to tighten, these investors often reacted more quickly to asset price declines than they would to asset price increases.[15] Consequently, currency volatility features more prominently in a time of capital outflows than it does during capital inflows (Turner (2015) and Ramos-Francia and García-Verdú (2015)).

One of the major reasons why this vast array of interventions is somewhat less effective in practice than in analytical models has to do with a political economy argument. When EME borrowers get used to easy money and credit, everyone's mindset is affected, encouraging the adoption of what might be called "credit" populism. Easy global money amplifies expansion beyond what models might find appropriate or optimal. But expansion, albeit imprudent, might well serve the purposes of EME and AE local political cycles. In fact, "credit populism" is an equal opportunity menace that we have seen across Europe, Asia and America. In this light, it becomes more challenging to slow down an expansionary business cycle sooner than envisaged if the "party gets too wild too soon". In any event, this "feel-good" mindset further complicates domestic political economy conditions (which are usually already complex enough, even without the easy money). It hampers policymakers' capacity to slow the "party" down on time with the proper set of policy instruments. The constraints imposed by political cycles affect all countries, AEs and EMEs alike and, although they are not a "new" post-GFC challenge, they have been magnified by recent ultra-accommodative financial conditions.

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[14] Mohamed El-Erian introduced this notion of markets as caught in a tug-of-war in early 2014 and has since followed up on this theme with numerous articles in various financial press and social media.

[15] The growing importance and concentration of asset managers have accentuated such dynamics. In the post-GFC world, the forced deleveraging of global banks and insurers means that investment funds have become the main buyer of new debt issues. Importantly, the asset management industry has become highly concentrated, with the top 10 asset managers accounting for just under 30% of the sector's total assets under management (Haldane (2014)). And a large amount of assets concentrated in the hands of a few "star" managers means that strong redemptions in one of an asset manager's funds could spread quickly across funds for that particular asset manager (IMF (2014)). Moreover, there is evidence that less liquid bond funds tend to hoard more cash in response to redemptions, and that these funds typically exacerbate bond sales during market turbulence by adding extra discretionary sales to the redemption-driven sales (Shek et al (2015)).

This situation is what has been described as the "financial trilemma" and constitutes an appealing case for macroprudential policy coordination. Claessens et al (2010, Chapter 2), Schoenmaker (2011), and Obstfeld (2015) referred to the "financial trilemma" as a situation where financial integration with global markets (involving no CFMs), local/national control over MaPs through financial regulation, and financial stability, are not attainable simultaneously: a jurisdiction can attain any two of these objectives: financial stability and international integration, financial stability and independently pursued financial policy making, or international integration and autonomous financial regulatory policies, but not all three objectives simultaneously.

The financial trilemma has a clear implication: if countries want domestic financial stability and an independent financial policy simultaneously – it will be impossible to achieve internationally linked financial markets. The attainment of financial stability at home and independent regulation could only be possible under some form of financial protectionism. This may also lead to a race to the bottom, with countries increasingly resorting to unilateral capital controls (as discussed by Blanchard (2017)), or "regulatory wars'' could break out, as argued earlier.

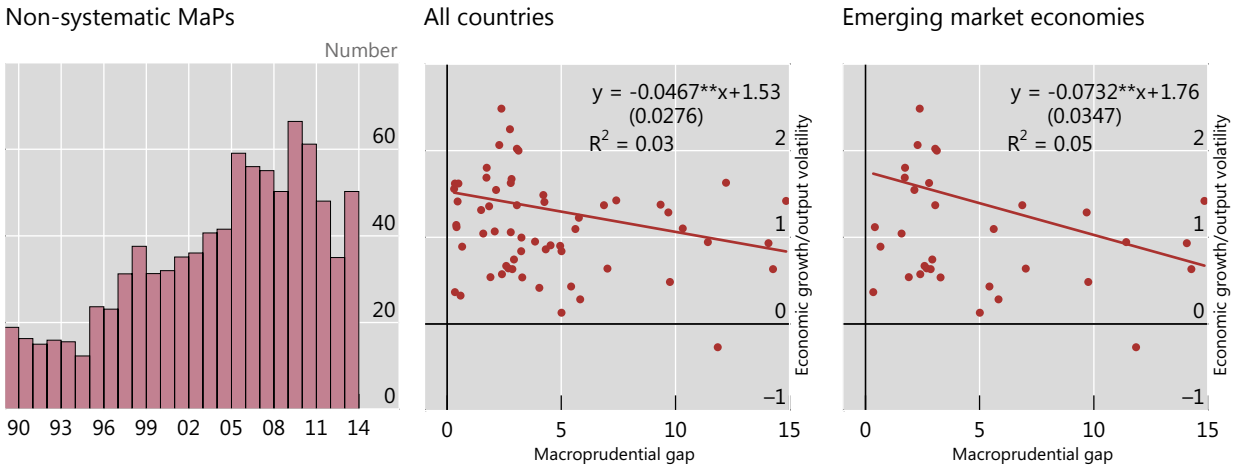
5. One step further: international coordination of macroprudential policies as an alternative to CFMs

We have gone rapidly through the evolution of EME policy frameworks as a "learning" process. After the GFC, facing excessive capital inflows, EME policymakers have been using an array of tools to dampen the spillovers of the global financial cycle into their jurisdictions. But the duration and intensity of the episodes of inflows challenged existing and/or new MaPs introduced to dampen financial excesses. We also have little or no experience with some of these new MaP tools, for example with the countercyclical capital buffer (CCB). But in doing so, there is a potential risk that a MaP in one country could have a negative externality on another. In aggregate, that could lead to the suboptimal growth of global credit. Moreover, the growing use of CFM measures could curtail international direct investment flows and suppress innovation, thereby affecting global growth.

As mentioned above, and in line with EMEs' lessons learned during and after crises, Boar et al (2017) find that actual MaPs are, as expected, tightened when key indicators of financial excesses go up (eg growth rates of credit-to-GDP and net capital inflows, particularly in deviation from their past trends). They distinguish the usage of MaPs between "systematic" and "non-systematic" (or unpredictable) basis. A "non-systematic" usage of MaPs refers to implementing them without a systematic link to economic fundamentals. They observe that there is an increase of non-systematic MaPs over time (Graph 9, left-hand panel). Then, they construct a measure of the "macroprudential gap" as the cumulative sum of non-systematic macroprudential policy actions over a certain period of time. What is interesting is that there is a negative correlation between the usage of MaPs on an "ad hoc" or "non-systematic" way and macroeconomic performance and, in particular, growth (Graph 9, centre and right-hand panels). That said, this analysis shows also that the use of MaPs, overall, is positively related to economic growth and negatively related to growth volatility. In other words "good" MaPs contribute to economic well being, while "bad" MaPs could reduce growth.

Macroprudential gap and economic performance

Graph 9



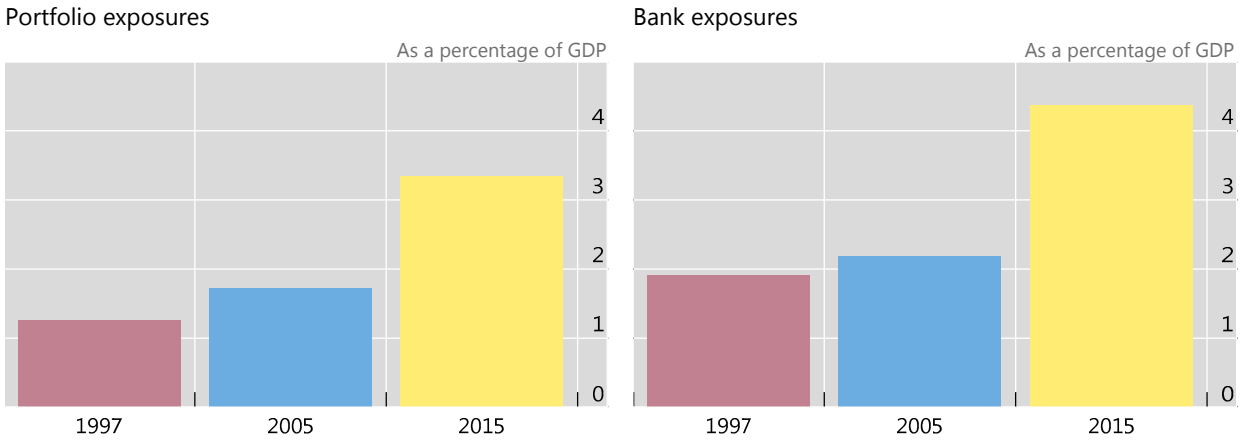
Source: Boar et al (2017).

Against this backdrop, the international coordination of MaPs could improve their effectiveness, by reducing their unsystematic component, and enhancing the global response to financial volatility. Policymakers and academics have long recognised the importance of international policy coordination. Back in the 1970s and the 1980s, the G7 countries conducted coordinated intervention in the foreign exchange markets, liquidity provision through central bank swap lines and specific commercial sanctions. Research on similar topics dates back to Hamada (1976), Canzoneri and Gray (1985) and, more recently, Frankel (2016). But during the Great Moderation in the 1980s and 1990s, each major central bank in a flexible exchange rate system followed a monetary policy rule which was optimal for its own country's price stability and output stability. Individually, they all experienced what Mervyn King (2003) called a "NICE" (non-inflationary, consistently expansionary) period. And collectively, as described by John Taylor (2013), the international monetary system was operating near an internationally cooperative equilibrium (another NICE). Accordingly, attempts to formally coordinate policy choices across countries would likely have added little to this double-NICE world.

But the response to the GFC has changed all that, and the collateral effects of some policies in our international financial system have become "nastier", (ie more capable of generating financial instability and crises). That has an important bearing on international policy coordination. From the perspective of the EMEs, AEs' UMPs have produced large negative externalities (or spillovers) for the global economy (eg Rajan (2014)). From the perspective of the AEs, their banking and portfolio exposures to EMEs have increased sharply over the past decade and would have done so due to increased integration, regardless of the GFC (Graph 10). These large exposures imply that volatility in EME financial markets could also spill back to the AEs. The IMF (2016a) finds that more than a third of the variation in AEs' equity and foreign exchange returns and more than 40% of the variation in EMEs' equity and foreign exchange returns are attributable to spillovers from EMEs (Graph 11).

Financial exposures of AEs to selected EMEs[1]

Graph 10

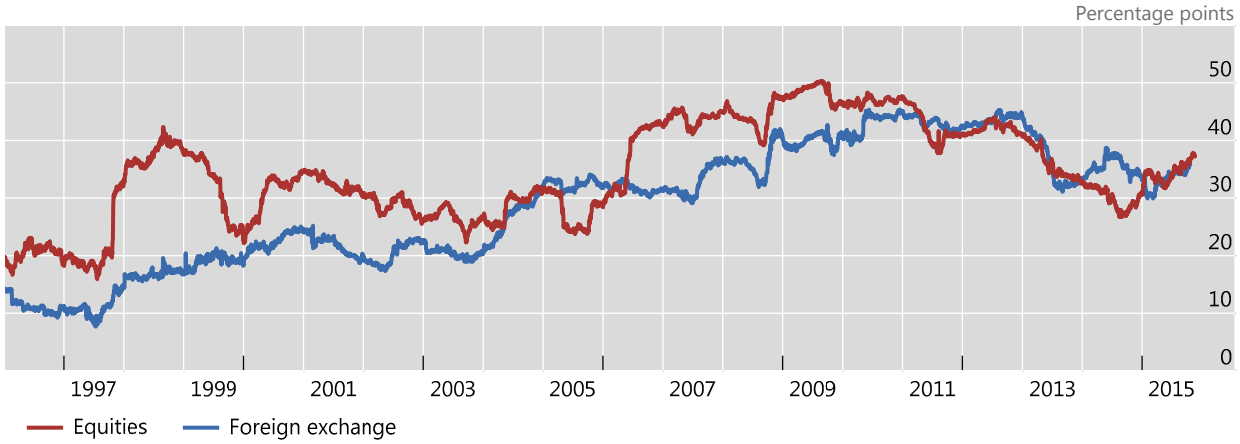


[1] The group of selected AEs includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States. The group of selected EMEs includes Brazil, China, India, Indonesia, Mexico, Russia, South Africa and Turkey.

Sources: IMF, *Coordinated Portfolio Investment Survey*; BIS consolidated international banking statistics; BIS calculations.

Spillover indices from EMEs to an average AE[1]

Graph 11



[1] Average spillovers to advanced economies were obtained by scaling spillovers by the number of advanced economies. Financial market spillovers are defined as the fraction of the 12-day-ahead forecast error variance of a country's local currency nominal equity return that can be accounted for by innovations in another country's equity return.

Source: IMF (2016a).

In the light of the observed spillovers and spillbacks, there has been a progressive evolution in the argument for some form of international cooperation. In particular, given the sheer size and outreach of many global banks, new regulations applied to banks in one jurisdiction will not only dampen any local credit boom, but also affect the credit conditions in other economies where the same banks have a large presence. In this context, some form of coordination of MPs and/or MaPs between AEs and EMEs could help moderate excessive co-movements of asset prices globally, and reduce the chance that any individual country will rush to capital controls as a last resort to restore financial stability (see, for example, Cecchetti

and Tucker (2016)).[16] Along the same lines, Jeanne (2014) analyses the case for international coordination of MaPs in a model where both domestic MaPs and prudential capital controls have international spillovers through their impact on capital flows. The uncoordinated use of MaPs may lead to a "capital war".

Progress in recognising the mutual benefits of international coordination on MaPs has been accompanied by new research. For example, Agénor et al (2017) use a two-country, core-periphery, EME-AE, dynamic stochastic general equilibrium (DSGE) model to study the effects of coordinated and non-coordinated MaP policies when there is financial dependency of EME banks, and financial intermediation is subject to frictions. The exercise finds that the policy prescriptions under international policy coordination are quite different from those emerging from self-oriented policy decisions. In particular, optimal MaP policies, in the short run, must be adjusted to mitigate the adverse consequences of the financial accelerator, and its cross-country spillovers. The gains from cooperation appear to be sizeable. Nevertheless, their magnitude could be asymmetric, the gains of the peripheral EME being much larger than those accruing to the core AE. That confirms perhaps the intuition of some AE policymakers and could explain why there is still limited willingness to consider cooperation. It suggests potential political economy obstacles to the implementation of cooperative MaPs.

Nevertheless, there are also signs that pragmatism is a two-way street, as seen in recent developments, especially drawing on the lessons from the taper tantrum. The Federal Reserve has skilfully improved its communications with market participants about potential international spillovers. For example, at the press conference following the 2015 June FOMC meeting, Chair Yellen told reporters:

> "*With respect to international spillovers, this is something that we have been long attentive to. Obviously, we have to put in place a policy that is appropriate to evolving conditions in the US economy, but we can't promise that there will not be volatility when we make a decision to raise rates. What we can do is to do our very best to communicate clearly about our policy and our expectations to avoid any type of needless misunderstanding of our policy that could create volatility in the market and potential spillovers as well to emerging markets, and I have been trying to do that now for some time. I've been doing my best to make good on that pledge.*"

More recently, Brainard (2017) discusses how various approaches to balance sheet normalisation could affect the composition of US demand, net exports, the exchange rate and foreign output. Perhaps reflecting the new style of communication, markets responded differently to the 2017 June FOMC[17] than they did to the announcement of the taper tantrum (see Graph 12). By acknowledging the concern about international spillovers and the need to mitigate them, the US Federal Reserve appears to have been successful in reducing cross-border transmission of volatility between these two episodes.

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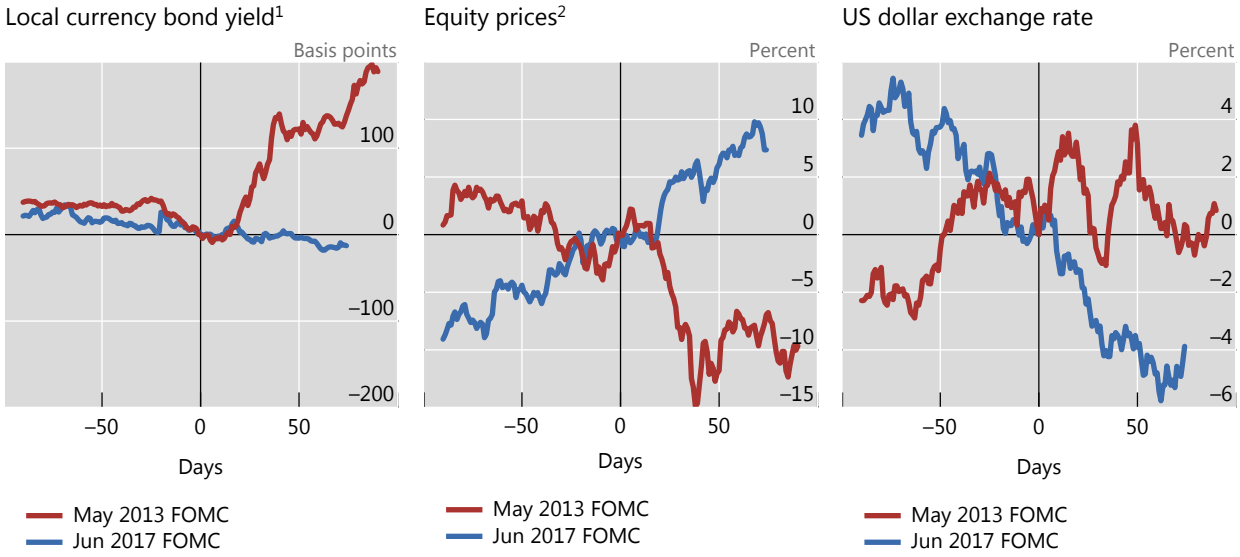
[16] Claessens et al (2010) argue that national regulators focusing on addressing the effects of a global financial institution failure within their national perimeter would tend to ignore the associated negative international spillovers. They suggest that improved international coordination of regulation and supervision would be a good starting point for addressing these externalities.

[17] To the statement that the Fed will begin considering the reduction of its balance sheet towards the end of 2017.

Cumulative changes in EME bond yield, EME equity price, and US dollar index — Graph 12



[1] Simple average of five-year government bond yields of Brazil, India, Indonesia, Malaysia, Mexico, the Philippines, Poland, South Africa and Turkey. [2] MSCI EM free index. [3] ICE dollar index (DXY).

Sources: Bloomberg; Thomson Reuters Eikon.

Conclusions: avoiding "regulatory wars" using international coordination of MaPs

Following past lessons, the GFC triggered further adaptations in EMEs' policy framework to simultaneously achieve macroeconomic and financial stability. The pragmatic policy framework that served the EMEs well after the Asian financial crisis has evolved. But even an integrated inflation targeting framework, complemented with MaPs and FX interventions to smooth excessive exchange rate movements, has appeared insufficient to insulate EMEs from the large financial spillovers due to UMP.

So what changed with the GFC? The revival of calls for international cooperation has re-emerged mostly with the observation that the post-GFC unconventional policies pursued by both advanced and emerging market economies produce significant spillovers and spillbacks despite floating exchange rate regimes, restrictions on capital movements and successful experience with inflation targeting monetary policy regimes.

The most noted cross-border externalities (spillovers and spillbacks) that were the subject of mutual complaints inside the G20 circle consisted of "currency wars", or the old competitive depreciation beggar-thy-neighbour practice. That practice was, under current floating ER regimes, associated with central banks' massive asset purchase programmes. A related complaint was that, by deviating excessively from rules-based policy (Taylor (2013)), specific major central banks created incentives for others to also deviate from such policies and thus influenced their yield curves and hence the price of domestic assets including their exchange rates. But a number of other externalities were identified and debated. These included, but were not limited to, the effect of interest rate differentials on local credit cycles, the lack of fiscal coordination in the implementation/design of stimulus that affects risk premia (eg especially in the euro zone), the importance of forward guidance on central bank policies that reverberated on asset prices during the taper tantrum episodes) etc. Under these special circumstances of UMP, EMEs began considering and increasingly using MaPs and CFMs as a useful support against destabilising excessive capital inflows, exchange rate appreciation and imported financial exuberance. But in addition to the potential welfare costs associated with CFMs, the non-coordinated, non-systematic usage of MaPs also

began showing potential negative externalities. Left unchecked, the non-coordinated usage of MaPs could be seen as the start of a potential "regulatory war" between countries.

Therefore, it seems that we stand at an important juncture in the post-GFC era. There is a realistic assessment that concrete international monetary policy coordination – albeit desirable – is in practice far from becoming a reality. Yet, while monetary policy coordination is out of reach, we also know that globalised financing will continue to allow movements of capital flows to affect global and local asset prices including the exchange rate, in spite of (or even because of) policy interventions in both AEs and EMEs. We also know that both monetary and macroprudential policies affect financial stability. An extensive literature shows that there are strong policy spillovers between MP and MaP. In a nutshell, if we know MP and MaP need coordination inside a country, and if we also know that MaPs and MPs produce negative international externalities, then logically MaPs also need some form of international coordination. Furthermore MaP coordination could be confronted with fewer political-economy constraints than MP, in the light of the globalisation of finance. The current challenge is to try to avoid negative externalities resulting in "regulatory wars" by coordinating MaPs internationally. Not only could such an international coordination help EMEs to cope with large spillovers, but AEs could also benefit from reduced spillbacks from EMEs. This would constitute an undeniable win-win for the global economy.

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