"Sudden floods" and sudden stops of capital flows in an environment of ultra-low interest rates: an equal opportunity menace for emerging market and advanced economies alike

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1. Introduction – an old story: crisis management of capital flows in EMEs

Emerging market economies (EMEs) learned painfully from their own crises, especially in the 1990s, that although they could manage some temporary deviations from the strict trilemma of the impossible trinity,[2] any persistent attempt to depart from it could have negative consequences for the market value of their assets. It would be read by markets as eventually inconsistent, and country exposures would be reduced and traded against at some point in time. Most, if not all, typical EME crises have been the result of a market realisation of this inconsistency, accentuating internal imbalances which ironically had sometimes been created by a market-generated euphoria or boom based on a temporary perception that "this time is (was) different".[3] Capital inflows – without necessarily being a direct cause – were, and still are, often a compounding factor to this "irrational exuberance".

As a consequence, after many crises (eg the tequila, Asian, Russian and Brazilian crises), most pragmatic EMEs adopted the current dominant macroeconomic policy framework[4, 5] of a (relatively) floating exchange rate (ER) regime, a (relatively) sustainable fiscal-public debt stance and a (relatively) open investment capital account in order to ensure room for manoeuvre to conduct a (relatively) independent monetary policy (more recently under some form of inflation targeting regime even if modified from its initial design). That then turned out to become the preferred policy regime to help

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[2] The Mundell-Fleming small open economy extension of the IS-LM model has been used to argue that an economy cannot simultaneously maintain a fixed exchange rate, free capital movement and an independent monetary policy, a feature usually labelled the "impossible trinity," or the "Mundell-Fleming trilemma". See R Mundell (1963). "Capital mobility and stabilization policy under fixed and flexible exchange rates", *Canadian Journal of Economic and Political Science*, vol 29, no 4, 1963, pp 475–85: and J Fleming, "Domestic financial policies under fixed and floating exchange rates", *IMF Staff Papers*, vol 9, 1962, pp 369–79.

[3] It *never* is, as documented by K Rogoff and C Reinhart, *This time is different*, Princeton University Press, 2009.

[4] See J Frankel, "Monetary policy in emerging markets", *Handbook of Monetary Economics*, vol 3B, 2011, pp 1439–520.

[5] See F Mishkin, *Monetary policy strategy*, 2007, eg Chapter 17, "The dangers of exchange rate pegging in emerging market countries", pp 445–63.

promote locally more sustainable growth and development, including with increased social inclusion and redistributive policies.

Naturally, this policy consensus was reinforced by other common sense conclusions: the local financial system needs to be well capitalised, strongly regulated and supervised to hold enough provisions and liquidity to withstand even unusual shocks. And finally, on top of adopting a floating ER as a first line of defence, crises taught the importance of keeping enough FX reserves to smooth volatility and to have a usable buffer before relying on short-term liquidity provision by bilateral and/or multilateral sources.

Therefore, policymaking focused to a great extent on how to achieve some degree of freedom within some acceptable "grey area" boundaries of the impossible trinity without undermining macroeconomic and financial stability at home. But this was not, and still is not, easy. Why? Because most if not all typical political economy features in EMEs are prone to generating excess aggregate domestic demand coming from a range of pressures. It could be enduring income inequality that well intentioned politicians want to reduce, "white elephant" pet projects or dysfunctional politics that exacerbate the "tragedy of the commons" with weak fiscal rules. Whatever the source, the pressure usually transmits and leads to more volatility and excessive fiscal spending. And moreover, most local political economy cycles in EMEs can accommodate this additional spending in the form of additional public debt or moderate inflation or both, with more volatility but without necessarily leading to an immediate overt crisis. Many EMEs can still attract enough foreign savings with an open capital account and by promoting the usual signs of financial and monetary credibility, eg a manageable exchange rate regime and an effort to keep macroeconomic fundamentals in line with sovereign rating agencies' comfort zones (eg on growth, inflation and public debt) and the perceived dynamics of fundamentals. The history of EME crises in the last three decades always revolves around something going wrong within this "fragile policy regime". A classical stylised set of such episodes during the 1980s was termed "macroeconomic populism".[6] The more fundamental issue, however, is to what extent even a pragmatic policy regime with its managed floating exchange rate can guarantee complete insulation of domestic financial conditions in an environment of free capital flows.[7]

In these remarks I want briefly touch upon three perhaps novel angles to this old story.

2. A new story: the risk-taking channel and the mismanagement of capital flows in advanced economies (AEs)

The new issue in the 2000s is the "déjà vu" aspect of these features, many of which were familiar to EMEs but now apply to crises in AEs. As in EMEs, in AEs (eg Europe, Japan and the United States) many local political economy features leaned towards policies that expanded fiscal outlays, including as contingent liabilities, and used credit extension to households beyond prudent levels in order to improve the perception about social welfare, develop larger housing markets and accommodate conflicting demands over the budget and funding resources. Despite, of course, significant differences between EMEs and AEs in governance, institutions and income per capita, from a broad perspective there are some resemblances. For instance, what happened in the euro zone between core and periphery (ie financial exuberance enhanced by large flows of intra-euro zone bank credit in the wake of convergence to the euro, abandoning self-imposed fiscal thresholds and debt ceilings) resembled EMEs' pre-crisis policy mistakes.

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[6] See R Dornbusch and S Edwards (eds), *The macroeconomics of populism in Latin America*, University of Chicago Press, 1991.

[7] See H Rey, "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, August 2013, pp 285–333.

In many other AEs including the US, quasi-fiscal guarantees for the housing sector to enhance social inclusion also sounded familiar to EMEs. But there are some interesting new features coming from a new line of work. Large and volatile capital flows not only pose a headache to EME central banks but are also an issue for AEs (take Switzerland as an example). "Sudden floods" and sudden stops were also an important element of the euro area debt crisis, only that central banks there had far fewer tools to deal with this problem than those in Asia or other EMEs.

One way of looking at AE policies that eventually led to the Global Financial Crisis (GFC) is the "risk-taking channel"[8] in which large surges in lending in instruments denominated in reserve currencies (euro/dollar) to other smaller AE banks, specific sectors, corporates or governments grow, bypass existing prudential regulation and develop into credit and/or asset booms, leading to further currency appreciation, sovereign yield compression and other typical features of such episodes. And we are quite familiar with the transmission mechanism and the dynamics of how excessively rapid credit growth, buoyant economic activity and more permissive financial conditions facilitate the build-up of financial vulnerabilities.[9]

The perhaps more novel aspect of the risk-taking channel[10] in the context of low interest rates is that it can be exacerbated by cross-border bank capital flows and favour "lower" and/or "benign neglect" risk perception about AEs' sovereign debt and other monetary/financial indicators. That, in turn, can allow more lending space for large global banks and increase leverage and risk-taking. Another novel aspect is that the relevant exchange rate for the risk-taking channel is that of a funding currency – the US dollar or euro – whose movements might accelerate local currency appreciation not necessarily related to the traditional real sector and current account indicators.

Hence, financial exuberance and low yields do not necessarily come from a savings glut due to excess Asian savings that explains the Greenspan conundrum. The source might be excess round trips of short-term financial flows[11] from, say, large European global banks that provide "long-term" funding for the US high-yield market as well as other financial institutions' balance sheets that ultimately were full of highly complex and toxic, subprime-related, financial assets. One illustration of that novel aspect of the risk-taking channel is that, contrary to what many economists predicted, the post-Lehman period of the GFC saw an appreciation of the US dollar resulting from higher demand from those needing to quickly repay their round trips faster than expected. We know well how this story ends: it's the GFC of 2007 and counting.

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[8] See C Borio and H Zhu, "Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism", *BIS Working Papers*, no 268, 2008; and V Bruno and H S Shin, "Capital flows and the risk-taking channel of monetary policy", *Journal of Monetary Economics*, vol 71, 2015, pp 119–32. We should also recognise that you can get currency overshooting for reasons that are not strictly related to the risk-taking channel. What the channel does is to provide an important extra kick and a different way of looking at old relationships.

[9] See P O Gourinchas and M Obstfeld, "Stories of the Twentieth Century for the Twenty First", *American Economic Journal*, vol 4, no 1, 2012, pp 226–65. The authors find that the combination of a rapid increase in leverage and a sharp real appreciation of the currency is perhaps the most reliable indicator of financial vulnerability and of subsequent crises. The BIS has also published work on this in its Quarterly Reviews (see www.bis.org/publ/qtrpdf/r_qt0212e.pdf).

[10] See V Bruno and H S Shin, (2015) "Cross-border banking and global liquidity", *Review of Economic Studies*, vol 82, no 2, 2015, pp 535–64.

[11] The BIS has produced a significant set of documentation on this issue. See, in particular, C Borio and P Disyatat, "Global imbalances and the financial crisis: link or no link?", *BIS Working Papers*, no 346, 2011; and S Avdjiev, R McCauley and H S Shin, "Breaking free of the triple coincidence in international finance", *BIS Working Papers*, no 524, November 2015.

3. Spillovers of AEs' unconventional monetary policies (UMPs) and consequences for EMEs

As we also all know, AEs indeed addressed the GFC using unprecedented policies that prevented another Great Depression. At the same time, in part due to the difficulty of implementing a more comprehensive set of policies (including structural reforms in many AEs), the monetary component[12] of these UMPs has been maintained for a prolonged period (for almost eight years now), creating extremely accommodative financial conditions that contributed to the emergence of a set of collateral or spillover effects, eg massive capital flows to EMEs.

The problem is not capital flows per se, but their composition, volume and intensity – when they are too large, they can lead to excessive credit expansion, lower quality of credit origination, increased financial system exposure to exchange rate risk, asset price distortions (including excessive exchange rate appreciation), financial volatility and inflationary pressures (if the inflationary effects from the boom in aggregate demand surpass the opposite effect stemming from exchange rate appreciation). Easy global money can boost domestic demand in whatever policy stance the economy might need to be; it amplifies expansion beyond what policymakers might desire. It is important to note also that, to avoid excessive currency appreciation, some EMEs and AEs have kept their domestic monetary conditions much easier than otherwise, perhaps in a sort of "competitive easing" mode. Conversely, policymakers might have to slow down an expansionary business cycle sooner than envisaged if the "party gets too wild too soon". In any event, this exuberant, "feel-good" mindset complicates even further domestic political economy (which is sometimes already complex even without easy money). It hampers the capacity to slow down the "party" with fiscal policy instruments that depend on political cycles, for all countries, AEs and EMEs alike. Then, a monetary policy tightening might exacerbate short-term inflows and compound potentially destabilising forces in domestic asset markets.[13] It is a threat to financial stability, and, in particular, the collateral effect of UMP in EMEs was real exchange rate appreciation, a widening of external imbalances, more rapid credit and monetary expansion, and asset price pressures, as documented for example in the case of Brazil.[14]

Therefore, in addition to the behaviour of bank lending in general, for both EMEs and AEs the GFC did present specific and more complex macrofinancial stability issues. EMEs were used to managing "sudden stops" of capital flows; AEs, less so. Now, they had to learn how to maintain macrofinancial stability in a situation of "sudden floods" of capital flows. In other words, how should the transmission of zero lower bound-related external financial exuberance into their local asset and credit markets be avoided? For those using inflation targeting frameworks, the tricky analytical issue became how, if and when to complement monetary policy with macroprudential tools (MaPs).[15] Moreover, whether periods of

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[12] A combination of operating the base monetary policy rate close to zero (the zero lower bound), conducting large purchases of various assets to compress the term premium (quantitative easing, QE) and communicating explicitly and loudly to markets that such policies will remain in place for a prolonged period of time (forward guidance).

[13] In 2010 alone, emerging market and developing economies received almost USD 225 billion in net portfolio flows. This was more than double the already very strong portfolio flows received in 2007, just before the crisis, and can be compared to an average level of net portfolio flows below USD 20 billion earlier in the decade.

[14] See M S Mohanty, "The transmission of unconventional monetary policy to the emerging markets", *BIS Papers*, no 78, September 2014; and J Barata, L A Pereira da Silva and A Soares, "Quantitative easing and related capital flows into Brazil: measuring its effects and transmission channels through a rigorous counterfactual evaluation", Central Bank of Brazil *Working Papers*, no 313, July 2013, forthcoming in *Journal of International Money and Finance*.

[15] See L A Pereira da Silva and R Harris, "Sailing through the global financial storm", Chapter 7 in B Carrasco, H Mukhopadhyay and S Gokarn (eds), *Managing capital flows: issues in selected emerging market economies*, ADB and Oxford, 2014. During the

excessive inflows need to be addressed through a combination of monetary, fiscal and capital flow management (CFM) policies remains an important policy issue for both EMEs and AEs. Indeed, depending on the nature of shocks, the scope for using monetary policy may be limited, since higher local interest rates might just add to the traditional "pulling effect" of monetary policy and increase sudden floods of capital. That might represent a serious issue for EMEs as these flows are often a compounding factor for macroeconomic and financial instability.[16] It is also important to note that some AEs (eg those in a currency union or small open economies surrounding a large global economy) faced similar challenges, as indicated above. Large capital flows and their consequences (eg currency appreciation, financial exuberance) had to be addressed by European AEs. In that sense, these issues represented an "equal opportunity menace"[17] for policymakers who wanted to maintain macroeconomic and financial stability but had a limited set of tools.

4. Policy responses in AEs and EMEs: enlarging the toolkit, taking a comprehensive approach and using all instruments in a balanced way

Fortunately, many EMEs and AEs learned quickly how to enhance their policy frameworks. All understood that it was necessary to enlarge the toolkit of policy instruments to address the exceptional circumstances they were facing and despite the inherent difficulty of the extraterritorial impact of UMPs and the complex behaviour by a number of investors and market participants.

First, and from a purely analytical perspective, it can be shown using DSGE modelling techniques that inflation targeting frameworks whose central policy instrument is the base interest rate can function well with MaPs as complementary tools to address both macroeconomic and financial stability issues.[18] When the typical open economy (AEs and EMEs alike) is hit by a sudden flood, the optimal policy response is often a combination of a traditional monetary policy response (in the form of a standard Taylor rule) with MaP interventions. A more complex but also very relevant issue is whether this type of combination

phase of large inflows in 2011–12, corresponding to the beginning of the Federal Reserve asset purchase programmes or QE in the US and massive capital inflows into Brazil, a combination of monetary policy and MaPs tightened capital rules. These measures aimed at calibrating consumer credit growth (eg asking more capital for some consumer loans, lowering loan-to-value ratios (LTV) and hiking reserve requirements). Hence, large capital inflows were "managed" through price (des)incentives and not through typical quantitative controls. In any event, in Brazil household debt was also monitored, and reserve requirements were raised to reduce excessive bank FX exposures.

16 See R Rajan, "Competitive monetary easing – is it yesterday?", speech at the Brookings Institution, Washington DC, 10 April 2014;, and H Rey, "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, August 2013, pp 285–333.

17 The expression was used for banking crises; see K Rogoff and C Reinhart, "Banking crises: an equal opportunity menace", *NBER Working Papers,* no 14587, December 2008.

18 See P-R Agénor, K Alper and L A Pereira da Silva, "Sudden floods, macroprudential regulation and financial stability in an open economy", *Journal of International Money and Finance*, vol 48, 2014, pp 68–100. For a review of EME approaches to this issue, see P-R Agénor and L A Pereira da Silva, "Inflation targeting and financial stability: a perspective from the developing world", CEMLA and IDB, 2013, http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=38367231.

can also prevent the surge of a financial boom and, if so, what type of countercyclical MaP instrument (eg cyclically adjusted provisioning, reserve requirements, capital buffers) performs best.[19]

Second, and from a more practical perspective, many central banks in both EMEs and AEs quickly gained this experience in dealing with large and volatile capital flows. There was also a contribution from a set of documents and procedures produced by international institutions, especially the BIS, the FSB and the IMF.[20] What can we get from all this?

In general terms, addressing the potentially destabilising forces of large capital movements requires a balanced, encompassing and comprehensive set of policies where each and every policy instrument should play its role.[21] Using one specific policy excessively might create distortions and reduce the efficiency of the rest. The good news is that the old Mundell-Fleming-related pragmatic policy framework described above can work well when it is kept as resilient and strong as possible (eg the flexible exchange rate regime, the sound fiscal stance generating low levels of indebtedness, a credible IT framework). But it is paramount, when facing rising financial euphoria that transmits into the real economy and agents' behaviour and expectations, to work as hard as possible against the powerful pressure to accommodate political economy dysfunctions that end up creating more debt and make the fiscal stance more and more unsustainable. Managing aggregate demand effects of inflows is key. But, as I pointed out, raising interest rates in response to a boom triggered by capital inflows may trigger even more capital flows; therefore, the countercyclical role of other demand management policies (especially fiscal policy) is paramount in helping to moderate real exchange rate appreciation and dampening the relative price of non-tradable goods. Maintaining a credible macroeconomic stance only works as long as public finances are perceived as sound and investors, both foreign and domestic, do not lose confidence in the economy's underlying fundamentals.

Managing aggregate demand pressure to maintain macroeconomic and financial stability is necessary, but ***developing growth potential through structural reforms is also very important***. Not only does it strengthen solvency ratios and fundamentals, but it also allows more room for manoeuvre for social improvement, which, in turn, obviously positively affects the stability of institutions and social welfare. It is, as always, a delicate balance with trade-offs. There might be a conflict between mitigating financial volatility in the short run through regulatory instruments that reduce incentives for risk-taking and the long-run cost of not allowing enough financing of risky projects that may help increase potential growth.

Keeping the local financial system strong and solid is also relevant when financial conditions ease globally. How? Through tough and intrusive supervision with the relevant and timely information (market infrastructure) about vulnerabilities so that the regulator can act pre-emptively. Indeed, it is essential to preserve the robustness of the financial system. There should be only responsible

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[19] For a discussion of which type of MaP would best fit an explicit financial stability objective under an IT regime, see P-R Agénor, K Alper and L A Pereira da Silva, "Capital regulation, monetary policy and financial stability", *International Journal of Central Banking*, vol 9, September 2013, pp 193–238 and "External shocks, financial volatility and reserve requirements in an open economy," Central Bank of Brazil *Working Paper*, no 396, August 2015; and P-R Agénor and L A Pereira da Silva, "Cyclically adjusted provisions and financial stability", unpublished mimeo.

[20] See FSB-IMF-BIS, "Macroprudential policy, tools and framework: progress report to the G20", 27 October 2011; Bank for International Settlements, "The international monetary and financial system", 85th Annual Report, June 2015; C Borio, "The financial cycle and macroeconomics: What have we learnt?", *BIS Working Papers*, no 395, December 2012; IMF, "Key aspects of macroprudential policy", www.imf.org/external/np/pp/eng/2013/061013b.pdf, 2013; IMF, *The interaction between monetary and macroprudential policies*, www.imf.org/external/np/pp/eng/2013/012913.pdf, 2013; and O Blanchard, D Romer, M Spence and J Stiglitz (eds), *In the wake of the crisis: leading economists reassess economic policy*, IMF, 2012.

[21] See J Caruana and B Cohen, "Five questions and six answers about macroprudential policies", *Banque de France Financial Stability Review*, vol 18, April 2014.

and prudent reliance on cross-border financing. Foreign currency debt should also remain under control, with the bulk of it hedged through exports, assets held abroad or financial hedges.

Communicating policy choices well is also important. Here one has to be realistic about how the Tinbergen separation principle operates in practice. While communication can facilitate understanding that each policy objective should be addressed by one policy instrument, naturally there could be – and indeed there are – grey areas and complications. Despite that, the policy framework should ensure that there is always ex post self-reinforcing complementarity between policies. For example, MaPs are geared to addressing financial stability and monetary policy price stability, but MaPs do influence the transmission mechanism of monetary policy. Understanding separation with complementarity helps to strengthen the rationale and credibility of the policy framework as a whole. MaPs tend to work through the domestic financial system and therefore might miss direct borrowing abroad by firms. There is still relatively little knowledge about which measures could deal with this channel. So at some point one might need to carefully look at how CFMs could also be part of a broad toolkit. There are trade-offs. CFMs need to be brought into the discussion with the understanding that they might create perverse incentives and additional problems of outflows and flight to quality, credibility and mistrust. In any event, one should not expect too much from any single measure. A combination of measures is more effective, especially if they are well explained.

Finally, ***while keeping the floating exchange rate regime as a first line of defence, it might be useful to smooth excessive exchange rate volatility that can affect financial stability***. Many EMEs are already doing FX interventions, and there are many avenues to do so, depending on the characteristics of the FX markets, but using, directly or indirectly, some combination of self-insurance (eg international reserves) and access to multilateral protection seems to be efficient.

5. Reversal of AEs' UMPs and novel consequences for EMEs and AEs in an environment of ultra-low interest rates: FX hedge, interventions for protecting financial stability

As we also know very well, the "sudden floods" described above are always followed by "sudden stops" à la Calvo. Those episodes were usually restricted to EMEs that had to react to risk aversion using a standard recipe of policy tightening to reduce any perception of excessive vulnerability.[22] What is new in today's world is that the normalisation of monetary conditions will, most likely, start in the US while major systemic AEs (eg the euro zone and Japan) will retain their still accommodative monetary stances for quite a while. Overall, because that would be a result of economic recovery in the world's largest economy, it would be a net positive.

In any event, when the Fed started communicating in May 2013 that it could start moderating its asset purchase programme, global financial markets naturally became more volatile and there was a process of repricing risks, sometimes leading to a sell-off of EME assets. As had been observed, market perceptions towards EMEs seemed to have shifted more than fundamentals might have warranted: the (relatively) more optimistic view of the immediate post-GFC rebound was replaced by a gloomy pessimism, especially in the wake of a higher than expected moderation in commodity prices. However, by end-2013, and since then, the tapering took place, and there was a significant improvement in sentiment, and more cautious and detailed communication including about the next logical steps by the Fed regarding the

[22] The mere talk of reducing Fed asset purchases triggered large capital outflows in 2013. Capital flows have recovered since the "taper tantrum" but remain very volatile, mostly driven by shifting expectations about US monetary policy.

timing of beginning of rate movements. There too, the general sense is that the full exit from UMP with a rate increase, at the appropriate time, is a welcome transition to more normal global monetary policy conditions, even though it has been and might continue producing a re-pricing of financial assets.

And indeed, markets expect the Fed to lift off its base target rate at its December 2015 meeting (eg the current market-implied probability), even if there are no signs of tightening in the euro area or Japan – and in fact, quite the contrary. A Fed tightening might produce some volatility in capital flows and asset prices, depending on how markets price the timing, size and length of this cycle, how the monetary policies in other areas communicate their intentions, how perceptions evolve about the interplay of this Fed lift-off with a more prolonged period of loose monetary policy in Europe and Japan.

If volatility increases, it could augment the many remaining policy challenges associated with new risks, new repricing and their transmission through, for example, one key asset price which is the exchange rate. In particular, AEs and EMEs alike will have to wonder how effective the exchange rate is as a shock absorber. How sensitive are net exports to it? To what extent is the demand switching effect offset by a financial risk-taking channel associated with exchange rate overshooting and sharp swings in risk premia? How far do these effects depend on country-specific and global factors (eg global financial conditions, high domestic public and private debt, procyclical fiscal policy, commodity prices)? How can central banks best address the corresponding challenges?

So this transition, as welcome as it might be, might not be smooth. In particular, despite having used MaPs to avoid excessive indebtedness of the private financial sector, an EME like Brazil knew that risks were there and designed and implemented a foreign exchange intervention programme to provide timely and ample hedging to mitigate financial risks arising from monetary policy normalisation in the US. The programme was implemented from August 2013 to March 2015 and essentially sells currency derivative swaps that are settled in domestic currency.[23] It is important to understand that such interventions are done with the sole purpose of ensuring financial stability and not to direct markets towards a specific pricing of foreign assets.

Whether one anticipates a Fed rate hike scenario similar to 1994 (less orderly in terms of how short-term rates transmitted to longer-term rates) or 2004 (more orderly), and irrespective of efforts by the FOMC to communicate its policy stance and prepare markets as well as it could, the "old" textbook recipe very much remains valid. It is to strengthen policies. And there, we might find several clusters of EMEs. Some have done more or less well. Others might have frameworks that are not seen as strong and resilient enough, for example because of their excessive private and/or public debt.[24] For those EMEs whose public debt ratios eventually deteriorate too much, the normalisation of monetary conditions might lead to the classical spiral of capital outflows, depreciation, an increase in risk premia, a possible downgrade by rating agencies etc, until policies are strengthened and the spiral stops. Until then these EMEs might face a negative outcome that affects private sector confidence.

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[23] Instead of using classic sterilised interventions, Brazil implemented a large intervention FX programme not by selling US dollars directly to buy domestic currency (BRL) but by selling currency derivative FX forwards. These currency derivative swaps are not settled in US dollars but in BRL. The contract between the central bank and dealers pays the difference between the BRL/USD FX rate at the beginning of the contract and the actual FX rate at the end, plus a dollar-linked onshore rate of interest. In return, the central bank receives the cumulative overnight interbank rate for the period of the contract, in BRL. Therefore, the central bank is insuring buyers against BRL depreciation with no direct usage of USD reserves. The dealer can be either a bank that resells the contract to an end user or a financial institution itself. The programme was successful in preserving financial stability, providing FX hedges to private agents. Approximately 80% of the stock of swaps is allocated in non-financial companies. The total amount supplied by April 2015, approximately the equivalent of USD 114 billion, corresponds to about 30% of Brazil's foreign exchange reserves.

[24] As stated above, local political economy conditions usually explain the intensity and duration of fiscal and parafiscal countercyclical responses to the GFC. When those were excessive and/or compounded by other factors, the result was usually the emergence of typical "twin" imbalances (eg current account and fiscal deficits) signalling excessive domestic absorption.

6. A new, unknown collateral effect: balance sheet effects of prolonged negative interest rates in AEs

Memories of the Asian crisis are still vivid, and excessive capital flows are the most obvious mechanism through which UMP and its exceptionally low interest rates spill into Asia. But volatile capital flows are not the only, and perhaps not even the most important, spillover to EMEs in general, some AEs and also perhaps the Asian economies.

Very low (or negative) interest rates are also having an important impact on the balance sheets of financial institutions worldwide and the way the financial system operates. Less well understood so far, but not less important, are the mechanisms that operate through the balance sheets of financial intermediaries, firms and households in the US and other advanced economies.

The fundamental problem of every investor is that now that interest rates are low, portfolios do not generate much yield. So far, the decline in interest rates has pushed up the value of bonds and equities and has largely offset this. But at some time this offsetting effect will stop. Investors will face capital losses if interest rates go up and no returns if they do not. Neither of the two prospects is appealing.

This matters even if financial intermediaries themselves may be sheltered from capital losses if interest rates go up, either because the value of their liabilities will also fall or because they pass on the risk to their ultimate clients. But somebody has to bear the losses, and in this case this will be the ultimate investor, particularly households and especially those who have saved for retirement. In the absence of other policies in AEs, central banks' role is stretched to the limit. That might result in new behaviour by households where there could be a disincentive to save if yields on safe long-term assets remain very low for a prolonged period of time. Moreover, so far this unusual situation has not prompted the expected strengthening of the credit multiplier and/or financial accelerator. Risk-taking remains subdued for investment in the real sector of AEs' markets while increasingly generating potential mismatches in the balance sheets of large corporate pension funds, life insurance companies and households.

Why should this matter for Asian central banks, except for their role as reserve managers? First, for financial stability reasons: asset managers or other intermediaries may retrench or, on the contrary, hunt for yield in EMEs. That part we know, and we have seen a lot of this already and know how to deal with it, as described above. More difficult to foresee are changes in savings and investment by ultimate investors. Households may be forced to save more to maintain living standards after retirement, which should increase investable assets but depress consumption even further. This could depress demand in AEs and spill over to Asia through trade, ie lower demand for goods and services. Low returns could also lead to changes in asset allocation: first of all, it could lead to search for yield (see the box). But it could also lead to the opposite: a retrenchment into low-risk/low-return projects in order to safeguard existing living standards. There is some anecdotal evidence from Japan for this, but it is far from conclusive.

Finally, low returns could undermine pension and social security systems, which are a key element of the social compact especially in many European countries but also in many ageing Asian societies.

7. Conclusion – capital flows in an environment of ultra-low interest rates: an equal opportunity menace for EMEs and AEs alike

My remarks can be summarised as follows. First, you can do much greater damage to macro and financial stability when excessively expansionary credit and not just fiscal policy is used. The BIS has been analysing these risks for a long time now and is looking into the dynamics of global financial cycles and how to make them less prone to crises. This is not an only EME problem; it also affects AEs. If EMEs engaged in

macropopulism mostly in its "fiscal" dimension in the 1990s, we could perhaps say that some AEs did it in a "financial" or "credit" dimension in the 2000s. That was perhaps compounded by the power of financial innovation; by the risk-taking channel of cross-border financial flows and the usage of financial round trips between AEs themselves. That might explain much of the subprime crisis and the GFC, slightly complicating the now abundant narratives, among which an important one focuses, inter alia, on the regulatory dimension,[25] especially in the housing market in the run-up to the GFC.

Second, AEs had instruments and credibility which enabled them to address the GFC using unprecedented policies, which indeed saved the world from another Great Depression. But in the absence of other policies, especially structural reforms in AEs, these unprecedented or unconventional policies have been maintained for such a prolonged period of time that they might now be producing decreasing positive marginal returns and increasing collateral effects. These new risks affect financial stability not only in EMEs but also AEs.

Third, and finally, while these collateral effects can be (and are being) managed in EMEs, which learned how to manage the spillover effects of UMPs into local credit and asset markets, it is unclear what collateral effects might be seen in the future in AEs (see the box): low interest rates for long periods might begin to have a profound impact on the economy and even society at large by reducing returns of pension funds and perhaps affecting household behaviour. We understand some of the mechanisms, for instance capital flows, but know much less about the impact on the balance sheets of financial intermediaries, households and firms – especially large institutional investors such as pension funds and insurance companies – let alone about the wider consequences of how this might affect intertemporal social contracts through the assets that these balance sheets carry.

Box 1

The effect of low/negative interest rates on large pension funds and life insurance companies

Anecdotal evidence, articles and reports from various sources all point towards the challenges, particularly for life insurance companies and defined benefit pension plans.

Low interest rates are indeed a concern for pension funds and life insurance companies according to the OECD.① The outlook for the solvency position of pension funds and life insurance companies is of concern. Insofar as their promises are linked to evolving parameters or can be adjusted to the new environment of low interest rates, low inflation and low growth, these institutions may be able to weather the situation. However, there is a very serious concern for the financial outlook should these institutions become heavily involved in an excessive search for yield in order to fulfil any fixed guarantee promises they may have made when interest rates were higher.

The OECD's views are shared by the European Insurance and Occupational Pension Authority (EIOPA), which also highlights the creation of hybrid schemes.

Although there should be a positive impact on the European insurance and pension sectors in the long run when economic growth improves, new challenges have been created in the short term. QE has further lowered the risk-free rate, with negative consequences for insurers and pension funds. It is, and will be, extremely difficult for insurers and pension funds with the most exposed business models to maintain their profitability without taking more risks.②

[25] See A Blinder, *After the music stopped*, Penguin Press, 2013.

Moody's expects low interest rates to reduce the profitability and capital levels of life insurance companies.③ Property and casualty (P&C) insurers will be less affected. Insurers' investment returns will continue to decline. For life insurers that typically offer a guaranteed rate to policyholders, this increases the risk that, in some countries, investment returns will fall below the guaranteed rate, leading to losses and declines in capital. In many jurisdictions, the effects of low rates are not yet fully visible in insurers' accounts, but losses will be reported progressively. Low interest rates will reduce profits for P&C insurers, but are unlikely to hit their capital.

Standard & Poor's concurs with Moody's assessment about the impact on life insurance companies. "Lower for even longer" interest rates prolong the pain for Europe's insurers.④ However, S&P points out that a number of mitigating features have, to date, dampened the effect of low yields on ratings. Diversification is one key differentiating factor. Insurers that have strategic options to deploy capital to products, business lines or geographies that are less sensitive to low interest rates are likely to exhibit greater stability. There is also evidence of tactical shifts. For new sales, insurers are repricing products, reducing new business guarantees and developing new products with different guarantee structures. However, with yields so low, the ability to offer competitive rates that appeal to policyholders and sufficiently differentiate one insurer's products from those of competing providers – such as banks and asset managers – is difficult and could threaten some business models.

PensionsEurope (a trade association) highlights⑤ challenges and calls for regulatory intervention. Pension funds are by their nature long-term investors due to the duration of their liabilities, but are now faced with the effects of short-term QE. Therefore, national and European regulators need to find an adequate balance between the short-/medium-term challenging environment and the sustainability of pension promises. PensionsEurope further highlights that pension funds' investments are guided by the prudent person principle and therefore have limited options to move into other, riskier, asset classes. Moreover, the mark-to-market valuation of liabilities applied to certain pension funds renders the solvency position of those pension funds very challenging.

The International Association of Insurance Supervisors highlights the impact of low interest rates and cautions about the potential impact of a sharp interest rate increase.⑥ While the insurance industry has seen declines in its investment yields, this is an acute problem for life insurers, which depend on investment income to meet their policyholder obligations. Further, life insurers are faced with, among other things, asset/liability duration mismatching, re-investment risks and portfolio maturation with products containing guarantees that are not realisable in the present environment. While increases in interest rates may help to mitigate some of the above, the pace at which this happens needs to be measured as a sharp rise in interest rates can worsen insurers' overall performance. A slower, more gradual, rise in interest rates would be the ideal scenario for life insurers, as they would have time to adjust and bring their credited interest rates in line with market interest rates, appropriately matching their assets with their liabilities. However, rapidly rising interest rates could lead to a substantial decline of the market value of insurers' bond portfolios. Investment results would be affected by losses on bonds, as far as capital market gains and losses run through the profit and loss account. Moreover, rising interest rates may tempt policyholders to surrender their policies for new policies with higher crediting rates or other financial products, such as bank certificates of deposits offering higher yields. While life insurance companies may then need to sell assets to allocate the funds to pay for the surrender of policies, the penalties that usually go with this make it difficult for policyholders to withdraw their money, and expose life insurers to a bank run-like scenario.

① Source: OECD, *OECD Business and Finance Outlook 2015,* Chapter 4. ② Source: EIOPA, *Financial Stability Report*, May 2015, pp 11–12. The report also states: "Traditional Defined Benefit plans (DB), 75% of the sector in 2014 in terms of assets, with guaranteed pensions based on a predefined formula, are directly adversely affected by those developments" (p 38). "However, despite the current low yield environment the average rate of return for pension funds slightly increased during 2014. The average ROA in 2014 (un-weighted 8.6%, weighted 12.6%) was higher compared to 2013 (unweighted 6.0%, weighted 6.1%). This can be attributed to the exceptionally good performance of the equity and fixed income markets during 2014" (p 41). "The policy implication is that new types of hybrid (HY) schemes have emerged to deal with the current challenging macroeconomic environment" (p 39). ③ Source: Moody's, "Low interest rates are credit negative for insurers globally", March 2015. ④ Source: Standard & Poor's, *European Insurance Credit Outlook 2015*, December 2014. ⑤ Source: PensionsEurope, *PensionsEurope Paper on the effects of Quantitative Easing on pension funds*, April 2015. ⑥ Source: IAIS, *Global Insurance Market Report*, December 2014 pp 19–21.