

## More pluralism, more stability?<sup>1</sup>

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I would like to thank the organisers for the kind invitation to speak at this prestigious conference. I am delighted and honoured to be in such distinguished company.

The question I would like to address today is whether a more pluralistic international monetary system – one with more international currencies on a more equal footing – would enhance global monetary, financial and macroeconomic stability.

This is a perennial question. It was, for instance, just as prominent under the Bretton Woods system as under the arrangements that have followed – which some regard as a “non-system” (eg Padoa-Schioppa and Saccomanni (1994)). And it presupposes the answer to another, more fundamental, question: what is the Achilles heel of the international monetary and financial system (IMFS)?

Note that I am choosing my words carefully. For, the “financial” dimension is just as important as the “monetary” one, although the shorthand “international monetary system” is much more common. This tendency perhaps harks back to post-war arrangements in which, for quite some time, finance played a subordinated role owing to constraints on capital flows and foreign exchange transactions. As we all know, that world is long gone.

There are three takeaways from my presentation.

First, there is no doubt that the dominance of one currency creates challenges for the IMFS. Fundamentally, the domestic interests of the country of issue need not coincide with those of the system as a whole.

Second, it is less clear, though, whether a more pluralist system, even if it was achieved, could help address the IMFS’s main weakness. To my mind, that weakness is its inability to prevent the build-up and unwinding of hugely damaging financial imbalances, or outsize financial cycles, thereby amplifying weaknesses in national arrangements (Borio (2014a)). This is what, with a colleague, Piti Disyatat, we have termed its “excess (financial) elasticity” (Borio and Disyatat (2011)). Think of an elastic band that you can stretch out further and further but that, as a result, snaps back more violently.

Third, addressing this weakness would require stronger anchors at national and international level. Some progress has been made, especially at national level. But much more needs to be done.

In what follows, I will first recall some basic facts to illustrate the US dollar’s dominance in the IMFS. Here I will consider the dollar’s three familiar roles, as a means of payment, a store of value and a unit of account. I will then explore the possible problems that this can create and put forward three propositions. I will finally turn to possible solutions and make three observations.

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<sup>1</sup> I would like to thank Bob McCauley, in particular, for help in the preparation of these remarks.



## I – Stylised facts: the US dollar’s dominance

It may not be quite a monopoly, but the US dollar’s dominance in the IMFS is undisputable. And its role has not declined much, despite the waning heft of the United States in world output, which is now down to only one quarter. Some quick facts.

Take the US dollar’s role as means of payment (Graph 1). According the latest BIS survey of foreign exchange (FX) markets (BIS (2013)), in April 2013 the dollar was on one side of no less than 87% of overall foreign exchange trades and of over 90% in the pivotal FX swap market. The other currencies followed a long way back, with the euro at 33%, the yen at 23% and the renminbi at only 2% or so. Similarly, the dollar is the FX intervention currency of choice, except on the borders of the euro area.

Take next the US dollar’s role as a store of value (also Graph 1). At end-2015, more than 60% of FX official reserves were held in the currency, admittedly down from 70% in 2000 and 75% in 1978. This share is quite resilient, if one recalls that from end-1978 to April 2016, the dollar lost around 10% of its value against the DM/euro and close to one half against the yen. Again, the euro was a distant second, with a share of 25% and the yen an even more distant third, at 4%. The dollar’s share was similar if one also considers private sector claims: according to the BIS international banking and international debt securities statistics, it accounted for around 60% of all international assets in 2015 and a similar percentage of the liabilities, highlighting its key role as funding currency.

The dollar’s role as unit of account in trade is harder to assess, as the data are sparser (Ito and Chinn (2015)). But around half of non-US trade is denominated in the dollar, with the euro accounting for considerably less.

Even more importantly, the dollar exerts a powerful gravitational force on other currencies, as judged from how currencies move in relation to each other. Based on statistical techniques that seek to tease out this effect, if one considers the euro and yen as the other possible reference currencies and uses GDP weights, the “dollar zone” was, again, around 60% in 2014, the euro was second at only 25% and the yen a distant third (Graphs 2 and 3 from BIS (2015)). This gravitational pull, in turn, has a deep influence on the denomination of countries’ assets and liabilities and, hence, also on FX reserve composition, as it determines a portfolio’s sensitivity to exchange rate fluctuations (McCauley and Chan (2014), Borio et al (2008)). There is a clear positive relationship across countries between these shares and the degree to which currencies co-move with the dollar (Graphs 4 and 5).

To summarise: the dollar is involved in some 90% of all FX transactions, accounts for some 60% of official FX reserves as well as debts and assets outside the United States; has a similar weight as a gravitational force for other currencies and only a slightly smaller one as the currency of choice in the denomination of trade. The euro is a distant second, with weights ranging between one fifth and one third, and has a more regional character.

It is this dominant role, coupled with the depth and breadth of US financial markets,<sup>2</sup> that underpins the well documented asymmetric influence of US monetary and financial conditions on the rest of the world. US asset prices, such as bond yields, tend to lead those in other economies (Bauer and Neely (2014), Obstfeld (2015), Neely (2015)). And US monetary policy has an influence on monetary policy elsewhere over and above domestic conditions (Rey (2014), Edwards (2015), Hofmann and Takáts (2015), BIS (2015a)).<sup>3</sup> This, of course, is the rule, which means that exceptions are possible. For instance, of late in

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<sup>2</sup> See eg Cooper (2009) for an analysis that stresses the importance of this factor. There are, of course, important broader geo-political considerations, which, however, are not considered here.

<sup>3</sup> On this, see also Obstfeld (2015).

special circumstances, the euro has been the driving force, such as during the euro area sovereign crisis or when the ECB adopted extraordinary monetary policy measures. This has also been reflected in quantities, with a strong increase in the amount of securities issuance in euros.

The US dollar may not quite be the legendary unmoved mover of yesteryear, but is much more than first among equals.<sup>4</sup>

## II – Diagnosis: dominance, asymmetries and weak anchors

There are two related concerns with the dominance of one currency in the IMFS. One is that the “asymmetries” involved may exacerbate the tension between the interests of the dominant country, on the one hand, and those of the system as a whole, on the other. That is, the country “projects” its influence on the rest of the world, which cannot “insulate” itself. The other is that, more specifically, the IMFS may not have an effective anchor for monetary and financial stability.

At the cost of some oversimplification, there are two broad groups of arguments elaborating on these concerns.

One group includes *variants of the “Triffin dilemma”*. They share the view that inherent contradictions in the system guarantee its demise: the system is bound to produce terminal instability. The original Triffin (1960) variant posited that US short-term dollar liabilities had to grow to meet the demands of global trade, but this would eventually undermine confidence in the dollar’s convertibility into gold. The issue became moot with the breakdown of Bretton Woods and the adoption of flexible exchange rates. This version later gave way to a current account variant. Accordingly, US current account deficits were seen as necessary to provide the rest of the world with dollar liquidity, but this would eventually make the country insolvent.<sup>5</sup> The latest reincarnation of the dilemma is the “safe asset” version. Here, US public sector deficits are seen as necessary to provide the rest of the world with “safe assets”, but meeting this growing demand will eventually make the US government insolvent (Fahri et al (2011), Obstfeld (2011)).

The other, related, group of arguments includes *variants of the “exorbitant privilege”*.<sup>6</sup> Considerations of “fairness” aside, the United States is regarded as an unreliable anchor because the high demand for dollar-denominated debt means that it is not subject to sufficient discipline. It can run larger and more persistent fiscal deficits; it can run larger and more persistent current account deficits – the United States has more dollar-denominated liabilities than assets, so that a dollar depreciation actually makes the country richer<sup>7</sup> – and it can run a looser monetary policy for longer (eg McKinnon (2010)). Ultimately, this spreads instability to the rest of the world in one form or another, such as higher inflation.

My personal view can be summarised in three propositions.

*First proposition: the “strong” forms of the Triffin dilemma are debatable.*

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<sup>4</sup> For US perspectives, see Dudley (2014) and Fischer (2015).

<sup>5</sup> See Camdessus and Icard (2011), Paul Volcker in Feldstein (2013) and Prasad (2013). While this view is sometimes attributed to Triffin, Swoboda (2011), among others, has stressed that Triffin wrote about the capital account, not the current account.

<sup>6</sup> See Eichengreen (2011) for a review of the arguments.

<sup>7</sup> On this, see Tille (2003), Gourinchas et al (2012) and Bénétrix et al (2015).



The popular current account version is obviously wrong (Borio and Disyatat (2015)).<sup>8</sup> US dollar liquidity can be produced at will *regardless* of the US current account position. This can happen through the growth of the US balance sheet (assets and liabilities) – like that of any bank – or through the creation of dollar claims entirely outside the United States. Indeed, close to three quarters of the dollar debt of non-banks outside of the United States was held by non-US residents (McCauley et al (2015)). It never touched US shores. What matters for sustainability is the soundness of the corresponding balance sheets.

Similarly, the “safe asset” version does point to a valid tension, but it goes too far (Borio (2013)).<sup>9</sup> To my mind, it overestimates the precautionary motive in the growth of FX reserves and it underestimates the possibility of reducing liquidity needs at source. I will come back to both of these points in a minute.

*Second proposition: there is clearly a privilege, but, regardless of its exact and debated size, it is not obvious that it is at the root of the problem.*

In a world of free capital flows, countries that can borrow in domestic currency share some of the same features as the United States. For instance, Australia – another country with persistent current account deficits – comes to mind.

And incentives at the margin aside, the main question is how to establish strong anchors in *national* economies. The gains from global cooperation decline considerably if countries follow individually the “right” policies – the well known “envelope theorem” (Taylor (2013)).<sup>10</sup> But what are the “right” policies? What would be adequate anchors? This depends on assessments of the key weakness in the IMFS.

*Third proposition: the Achilles heel of the IMFS is that it amplifies the key weakness of domestic monetary and financial regimes, ie their inability to prevent the build-up and unwinding of hugely damaging financial imbalances. The system is “excessively elastic”. Inadequate domestic anchors meet inadequate international arrangements.*

Typically, the financial imbalances take the form of unsustainable credit and asset price booms that overstretch balance sheets on the back of aggressive risk-taking. Eventually, they lead to serious financial strains and major macroeconomic dislocations. There is growing evidence pointing to the huge output costs of financial crises and to the role of financial booms in causing them.<sup>11</sup>

The IMFS amplifies the weaknesses in domestic policies through the way domestic monetary and financial regimes interact (Borio (2014a), BIS (2015)).

Domestic monetary policy regimes pay little attention to the build-up of financial imbalances: their main focus is inflation but, as has become abundantly clear, the imbalances can grow even if inflation is low and stable. This easing bias then spreads from the core economies to rest of the world, regardless of their domestic conditions.

The bias spreads directly, through the extensive reach of international currencies, mainly the dollar, beyond national borders. Hence the huge post-crisis expansion of US dollar credit to non-residents – a key indicator of global liquidity. Between 2009 and end-2015 this key indicator of global liquidity was

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<sup>8</sup> For a further elaboration of this point, see also Bordo and McCauley (2016).

<sup>9</sup> See also Portes (2012).

<sup>10</sup> This is the basis for Taylor’s (2015) conclusion that, if national authorities follow inflation-focused instrument rule-based policies, there are no tensions between flexible exchange rates, independent monetary policies and free capital flows. The argument here is similar, but is much more concerned with policies that address financial imbalances as part of what it means to keep one’s own house in order.

<sup>11</sup> See eg Borio and Lowe (2002), Gourinchas and Obstfeld (2012) and Jordà et al (2011).



up by some 50% to \$9.7 trillion to non-banks and it doubled, to \$3.3 trillion, to those non-banks resident in EMEs alone, marginally down from its historical mid-year peak (Graph 6).

And it spreads indirectly, through policymakers' resistance to exchange rate appreciation out of macroeconomic, financial stability or possibly competitiveness concerns. Central banks in the rest of the world keep interest rates lower than otherwise and/or intervene in the FX market, further pushing down bond yields in the source countries (Graph 7, right-hand panel).

As a result, easing begets easing.<sup>12</sup> Thus, according to typical benchmarks, monetary policy has been exceptionally easy for exceptionally long at the global level (Graph 7, left-hand and centre panels). Importantly, in this story the increase in reserves is not so much precautionary, but the by-product of other policies.

In addition, the interaction of financial regimes reinforces and channels the monetary policy spillovers. It does so through the free mobility of capital across currencies and borders. As a result, external funding typically amplifies domestic credit booms (Borio et al (2011), Avdjiev et al (2012), Lane and McQuade (2014)). And exchange rates move too far ("overshoot") for exactly the same reasons as domestic asset prices do – when loosely anchored perceptions of risk and value combine with weak financing constraints.

Put differently, flexible exchange rates have only limited insulation properties (eg Rey (2013)), and an appreciation may even strengthen flows further, at least for a long while. In particular, the domestic exchange rate appreciation seemingly strengthens the balance sheets of borrowers in the foreign currency, encouraging further lending – the so-called "risk-taking channel" of the exchange rate stressed by my colleague Hyun Shin (Bruno and Shin (2015), Hofmann et al (2016)).

No doubt all this helps explain the build-up of vulnerabilities in EMEs (and not only there) post-crisis. These countries have seen outsize domestic financial booms, in the form of strong credit and asset price, especially property price, increases, powerfully supported by ample global liquidity.

Now, there have been signs that the domestic financial booms have been turning and external liquidity conditions, at least until recently, tightening. Importantly, in no small measure this reflects the perceived beginning of the US monetary tightening cycle. The confluence of the domestic and external waves can raise serious challenges for the economies concerned, especially owing to the simultaneous, and not unrelated, fall in commodity prices (Caruana (2016)). What from a short-term perspective may simply look like a spillover from EMEs to advanced economies, from a longer-term one is a spillback, a kind of boomerang effect. Financial market conditions have bounced back of late, following the turbulence at the beginning of the year. But the underlying vulnerabilities have not gone away.

Of course, nothing is really new here – nor should it be, if what we are seeing is indeed the reflection of the system's *structural* weakness. We have seen these patterns play out again and again ahead of previous financial crises in EMEs. And these mechanisms were also at work before the Great Financial Crisis (GFC). Then, as now, EMEs were already receiving strong inflows and under pressure to keep monetary policy easy. But their domestic financial expansions were younger, as many of these economies were still recovering from the crises in the mid-to-late 1990s. Financial cycles are considerably longer than business cycles, and have lasted on average between 16 and 20 years following financial liberalisation (Drehmann et al (2012), Borio (2014b)).

The pre and post-GFC differences are quite telling, too. Pre-crisis, much of the international credit expansion was between advanced economies, not least to the United States, and channelled through banks, not least from Europe. As argued in detail elsewhere, to my mind it was this surge, rather than a

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<sup>12</sup> See also Rajan (2014), who refers to this process as "competitive easing", as well as Taylor (2013, 2015).



global savings glut in EMEs (Bernanke (2005)), that better explains the role international finance played in the crisis (Borio and Disyatat (2011)).<sup>13</sup> I return to this point below. In addition, post-crisis more of the flows to EMEs have taken the form of securities than bank loans: as many crisis-hit international banks retrench, EME corporates have been turning to capital markets, tapping institutional investors and asset managers, notably through their off-shore subsidiaries.<sup>14</sup> This could affect the mechanisms through which financial strains might propagate, but not their underlying causes.

The elastic band can be stretched out further and further, but may snap back more violently.

### III – Possible solutions

The previous analysis has implications for the possible solutions. Let me make only three observations.

*First, it is not clear to me that more pluralism is the answer to the main problem.* True, it may impose greater discipline on the dominant country. Greater choice must surely help.<sup>15</sup> But more pluralism, per se, does not address the root problem, ie the absence of a global anchor. Could there not be a race to the bottom rather than to the top? And even if the SDR was placed at the system's centre, what would anchor the SDR?<sup>16</sup> Short of creating a supranational central bank that operated in SDRs, this would require an explicit link to national monetary policies; otherwise, the SDR would simply remain an additional instrument with but a limited impact on global financial conditions, at least in tranquil times. For instance, the ECU acted as a common reference for exchange rate adjustments in the European Monetary System (EMS), although even then the system was far from symmetrical, with the DM playing the main anchor role.<sup>17</sup>

*Second, solutions need to focus less on addressing current account imbalances and more on financial imbalances* (Borio and Disyatat (2011, 2015), Borio (2016)). That is, they need to focus more on gross capital flows (and the corresponding stocks) than on net flows. Net flows are the tip of the iceberg (Graph 8; note the differences in scales). Moreover, in some cases, a focus on current accounts could even be counterproductive. In particular, one should beware of recommending expansion in surplus countries that are exhibiting signs of financial imbalances. This is what happened in Japan in the late 1980s, contributing to the subsequent crisis (Shirakawa (2011)). More recently, the international community encouraged China's credit-fuelled post-GFC expansion – an expansion that lies at the heart of some of the debt challenges the country is now facing. Importantly, as these examples indicate, strong credit booms, including some of the most disruptive ones, have also occurred in current account surplus countries. Further back in history, the experience of the United States ahead of the Great Depression is a famous example (Persons (1930), Eichengreen and Michener (2013)).

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<sup>13</sup> For a similar view, see Shin (2012), who coined the term "banking glut".

<sup>14</sup> Interestingly, the role of non-financial firms echoes similar developments in the interwar years, in the context of the large capital flows that financed Germany; see Borio et al (2014).

<sup>15</sup> See Zhou (2009) and Coeuré (2015); for a view that the discipline is not working, see Mishra and Rajan (2016).

<sup>16</sup> For discussions of the role of the SDR, see eg Mateos y Lago et al (2009), Zhou (2009), Padoa-Schioppa (2010) Camdessus et al (2011) and IMF (2011).

<sup>17</sup> Moreover, if the SDR was used widely to denominate international assets and liabilities but remained an amalgam of national currencies, it is not clear that this would help support financial stability in a crisis. Runs on international banks with SDR-denominated liabilities instead of dollar-denominated liabilities, as experienced in 2008, would have required cooperation in funding operations by all of the central banks whose currencies were included in the SDR. Arguably, this may have complicated the response (BIS (2010, p 55)).



*Third, the solution requires stronger anchors for domestic regimes and their interaction.* To be sure, there is scope to improve international crisis management arrangements (BIS (2015)). But, as they say, one ounce of prevention is worth a pound of cure. And, while putting one's house in order is essential, it is not enough (Padoa-Schioppa (2008)): there is also a need to put the global village in order.

Domestically, as discussed in greater detail elsewhere, this means more systematically tackling financial booms and busts through a combination of monetary, prudential as well as fiscal policies, strongly supported by structural policies (BIS (2015b)). The key is to have policies that are more symmetrical over booms and busts so as to mitigate them without the risk of running out of policy room for manoeuvre over time.

Internationally, this means better internalising the possible spillovers and spillbacks of national policies. Three possibilities can be envisaged, ranked on a scale of increasing ambition (Caruana (2015), BIS (2015a)).<sup>18</sup> At a minimum, enlightened self-interest, based on a thorough exchange of information, should be feasible. This would mean that, when setting domestic policies, countries would individually seek to take spillovers and spillbacks more systematically into account. Large jurisdictions that are home to international currencies have a special responsibility.<sup>19</sup> Going one step further, cooperation could extend to occasional joint decisions, on both interest rates and foreign exchange intervention, beyond the well honed responses seen during crises. The third, most ambitious, possibility would be to develop and implement new global rules of the game that would help instil greater discipline in national policies (eg Rajan (2016)).

Based on this analysis, how far away is the international community from finding adequate solutions? The answer is "still a long way". True, progress has been substantial in the prudential domain. But much more would be needed regarding monetary regimes. Even at the national level, it has proved difficult to incorporate systematically financial stability considerations, which are generally left to prudential policy. And these problems are simply compounded at the international level.<sup>20</sup> The preconditions for progress are consensus on diagnosis, which would put financial imbalances at the heart of the problem, as well as a strong sense of urgency and shared responsibility internationally. At present, neither precondition is met.

## Conclusion

I have argued that the Achilles heel of the IMFS is that it *amplifies* the key weakness of domestic monetary and financial regimes, ie their inability to prevent the build-up and unwinding of hugely damaging financial imbalances (outsized financial cycles) – or "excess (financial) elasticity". If so, the main problem is the lack of an effective anchor for the system as a whole. It is not clear to me that more pluralism is the answer. Rather, the answer would be to establish stronger anchors at national and international level. This means not just putting one's house in order, but also putting our global village in order. Some progress has been made, especially at national level. But much more needs to be done, especially in monetary regimes and internationally.

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<sup>18</sup> On these issues, see also Saccomanni (2015). And for an analysis of how central bank co-operation has waxed and waned through history in light of the evolving IMFS, see Borio and Toniolo (2008).

<sup>19</sup> For the dominant country, it means behaving more like a Stackelberg leader rather than just another player in a Nash equilibrium.

<sup>20</sup> For example, analytically, the workhorse macroeconomic models in international finance generally fail to incorporate the various financial channels through which spillovers and spillbacks can occur (Avdjiev et al (2015)).



The risks of failing to make progress are material. The stakes are high. This makes it all the more important to reach a consensus on the diagnosis and possible solutions. That's why conferences like this are especially welcome.





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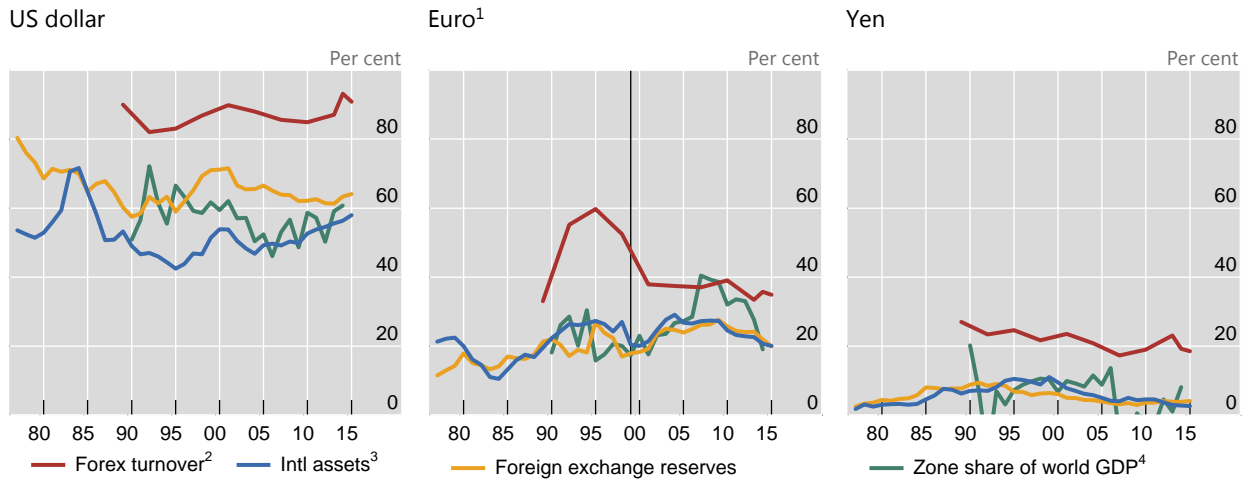
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### The international roles of currencies: US dollar remains dominant

Graph 1



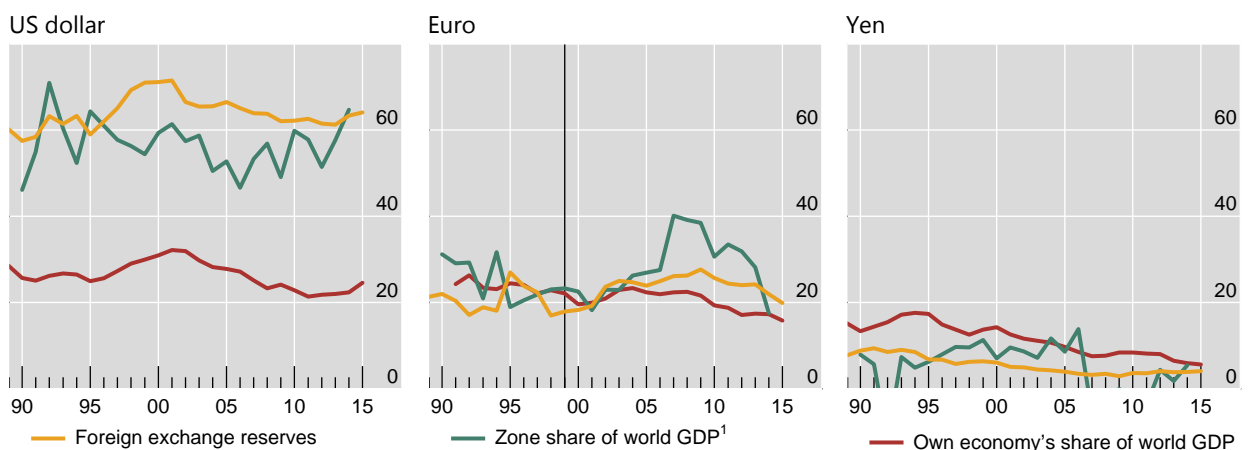
<sup>1</sup> Before 1999, "euro" aggregates available predecessor currencies. <sup>2</sup> The shares sum to 200% because each transaction involves two currencies. 2015 is estimated based on CLS trading data for February. <sup>3</sup> Includes bank deposits of non-banks and debt securities. Bank deposits are proxied by all bank liabilities before 1995. For the euro area, bank deposits exclude deposits vis-à-vis euro area banks. Debt securities are based on BIS international debt securities statistics before 1999 and the ECB's narrow measure of euro bonds since 1999, which excludes euro area residents' euro issues. <sup>4</sup> Estimated as each economy's share of PPP GDP, plus the elasticity-weighted share of all other economies' PPP GDPs.

Sources: ECB; IMF; CLS; Datastream; national data; BIS international debt securities statistics; BIS calculations.

### Currency zones and global reserves composition: dollar punches above its weight

In per cent

Graph 2



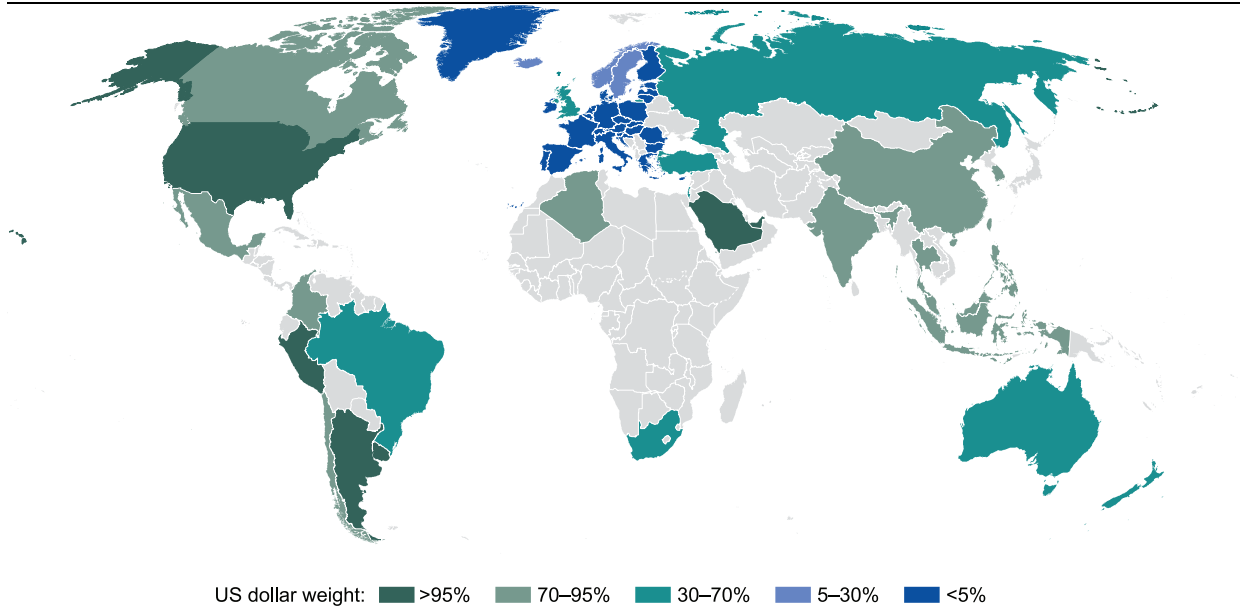
<sup>1</sup> Zone share estimated as the own economy's share of PPP GDP, plus the elasticity-weighted share of all other economies' PPP GDPs. The elasticities are derived from a regression of weekly changes in the domestic currency/US dollar rate against a constant, and changes in the euro/dollar (prior to 1999, Deutsche mark/dollar), yen/dollar rates and the VIX, during the corresponding year. Negative values of yen bloc arise from negative coefficients on the yen that can be interpreted as reflecting use of the yen as funding currency in carry trades.

Sources: IMF; BIS calculations.



Shades of the dollar zone: more than half the global economy

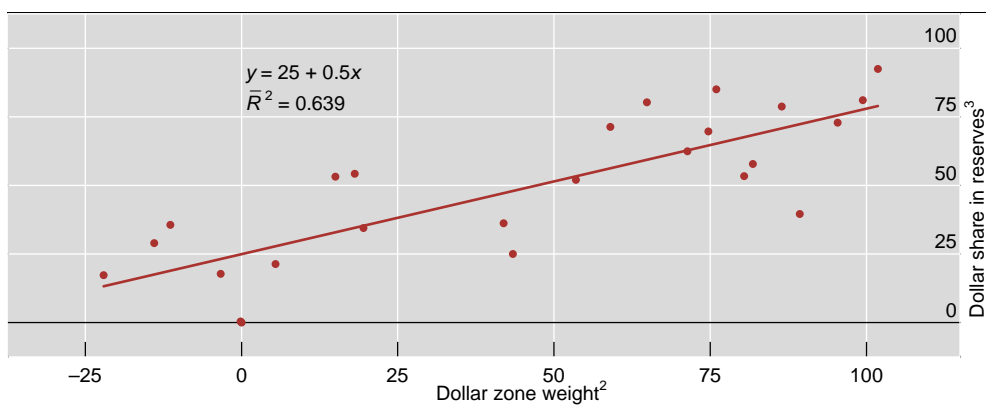
Graph 3



Source: BIS calculation based on average elasticities of the national currency's dollar exchange rate with respect to euro/dollar and yen/dollar rates for 2011–14, inclusive.

The dollar's pulling power influences FX reserves allocation<sup>1</sup>

Graph 4



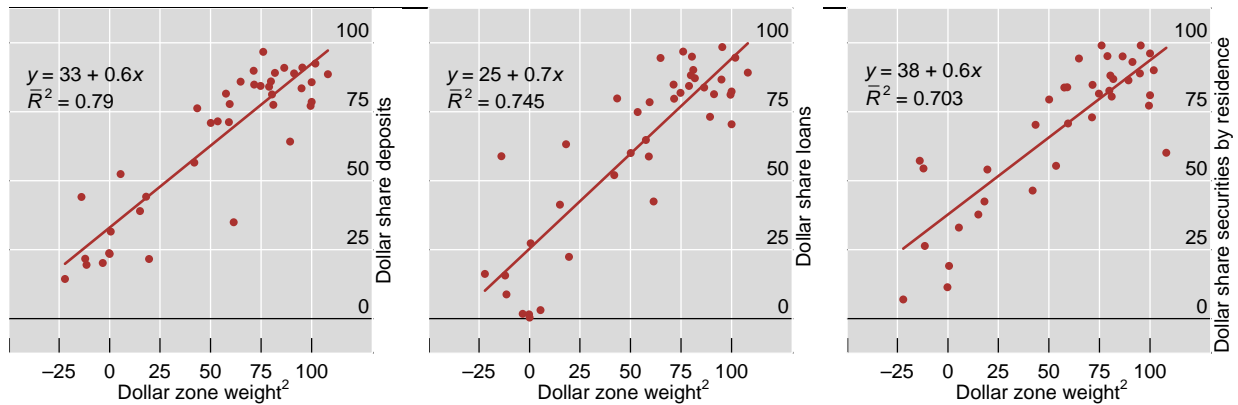
<sup>1</sup> Country-specific dollar-zone weights plotted against the dollar's share in the country's FX reserves, 2014. <sup>2</sup> Average over four years. <sup>3</sup> For Colombia, New Zealand, Philippines and Turkey, earlier data used.

Sources: National data; BIS calculations.



### The dollar's pulling power influences private sector portfolios<sup>1</sup>

Graph 5



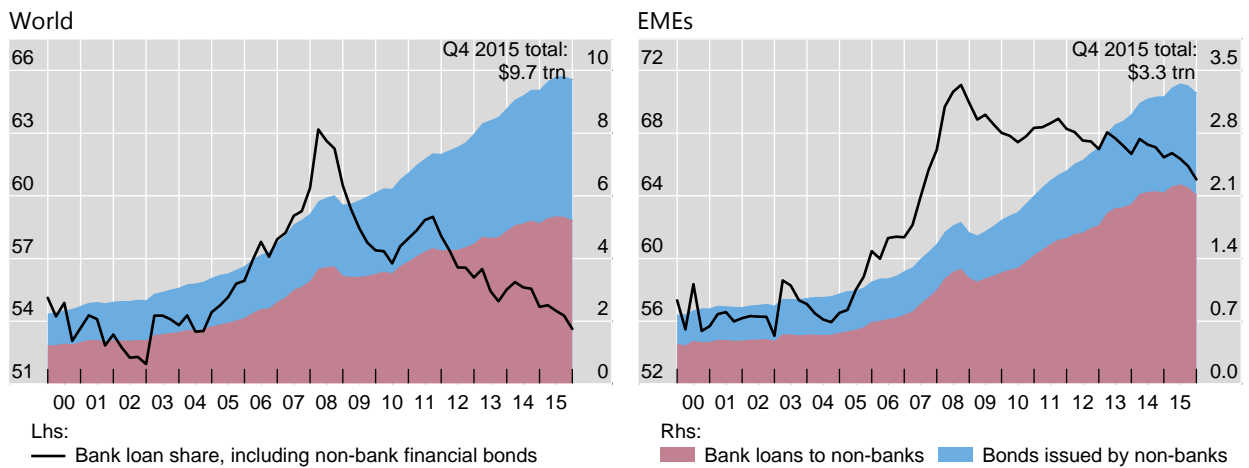
<sup>1</sup> Country-specific dollar-zone weights plotted against the share of bank deposits, bank loans and resident's debt securities in the corresponding foreign currency totals, 2014. Includes the public sector. <sup>2</sup> Average over four years.

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

### Dollar-denominated credit to non-banks outside the United States surges<sup>1</sup>

Amounts outstanding, in trillions of US dollars

Graph 6



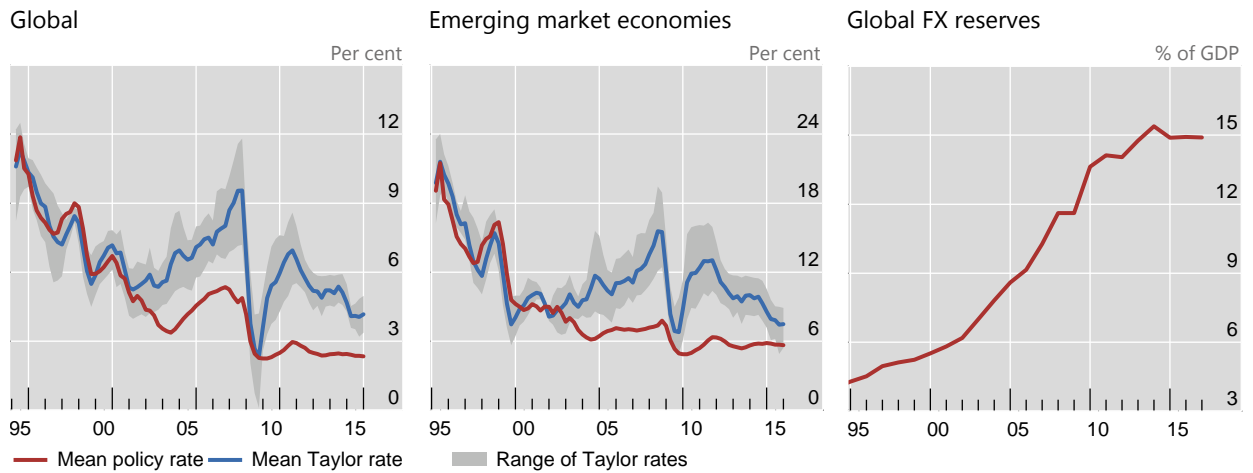
<sup>1</sup> Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. <sup>2</sup> Loans by LBS-reporting banks to non-bank borrowers, including non-bank financial entities, comprise cross-border plus local loans. For countries that are not LBS-reporting countries, local loans in USD are estimated as follows: for China, local loans in foreign currencies are from national data and are assumed to comprise 80% USD; for other non-reporting countries, local loans to non-banks are set equal to LBS-reporting banks' cross-border loans to banks in the country (denominated in USD), on the assumption that these funds are onlent to non-banks.

Sources: Datastream; BIS debt securities statistics; BIS locational banking statistics.



Very accommodative global monetary conditions<sup>1</sup>

Graph 7



The Taylor rates are calculated as  $i = r^* + \pi^* + 1.5(\pi - \pi^*) + 0.5y$ , where  $\pi$  is a measure of inflation,  $y$  is a measure of the output gap,  $\pi^*$  is the inflation target and  $r^*$  is the long-run real interest rate, here proxied by real trend output growth. The graph shows the mean and the range of the Taylor rates of different inflation/output gap combinations, obtained by combining four measures of inflation (headline, core, GDP deflator and consensus headline forecasts) with four measures of the output gap (obtained using Hodrick-Prescott (HP) filter, segmented linear trend and unobserved components techniques, and IMF estimates).  $\pi^*$  is set equal to the official inflation target/objective, and otherwise to the sample average or trend inflation estimated through a standard HP filter. See B Hofmann and B Bogdanova, "Taylor rules and monetary policy: a global 'Great Deviation'?", *BIS Quarterly Review*, September 2012, pp 37–49.

<sup>1</sup> Weighted averages based on 2005 PPP weights. "Global" comprises all economies listed here. Advanced economies: Australia, Canada, Denmark, the euro area, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States. EMEs: Argentina, Brazil, Chile, China, Chinese Taipei, Colombia, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Singapore, South Africa and Thailand.

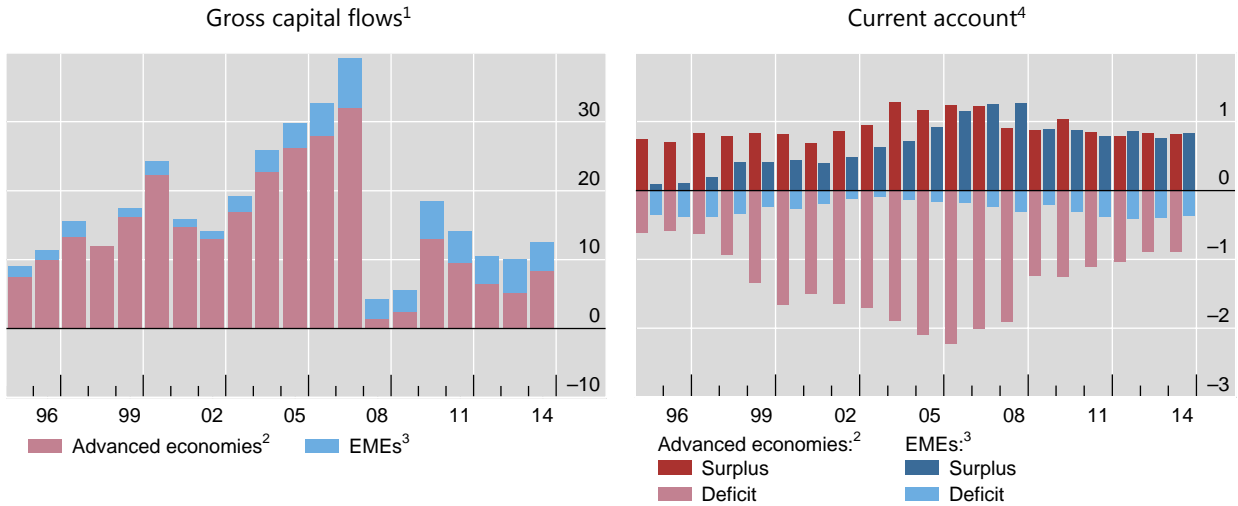
Sources: IMF, *International Financial Statistics* and *World Economic Outlook*; Bloomberg; CEIC; Consensus Economics; Datastream; national data; BIS calculations.



### Gross capital flows dwarf current account balances

As a percentage of world GDP

Graph 8



<sup>1</sup> Gross flows equal the sum of inflows and outflows of direct, portfolio and other investments and change in reserve assets. <sup>2</sup> Australia, Canada, Denmark, the euro area, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States. <sup>3</sup> Emerging Asia: China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. Latin America: Argentina, Brazil, Chile, Colombia, Mexico and Peru. Other: the Czech Republic, Hungary, Poland, Russia, Saudi Arabia, South Africa and Turkey. <sup>4</sup> Both advanced and emerging market economies are sorted into surplus or deficit each by the signs (positive or negative, respectively) of their current account balances.

Source: IMF, *World Economic Outlook*.