



Robert Triffin International

A watch on the international financial and monetary system

Managing Global Liquidity as a Global Public Good

A report of an RTI Working Party chaired by Bernard Snoy

Draft of 11 October 2019

Introduction

2019 is an opportune time to review the international policy frameworks for managing global liquidity. The risk of an unexpected and unplanned reversal of abundant global liquidity hangs over the world economy. There has been no shortage of warnings about an impending systemic crisis ((Hannoun-Dittus (2017), White (2016)). When the major economies were in the midst of a severe recession, the macroeconomic and financial risks of creating official liquidity on a large scale were small. And regulation was being significantly tightened after the Global Financial Crisis (GFC) lowering the risks of excessive liquidity creation by banks (Turner (2017)). The US economy, however, is now close to full employment, and the other major economies no longer face the threat of deflation but economic forecasts generally anticipate a world economic slowdown

It is also opportune because the cumulative balance sheet effects worldwide of low interest rates and quantitative easing for so many years in the key reserve currencies have become very large. That such spillovers to global liquidity conditions could generate macroeconomic instability worldwide was one of Triffin's key insights (Ghymers (2017)). Global liquidity (in the sense of foreign currency credit) has now risen to well above pre-GFC levels. Dollar exposures have risen faster than other foreign currency exposures. Most of this expansion has gone through bond markets as banks, which had expanded foreign currency exposures too recklessly before the financial crisis, have pulled back. The large and rapid rise of international financial intermediation through bond markets has created many new, and very opaque, risks. Many new issuers without good credit records have been able to float bonds in global capital markets.

Much of these issues would be illiquid in a less benign environment, and demand would fall once risk-free interest rates rise. The process has been helped by bond funds: they buy illiquid and high-yielding paper but quote daily prices to provide liquidity assurance ("liquidity illusion") to investors. Some recent episodes of runs on funds suggest that regulators have acquiesced in non-transparent liquidity and other risk exposures.

In a sharp downturn, which currently cannot be excluded according to the most recent forecasts, liquidity conditions tend to deteriorate. A financial

shock can make this worse. Central banks can counter this in their own currencies but not in foreign currencies. The Fed's LOLR powers have been curtailed by the financial reforms put in place after the crisis (Geithner 2016). Nevertheless, swap arrangements with six major foreign central banks were made permanent after the GFC and would allow the Fed to lend dollars on an unlimited scale¹. Such arrangements provide the world economy with its most important backstop in the event of a dollar liquidity crunch. Providing dollar liquidity to foreign central banks, however, has often attracted hostile comment in the US legislative branch.

IMF financial capacities have not kept pace with the growth of international financial markets. Villeroy de Galhau (2019) noted that the global financial safety net is too small and imperfect in coverage. He quoted a special ECB (2018) study: total IMF resources have dropped from about 4% of global external liabilities in 1980 to less than 1% in recent years. The IMF is not in a position to function as an international LOLR. Failure to counter promptly a dollar liquidity squeeze in the next downturn could aggravate recession and leave the financial system weaker.

1. The Triffin heritage and the G20

The intuitions drawn from the intellectual heritage of Robert Triffin helped to understand better the systemic flaws in current international monetary arrangements. Padoa-Schioppa (2010) launched the *Triffin 21 Initiative* to explore such flaws. The recommendations formulated in the Report of the high-level Palais Royal Initiative (PRI) of 2011 inform our global perspective. The different elements of Triffin's work are related to many key themes in this Report (Snoy (2019) etc)). These elements have recently attracted greater attention in several forums dedicated to international monetary co-operation, especially on the occasion of the 75th anniversary of the Bretton Woods agreement. See, for example, Villeroy de Galhau (2019) and Wolf (2019), who reviews the current major threats to international monetary co-operation.

¹ The central banks are the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank, the Federal Reserve and the Swiss National Bank.

Four fundamental dimensions of international monetary co-operation have a lasting interest:

- a) Adequacy of international reserves;
- b) Avoidance of cumulative balance of payments disequilibria which could strain international financing mechanism;
- c) Confidence in reserve assets; and
- d) Need for a global lender of last resort to cope with liquidity shocks and for managing global liquidity in the interest of the global community.

Today the specific manifestations of these four dimensions are quite different than in Triffin's era. The issue of the *adequacy of international reserves* has been altered by exchange rate flexibility and free capital movements. The supply of international liquidity – by the private sector – has responded in a very elastic way to the growth of international trade and the dramatic surge of capital movements. This very elasticity may have created financial and macroeconomic risks. The dollar remains pre-eminent but we can observe the increasing importance of the RMB (and its incorporation in the SDR) and the wider use of bilateral central bank swap lines for non-dollar currencies. If, however, central banks use such swap lines to quickly exchange the foreign currency received for dollars, this may create unwanted pressures on the non-dollar currency initially received (Iwata (2018)).

Large balance of payments disequilibria have lasted far longer than believed possible in the 1970s. They remain a major unresolved problem. At a recent G7 conference, Villeroy de Galhau (2019) noted that global imbalances – measured by the sum of the absolute values of net creditor and debtor positions imbalances – have now reached 40% of world GDP, an historical peak and four times larger than in the 1990s. The need for some symmetry in adjustment between creditors and debtors was stressed by several contributors to the PRI². It has been on the agenda for international monetary reform since the Committee of Twenty in 1974. Repeated calls for stronger

² Aglietta, Mateos y Lago (with other IMF economists), Truman and Reddy (in Boorman and Icard editors (2011)). Historically, the refusal of surplus countries to adjust their own policies to help correct imbalances has led to defaults on their claims on deficit countries (Turner (2013)).

multilateral surveillance to reduce international payment imbalances has led to the adoption of many procedures both globally (IMF, OECD) and regionally (the European Union's Macroeconomic Imbalance Procedure). But effective mechanisms to correct persistent external surpluses have proved elusive.

The question of *confidence in reserve assets* has in recent years become a question of the supply of safe and liquid assets. Government bonds of "safe" sovereigns are the classic safe asset, and fulfil a role akin to money. The ultimate safe asset remains US Treasuries³. In the years before the GFC, the markets had created riskier alternative dollar assets, rated as AAA. Banks could hold such paper free of a capital charge and would accept them as collateral. The demand for safe collateral inevitably increases as financial intermediation shifts from banks to capital markets. The Triffin dilemma dimension is that countries need to run fiscal deficits to ensure the necessary supply of government bonds. But larger fiscal deficits can undermine the perceived safety of their debt.

Some recent and proposed international initiatives could facilitate the selective default of government bonds as part of an adjustment programme. But policies which seek to inject a degree of riskiness into government debt involve many dangers. Anything which undermines the standing of government debt would damage the local banking system, accentuate liquidity stress and make it harder for a central bank to manage a financial crisis or a macroeconomic shock (Saccomanni (2018)).

When it becomes necessary to *cope with liquidity shocks*, it is only *unconditional* liquidity that can be seen as a genuine substitute for forex reserves. This has become a black-and-white distinction even if current instruments for international liquidity assistance embody a continuum between conditional and unconditional.

³ The bonds of some euro area countries also have a similar safe status. Measured by share of outstanding sovereign debt held by foreign central banks, the "safe euro area aggregate" (that is, of Germany, France, the Netherlands and Austria) has already reached the level of the dollar (chart 23 in ECB (2019)). The ECB's annual report on the international use of the euro concluded that the stronger international use of the euro depended on having a larger supply of safe assets, perhaps through a "common euro area safe asset ... in a way that does not undermine incentives for sound fiscal policies ... with the indirect benefit of sharing the advantages more widely across euro area sovereigns."

The high-level PRI in February 2011 was driven by the realisation that “seemingly appropriate liquidity conditions in individual economies may add up to excesses or shortages internationally”. Three main policy proposals were:

- i. National macroprudential policies should take account of global liquidity conditions;
- ii. Capital flows are key in the transmission of risks, and hence need to be managed;
- iii. Need for some permanent financing mechanisms that, in a crisis, would act like a global LOLR. The RTI Working Party “Using the SDR as a lever to reform the International Monetary System” chaired by André Icard in 2013 explored how to get the SDR to play greater role in this connection. This Working Party examined what might be done to develop private markets in the SDR. Transforming the present SDR into a genuine world currency, by allowing the IMF to issue (or withdraw) the desired amounts of SDRs, remains an ideal solution.

2. Key dimensions of global liquidity

A major difficulty is that the term “global liquidity” is an allusive term. It captures what those in markets feel, and is regularly mentioned in the financial press. But it is not a definitive term. And it is not just the product of monetary policy – fiscal policy and regulatory policy also matter. The absence of a simple and unambiguous definition means that many indicators, including those of a microeconomic nature (e.g. on the specific sectors facing severe liquidity constraints), need to be assessed. The policy reaction function of the central bank to liquidity stresses in specific markets (e.g., money markets) is also crucial. Analysis is all the harder because the characteristics of liquidity are in principle distinct but can become closely linked during a crisis.

The PRI report suggested that the IMF and the BIS should work together to develop a set of indicators based on adequate statistical tools to better measure global liquidity. Central Bank Governors meeting at the BIS asked the Committee on the Global Financial System (CGFS) to investigate the measurement, drivers and policy implications of global liquidity. The result was the Landau Report, published in November 2011 (BIS (2011)).

This report underlined that the main driver of global liquidity had become international financial markets, subject to policies in both the monetary and the regulatory spheres. It noted that, “the concept of global liquidity continues to be used in a variety of ways and this ambiguity can lead to unfounded and potentially destabilising policy initiatives.” The analysis in the report started from the distinction between the official components and the private components of global liquidity.

(a) The official component

A key question is how central banks exercise their domestic LOLR policies in a crisis. During the GFC, private liquidity had contracted in a severe and protracted Global Liquidity Freeze. To give just one number: global interbank claims fell from \$9 trillion in early 2008 to less than \$6 trillion by the end of 2009 (Domanski and Turner (2011)). Many markets became illiquid. With hindsight, central banks (and governments) during the early phases of the GFC failed to recognise that the loss of international confidence in the viability of many large banks would provoke a severe global recession. Short-term liquidity assistance in domestic currency to local banks could not meet this threat.

The surge in the demand for liquid assets was global, and it was for dollar assets. This international dimension was accentuated by the fact that many non-US banks had built up large short-term dollar liabilities. Many monetary authorities (government plus the central bank) responded by themselves accumulating additional liquid assets, thus adding to the demand for liquid dollar assets (Allen (2013)).

Eventually, action to ease this global liquidity shortage was led by the Federal Reserve and supported by other reserves-issuing central banks. Graph N° 1 shows the sizes central bank balance sheets relative to GDP – perhaps the one measure of official liquidity easy to compute for all central banks⁴. Between 2008 and 2014, the Fed was expansive while the ECB was restrictive. From 2014, this position reversed. By early 2019, the ECB’s balance sheet was,

⁴ Other dimensions also matter. Buying assets of long maturity or of higher credit risk is more expansionary than buying, say, 3-month Treasury bills which has little significance.

measured relative to GDP, twice as large as that of the Federal Reserve. The EMEs' balance sheet was in aggregate rather stable.

The decisive role played by swap arrangements between central banks during the crisis confirmed that only central banks can provide an elastic supply of foreign currency liquidity on a scale large enough to dominate financial market expectations. The Fed's swap lines with 14 central banks, who then provided dollar credits to their banks peaked at just below \$600 billion. By forestalling even heavier dollar borrowing by foreign banks in US markets, which would have pushed dollar rates higher when the Fed was seeking to lower such rates, the swap lines served the objectives of US monetary policy.

Nevertheless, these swap lines attracted strong but ill-informed political criticism within the United States. Since the GFC, US regulators have paid more attention to the dollar exposures of non-US banks. The warning by Geithner (2016) in his Per Jacobsson lecture that the Dodd-Frank Act has constrained the LOLR powers of the Fed is a sobering one.

The issue of the management liquidity shortages which straddle national borders by the central banking community was addressed by the Nakaso Report on "Designing Frameworks for central bank liquidity assistance" (BIS (2017)). This report focuses on cross-border dimensions of the central banks' liquidity support and spells out specific issues that have to be dealt with before the next crisis. Many of the issues identified remain unsolved.

Nakaso (2018) identifies three key quandaries:

- i. Firepower needed to address liquidity shortages affecting several jurisdictions simultaneously
- ii. Trap of transparency: simultaneous disclosure of liquidity support to all counterparties could be counter-productive
- iii. Capital market intermediation: limits on what assets CBs could buy or accept as eligible collateral: e.g., bonds issued by foreigners? non-dollar assets?

(b) The private component

The Landau Report demonstrates that private liquidity is now considerably larger than official liquidity. The increasing trend in global liquidity is a result of deeper financial integration between countries and

financial innovation (spurred, among other things, by regulatory changes). The Report notes that the creation and destruction of private liquidity is closely related to leveraging and deleveraging by private institutions. The dynamics of gross international capital flows, including cross-border banking or portfolio movements, are linked to private liquidity. Such flows can create currency mismatches and increased maturity exposures, features that have been key in several financial crises in the emerging markets.

Private liquidity is also highly cyclical because it is driven by divergences in growth rates and in domestic financial and monetary conditions. Movements in risk appetite are crucial.

The Report discusses three possible policy responses which should aim to counter both excesses and shortages in the supply of global liquidity.

First is the regulatory framework. The post-GFC strengthening of financial regulations has made global banks better able to counter liquidity shocks and more resilient more generally. But there are two qualifications to this optimistic assessment.

One is that when market liquidity is abundant, banks should build up liquidity buffers which they can and should draw down when markets go through temporary periods of illiquidity. Regulations which require banks to maintaining high liquidity ratios irrespective of swings in market liquidity and the business cycle fail to do this (Landau (2018)). How regulators seek to make their liquidity rules more responsive to circumstances deserves closely watching.

The other qualification is that capital market intermediation has grown relative to bank-based intermediation since the GFC. As discussed in Section 4 below, this has given rise to new vulnerabilities: poor credit and liquidity risk pricing; weaknesses in non-bank intermediaries; market practices and infrastructure.

Second is the role of domestic policies. Foreign exchange intervention policies and monetary policies can help countries mitigate the impact of financial shocks from abroad.

Building up reserves can help countries insure themselves against liquidity shocks. The Landau Report noted that reserves are built up for many

reasons: insuring against a run on domestic financial systems; providing foreign currency liquidity to local companies and financial institutions; and influencing market sentiment and risk premia. These same reasons may also explain the fear of losing reserves in times of stress – exactly when reserves should in theory be used. This underlines the need to identify other sources of foreign currency liquidity.

Reserves may also accumulate as a result of intervention in foreign exchange markets to offset swings in capital inflows. Recent research has indeed focused on the macroprudential function of such intervention (Kim and Lee (2017), Agénor and Pereira da Silva (2019)). Such intervention can keep the exchange rate away from extreme values. Building up reserves provides ammunition that can be used to counter too-sudden or excessive appreciation.

There is no consensus on whether the costs of building reserves are in general too high, because differences in individual country circumstances (notably the credit spread a government borrowing foreign currency would have to pay). Up to now, the reserves-issuing central banks have generally avoided targeting exchange rates: Villeroy de Galhau (2019) suggests that this stance helps to explain the “fruitful paradox of recent years – the co-existence of domestically focussed monetary policies that result in a globally competitive monetary environment.”

Deeper local financial markets in many emerging market economies have helped them to better withstand liquidity shocks. In addition, more extensive local markets give central banks greater scope for using balance sheet policies to meet macroeconomic objectives in the face of volatile capital flows (Gagnon and Turner (2018)).

The third is LOLR policies. Only central banks can intervene in the very large, even unlimited way, required by a liquidity shock. As liquidity evaporates across market segments, the line between solvency and liquidity becomes blurred and the Treasury almost inevitably gets involved. The forensic account of Ball (2018) of the US Treasury policy mistakes on the failure of Lehman brothers is telling on this point. The international dimension brings added complexity.

(c) Easier monetary policy and tighter bank regulation: the surge of market intermediation

The central bank balance sheet provides liquidity domestically. Monetary policy in the advanced economies since the GFC has been very expansionary with policy rates near zero (or even negative) for years, the size of central bank balance sheets rising substantially relative to GDP (see Graph N°1) and central banks assuming greater risk exposures.

At the same time, there was a major tightening of bank regulation worldwide. For the first time, liquidity rules were incorporated in the international agreements on bank regulation. Given this, monetary expansion helped to strengthen the financial system – because higher real incomes limited bankruptcies and because higher asset prices not only helped debtors to reduce their leverage but also made it easier for banks to reduce their NPLs.

The net effect of easier monetary policy but tighter bank regulation was to constrain the expansion of bank credit to the private sector which, given the pre-GFC excesses, was inevitable. But the scale and the modalities of such restrictions remains a matter of debate. For instance, during our meetings a banker argued that maturity transformation by banks in the euro area (now focused on reducing risk in their lending) had been reversed, with banks borrowing medium-term from the ECB and lending short-term. This has hurt SMEs which depend on bank loans.

Larger firms which have been able to access capital markets took advantage of the exceptionally low long-term interest rates. The shift in international financial intermediation from bank loans to capital markets has changed the nature of global liquidity, creating new financial risks.

The radical changes in central bank balance sheets since the GFC (size, the longer maturity of assets and private risk exposures) are not likely to be unwound quickly. Major questions have appeared on the future use of the central bank balance sheet for monetary policy in both expansionary and contractionary directions. The range of tools used by central banks has increased significantly, and evaluating their effects (both short-term and long-term) will take time. There is a debate about how best to counter unintended side-effects, domestically and internationally.

The recent review by the Independent Evaluation Office (IEO) of IMF advice on unconventional monetary policy speaks to this debate. The IEO found that the Fund made the right call in supporting the radical expansion in the balance sheets of advanced economy central banks. The associated financial risks need to be contained by regulatory and macroprudential policies. The Fund was urged to be especially vigilant in monitoring such risks (IEO (2019)). A BIS report by central bankers (BIS (2019)) reached similar conclusions. Lowe (2019) provides a pithy summary, warning policy-makers not to overburden monetary policy, arguing that fiscal policy and macroprudential policies also have crucial roles to play. These broad conclusions are widely shared (Bean (2018), Carstens (2018)).

3. Quantity measures of global liquidity

Global liquidity is a complex notion and there is no agreement about how best to measure it. Several indicators have been put forward by the IMF and the BIS. The private sector has also developed and maintained measures of global liquidity (Ghymers (2019), Howell (2018)). Indeed, statistical coverage has significantly improved since 2011, when the PRI called for the building up of a statistical framework, however the two sets of official statistics differ in their approach and some important elements, especially those implying non-bank institutions which have become progressively very significant, are not fully captured.

The IMF's measure focuses on the sources of funding for banks, based on their liabilities, similarly to the way a central bank calculates its money supply aggregates. The IMF made these quantity indicators available to the Working Party but no longer publishes them. By contrast, the BIS measures international foreign currency credit to non-banks. It does this by measuring the loans of banks and outstanding international bond debt. Those statistics are published on a quarterly basis. Such duality of approach underlines the complexity and ambiguity of the notion "global liquidity". In many ways, the two sets of statistics complement each other and so allow a significant (if not exhaustive) diagnosis of the global monetary and financial situation.

(a) IMF statistics

IMF statistics divide the liabilities of banks into “core” (that is, what banks can rely upon in normal times, such as retail deposits) and “non-core”, that is borrowing in the wholesale market or directly from the central bank against collateral. Those indicators help to understand the origin of global liquidity and to clarify the transmission channel from major central banks monetary policy to global liquidity. “Non-core” liabilities are easier to expand when liquidity is abundant. Graph N°2 shows that in the years before the crisis, their reliance on non-core funding rose substantially making banks very vulnerable when the global flight to safe and liquid assets set in from mid-2007. After 2008, regulatory reforms and the market have forced the banks to be more conservative in their funding. Hence the ratio of core to non-core liabilities has risen. Graph N°3 shows that core liquidity has risen as a % of GDP in the US, the euro area and Japan. This suggests that banks are less vulnerable to a sudden flight to liquid assets than they were before the crisis.

Note, however, a couple of caveats to this assessment. The first is that banks in many jurisdictions still rely quite heavily on capital market activities. Some own asset management companies. The second is that the euro area position looks stronger than it really is because of the LTRO lending by the ECB gives banks longer-dated liabilities and so reduces their reliance on short-term wholesale markets.

Non-core funding as a % of GDP has also fallen in the United States and the euro area but it has increased in Japan.

In 2012, the IMF also developed price indicators of liquidity which allowed the detection of potential tensions especially in global wholesale markets (Chen and al (2012)). For instance, this indicator of non-core liquidity price – that is, in wholesale markets – rose by steadily from mid-2007 until the end of 2008, when it had reached 5 standard deviations above normal. During those 18 months, neither central banks nor the IMF fully digested the need for urgent action to counter this severe and prolonged international liquidity squeeze.

The division of liabilities into core and non-core gives an indicator of financial risks since the growth of non-core liabilities is driven by the increase leverage of financial firms. By combining quantity with price measures, the IMF

could be in a position to distinguish supply and demand shocks to global liquidity

(b) BIS statistics

Graph N°4 shows the BIS's measure of global liquidity – foreign currency credit to non-resident non-banks. This includes borrowing via bond markets as well as from banks. The lower panel shows the aggregate for all currencies, and for the past 5 years this has been growing at about 5% a year. The top panel shows that the growth of dollar lending dominated until 2014, but has recently slowed while that of euro lending has risen. The BIS aggregate could equally be described as an indicator of gross foreign currency exposures – gross because no account is taken of foreign currency assets, which is necessary to measure currency mismatches. Section 4 below looks at measures of currency mismatches that rely heavily on BIS's banking and bond data.

Although the BIS aggregate includes debt of all maturities (not just short-term liabilities more relevant for measuring liquidity), the underlying bond data include dates of maturity. In principle, therefore, the foreign currency bond debt falling due over the subsequent 12 months can be calculated. During recent EME crises, this key indicator of near-term liquidity risks was regularly calculated for countries under pressure.

BIS's statistics also provide data on the currency composition of international bonds. During the past 15 years, the proportion of outstanding bonds denominated in dollars has risen substantially while that in euros has declined. Since 2018, issuance in euros by non-euro area entities has risen relative to dollar issuance to non-US entities.

BIS's banking statistics also permit the estimation of the dependence of international banks in foreign currency funding (mainly dollars). Banks outside the United States currently have dollar debts of \$14-15 trillion – which exceeds the total liabilities of banks operating within the United States. There is therefore what Cecchetti and Schoenholz (2014) have called a Global Dollar system which grew rapidly before the GFC and has since stabilised at a high level.

Graph N°5 illustrates how international credit as a % of world GDP has evolved. By 2019 Q1, US dollar credit to non-banks outside the United States

had reached \$11.8 trillion, about 14% of world GDP – up from 10% of world GDP in 2007. Note that the share of dollar debt rose from 2010/2011 to the end of 2015 but has since stabilised. Bond debt (dotted line) has now overtaken that of bank lending. The lower panel shows this bond market/bank loan split more clearly. The big rise in the share of banks before the crisis is now seen as reflecting lax regulation which allowed the banks to increase their leverage on their equity capital and to rely more on wholesale markets. One of the objectives of post-GFC regulation, therefore, was to curb the banks and get more borrowing done in capital markets. The post-crisis decline in the share of bank loans based on data on international bank loans and on international debt securities was what the regulators intended.

BIS indicators also allow an easy comparison between the outstanding stock of international credit and the capacity of international support to maintain an adequate level of liquidity in situation of stress.

For now, the private component of global liquidity as measured by the BIS amounts to about \$11.8 trillion. Official liquidity includes IMF quotas (\$634bn), drawing capacities on liquid assistance procedures such as IMF borrowing resources (\$662bn), regional safety nets (Chiang Mai Initiative-\$240bn and European Stability Mechanism-\$500bn), and central banks discretionary swap assistance on an ad hoc basis (in 2008, the US FED swapped \$583 billion against currency deposits by other central banks in search of liquidity in dollars). Official reserves should also be taken into account (\$5 trillion – including gold – owned by the main EMEs; 2/3 belonging to China). As the 2008 experience shows that the supply of private liquidity cannot be relied upon in period of stress, the comparison of the two components indicates that the capacity of international support to accommodate a liquidity shortage looks limited to about 1/5 of the outstanding of international credits and loans, if one take in account that national official reserve assets can hardly be considered as set aside for international cooperation and that regional agreements are designed to deal with crisis in a small group of countries and are not appropriate for global liquidity risks.

The quantitative dominance of private global liquidity in normal times makes global liquidity very fragile in time of stress. Unless strong decisions are taken to develop official safety nets, for instance by granting the IMF a

capacity akin to the one of an international LOLR, the stability of the system will continue to be fragile.

4. Currency and maturity mismatches

Almost all past crises in the emerging markets have been aggravated by currency and forex mismatches. Such mismatches are multidimensional, and the IMF and the BIS have developed statistical indicators. A currency mismatch between domestic and foreign currencies arises whenever an entity's balance sheet or net income is sensitive to changes in the exchange rate. But a currency mismatch can also arise from a change in the exchange rate between third currencies. Because the share of debt denominated in dollars is usually larger than the share of trade with the United States (or dollar-based economies), a rise in the dollar tends to be deflationary in countries with large dollar debts. The much-increased use of the dollar, and the reduced use of the euro for borrowing by entities outside these currency areas has increased currency mismatches. The maturity of foreign currency debt also matters, with shorter-dated debt making the borrower more exposed to re-financing risk

Chui et al (2015) explain how increased global liquidity has created new – and in many ways more dangerous – dimensions to currency mismatches. Graph N°6 is based in currency mismatch calculations prepared at the BIS based on national statistics and the BIS's banking and bond data. The novel feature of these estimates is that they separate the country's total position into its official and non-official components.

This graph shows net foreign currency assets – that is the balance between foreign currency assets and foreign currency liabilities – as a percentage of exports. The dotted red line shows this for the country as a whole. This is now positive, not negative as it was in the late-1990s, but has declined somewhat since 2009. This means that the country's balance sheet improves when the currency depreciates. This is stabilising with respect to exchange rate shocks.

But the positive foreign currency asset position mainly reflects a big rise in official forex reserves. In sharp contrast, the private sector now has a large and rising net liability position in foreign currencies. For an aggregate of medium-sized EMEs (Group A countries in the graph), it is now around 40% of

annual exports – compared with 10% in 2005. It has been the increased bond issuance by EME companies which has been the main driver of this increase in liabilities.

Companies with dollar debts without the natural hedge of dollar earnings can create destabilising market dynamics that would not usually occur when the dollar debt is held by governments. By buying dollars at times of pressure in forex markets, companies can add to the downward pressure on the local currency. A lower exchange rate makes their debts even harder to service and may further reinforce dollar purchases (Chui et al (2016)). The local banking system is often also affected: companies which find it harder to borrow foreign currency cut their wholesale local bank deposits (Turner (2014)). There is also evidence that firms with dollar debts cut business investment (Avdjiev et al (2019)). A currency crisis often goes hand-in-hand with a bond market crisis and foreign investors, aware that the risks they face from currency depreciation and a fall in bond markets are multiplicative, pull out. There is thus a new risk factor for foreign investors (Carstens and Shin (2019)).

The IMF has long urged countries to improve their reporting of the currency denomination of assets and liabilities for the IMF's international investment position (IMF (2014)). The IMF is close to completing a dataset on currency mismatches. Foreign currency contracts between residents are also relevant (notably via domestic banks) in assessing forex exposures. In recent years, an increasing number of central banks (or supervisory agencies) publish data on the deposits and loans of domestic banks. Continued progress in improving currency mismatch estimates at the international level is important.

5. Global liquidity and long-term interest rates

International bond markets have become more important than short-term bank lending in the evolution of global liquidity and its transmission internationally in the post-GFC period. It is in world bond markets that the rise in global liquidity has been most felt. This suggests that global liquidity and the long-term interest rate are closely linked. The simplest exposition of the link is that of Keynes's liquidity preference theory. His insight was that shifts in the private sector's willingness to assume liquidity and maturity risks that could move the long-term rate even when other macroeconomic variables did not

change. Keynes believed that the future path of the long-term rate was unknowable (radically uncertain) so subjective factors dominated liquidity preference. If the private sector became more nervous and wanted more liquid assets (and assuming no change in short-term rates), bond prices would fall. Hence in his model shifts in liquidity preference get reflected in the long-term rate. Given arbitrage between bond markets in different currencies, long-term rates are determined in world markets. This helps to explain why, since the Fed began to tighten, the 10-year US Treasury yield showed no little obvious trend: in particular, low or even negative euro yields have held down dollar yields (Graph N°7).

Hence it makes sense to talk about a “world” long-term rate as one price indicator of global liquidity. What determines this rate is much debated and over the past 10 years there have been big errors in consensus forecasts of this rate. There is no consensus on the relative importance of the three factors commonly cited. Structural features such as population ageing, changes in technology have raised the propensity to save or lowered real investments, and so depressed the long-term rate. Regulation has increased the demand for bonds (Ramaswamy and Turner (2018)). And long-rates worldwide have in addition been depressed by the expansion of central bank balance sheets in all the reserves-issuing countries. Long-term interest rates in the major currencies remain well below the average of expected future short-term rates. As Graph N°8 indicates, the term premium in 10-year dollar and core euro area bonds is still negative. This is unusual historically, and is a key indicator of very abundant global liquidity conditions. The term premium includes an inflation risk premium, a real interest rate premium and a liquidity risk premium.

It is not hard to think of reasons for thinking that the term premium might snap back to positive territory, and portfolios of very long-dated bonds are vulnerable to such a snap-back risk. A recent survey of the concerns of financial institutions in Japan (banks, life insurance companies and pension funds), for instance, revealed that one major concern related to Basel III was interest rate risk in the banking book (Sugeno and Sugeno (2019)). Investment products directly affected by this were Japanese government bonds and investment trusts (invested in portfolios of bonds). The increased weight of real estate investment trusts (REITs) in the assets of pension funds was noted.

Recent research on spillovers from post-GFC monetary expansion in the advanced economies on the EMEs has focused on transmission via long-term rates with short-term rates playing a much weaker role. The evidence is that domestic bond markets – in emerging market economies as well as advanced economies – have become more closely linked internationally. This has major implications for monetary policy dilemmas faced by these countries (see section 7 below).

There is great uncertainty about where are long-term interest rates headed in the medium-term. The larger outstanding stock of bonds on the balance sheets of investors and their longer average maturity has greatly increased interest rate risk in the financial system. This has increased the risk of an outsized reaction by investors to quite small changes in interest rate expectations. EME financial markets seem to have been hit by such an effect in 2018.

One market consequence of a tightening in global liquidity conditions could be a sudden rise in long-term interest rates. To analyse the implications of alternative interest rate paths for banks, insurance companies and pension funds, a BIS-CGFS working group led by the ECB and the Federal Reserve coordinated joint scenario analyses by all the major central banks (BIS (2018)). It laid out three scenarios for possible interest rate paths for all the currencies of major advanced economies and for many of the currencies of EMEs.

Focusing on the 10-year US treasuries interest rate by 2027, the broad conclusion is that in the **interest rate snap-back scenario** (end point at 6,2%), Banks (which generally hold more long-dated bonds on their balance sheets than before the GFC) would be hard hit. In the alternative **low-for-long scenario** where long-term rates would remain low for years (end point at 2,4%), held down by strong structural forces such as population ageing and slower productivity growth, some insurance companies and pension funds would face insolvency. The intermediary scenario called **baseline scenario** (end point at 4.8%) would result in a more acceptable smooth portfolio rebalancing out of long term assets and a repricing of credit risks. In the years to come evolutions of long term rates which will strongly depend on monetary policy decisions will be very influential on the conditions for financial stability.

6. The post-GFC explosion in bond issuance

The lower panel of Graph N°5 shows that there has been a substantial shift in the share of dollar-denominated credit to non-banks outside the United States since the GFC. With low (even negative) long-term interest rates (and a negative term premium) on benchmark bonds, many companies have found it attractive to issue debt and investors have taken more risk to get returns. Dollar bonds issued by non-banks outside the United States amounted to just over \$2 trillion in 2007. The amount now is \$6 trillion.

This has been a global phenomenon. The pace of annual corporate bond issuance has doubled from its pre-crisis average. A review in the latest *Economic Outlook* of the OECD identifies several major vulnerabilities. One is the risk of ratings downgrades. The share of BBB-rated bonds (one notch above high-yield or junk status) is now 54% of the global investment grade corporate bond market. In normal times, 4% of BBB bonds are downgraded over a one-year horizon; but in a recession, this percentage rises sharply. This could create a “cliff-edge” effect because most corporate bond investors have a strict investment-grade mandate – especially among the fast-growing indexed mutual funds and exchange-traded funds (ETFs) – and be forced to sell.

A second vulnerability comes from the use of risky structured products. Floating-rate leveraged loans (typically with lower quality credits and weaker covenants than bonds) in the United States and Europe now exceed \$2 trillion, above the 2007 peak. Covenants have been diluted. Most of such loans are packaged into Collateralised Loan Obligations (CLOs) and sold to banks, investment funds and insurance companies. Investors worried about losses on bonds if long-term rates were to rise suddenly are being enticed by floating-rate rate returns.

The scale of the migration of liquidity creation from banks to other actors and markets risks creating new blind spots in the radar systems of those monitoring global liquidity. This also raises new questions about the quality of bank assets. Global banks have been very active on market segments which are risky and poorly monitored such as leveraged loans and CLOs. In its July 2019 Financial Stability Report, the Bank of England concluded that global banks are

exposed, in various forms, to more than half of the global leveraged loan and CLO markets.

The assets of non-bank financial companies such as mutual funds, exchange trade funds (ETF), insurance companies, pension funds, sovereign wealth funds and endowments etc (\$135 trillion according to McKinsey Global Institute (2018)) now exceed that of banks (\$127 trillion) in terms of assets. The knowledge of the level of risk imbedded in these assets is poor but it is significant. For instance, US retail mutual funds hold 19% of the \$1.5 trillion US leveraged loan market and almost the same proportion of the \$616 billion CLO market. There is an urgent need to extend the coverage of global liquidity indicators beyond the bond market already included in BIS statistics and to collect more granular data about the very risky leveraged loans and CLO markets. Who holds such instruments? And how do they manage their exposures? Tran (2019) analyses these questions in some detail.

A third vulnerability is that asset managers collectively suffer from liquidity illusion. They invest in instant access funds on which a daily price is posted. But the underlying assets of many of those funds are illiquid, and for many no daily price exists. European rules for “liquid” mutual funds (which offer a daily trading price) allow up to 10% to be held in less liquid assets. The governor of the Bank of England has said that many of these funds and “built on a lie.”

These major changes in bond market structure are likely to affect bond market dynamics. Investors may be more flight-prone once they think that interest rates are going to go up and that defaults may rise. Leveraged investors are especially prone to run. In stress conditions, bond markets may therefore become more volatile and less liquid.

The last crisis showed that banks had failed to prepare for a liquidity crisis – a failing the regulators have tried to fix. But they have not addressed liquidity and other risks in capital markets. During the past year or so, several instances of funds facing crises shared one common element: their investments in virtually non-tradable even unlisted paper. In each case, the firms involved pleaded they have been hit by temporary liquidity problems. In each case, the crisis deepened.

The danger is that contagion could spread illiquidity across the whole universe of high-risk bonds (EM corporates, high-yield paper in advanced economies etc). This could trigger distress sales across the asset management industry. Several policy options could be considered. The regulation of illiquid or unlisted assets in open-ended needs tightening. Macroprudential surveillance of maturity mismatches and leverage in non-banks needs to be stronger. Evidence that liquidity risk premia are being under- or over-priced by a large margin should lead regulators to react.

Special attention needs to be given to foreign currency liquidity risks – especially dollar debt. Ghymers (2019) has argued in a paper prepared for the Working Party that a liquidity pyramid based on too narrow US Treasuries is very unstable. “Dollar intermediation that lacks a clear LOLR,” recently warned the General Manager of the BIS, “is a vacuum that could create a problem,” (Hinge (2019)).

It is too early to know whether the sudden stress in \$ repo markets in September 2019 (which caught the Fed by surprise) reflects fundamental not just technical factors. Tran (2019), for example, points out that non-banks rely heavily on repos to fund portfolios of risky bonds. Illiquidity in bonds in such portfolios could increase the demand for financing in repo markets. The role of foreign commercial banks or even foreign central banks remains to be explored (Pozsar (2019)).

7. Capital flows, spillovers and macroprudential policies

Capital flows bring many benefits. If intermediation mechanisms work well, they should contribute to raising world potential output by ensuring that funds are invested where the returns are highest. Indeed, savings need to continue to flow from advanced economies to the emerging economies. The G20 Eminent Persons Group emphasized that “reforms to the international monetary system should enable developing countries to run sustainable current account deficits where they are fundamentally needed to achieve their growth potential.”

In this situation of durable balance of payment deficits, EME leaders should not to give too much credence to capital controls because they do not

really help to avoid a crisis while the uncertainty created by introducing controls which discriminate between residents and non-residents can lead foreign investors to require a higher risk premium for holding domestic assets.

Nevertheless, the greater convergence of long-term rates internationally aggravated the monetary policy dilemmas faced by emerging market economies. Local financial conditions in countries with free capital movements are inevitably shaped by global developments. Local banking systems can be hit by shifts in prices and liquidity in international banking and capital markets. New currency mismatches are likely to be created with local firms or households shift from local currency to foreign currency debt. Central banks in the emerging markets can still set their policy rate to meet domestic objectives. But now they must take greater account of how policy rate changes affect their bond markets, the exchange rate and their banks. A flexible exchange rate might help countries alleviate – but not eliminate – the disruptions to their economies from external financial shocks.

Before considering a possible role for policy in controlling capital movements, it should be recognised that capital flows to the emerging markets also react strongly to *domestic* developments, often in a stabilising way. Capital flows to the emerging markets tend to rise when they enjoy an edge over growth in the advanced economies (Clark et al (2019)). Commodity-exporting countries attract increased inflows when commodity prices rise. And almost all studies show that it is countries with weak fundamentals or internal political weaknesses which face the strongest outflows when sentiment in global financial markets deteriorates. There is no doubt that changes in the stance of US monetary policies can influence all this, but the direct links have not been as strong in the post-GFC period as they have been historically (Panel A, Graph N°9).

EMEs face particular difficulties when confronted with very volatile capital flows associated with risk-off/risk-on swings in global markets (Turner (2015)). More than a decade ago, the Mohan Report published by the BIS demonstrated that a laissez-faire approach to capital flows made little sense (BIS (2009)). There were strong grounds for prudential reasons to resist short-term debt inflows, especially those in foreign currency. In certain circumstances, forex intervention could be effective. Particular attention

should be given to risk-taking by banks and to opaque (often leveraged) products floated in capital markets.

The IMF, however, was in the past too rigid in adapting its policy vis-à-vis EMEs to a world of high capital mobility. Exchange rate intervention, higher forex reserves and capital flow measures (CFM) could be viewed as macroprudential tools aimed at financial stability. The long period of exceptionally low interest rates, especially at the long end where QE has had its greatest impact, could well entail damaging spillovers to EMEs. The advice of the current chairman of the CGFS at the BIS is clear echoes of CGFS a decade ago (BIS (2009)): “recipient countries need to manage capital flows in a way that is consistent with their own priorities and needs (Lowe (2019)).” A BIS report a decade ago echoed this policy orientation (BIS (2009)). In particular, it may be imprudent to take action only after a bout of heavy capital inflows has created large risks: pre-emptive action can in many circumstances be the more prudent course.

The Working Party supports the argument of the G20 Eminent Persons Group that the “Institutional View” of the IMF needs to evolve: the risks to financial stability from capital flows need to be better managed as countries move to the long-run goal of open capital accounts. The IEO echoed this recommendation and indeed noted that most countries welcomed the Fund’s willingness to depart from orthodoxy (see chapter 5 of IEO (2019b)). But it noted that some warn against any “open blessing” on CFMs. The IEO’s current review of capital flows is welcome and indeed very timely (IEO (2019c)).

The IMF already has all the elements to be the world’s Macroprudential Authority. On the international surveillance of risk, the G20 Eminent Persons Group proposed that the surveillance efforts of the IMF, FSB and the BIS should be integrated into a coherent global risk map – a proposal that the recent report by the Independent Evaluation Office of the IMF endorsed.

The group stresses that any such joint process of these three institutions “must avoid converging on a diluted consensus”. Tapping market views was also essential. Robust risk surveillance, it suggested, should incorporate non-official and contrarian views. The RTI might be able to provide views of this kind.

8. Managing global liquidity: a shared responsibility

There is no doubt that macroeconomic policies in the major reserve issuing countries are at the origin of private liquidity creation and credit extension. Given the international role of the dollar, it is especially the case for the US macroeconomic policy: Global liquidity will tend to rise when US budget deficits increase, boosting the supply of long term assets, or when the Federal Reserve lowers dollar rates; acquiescing more bank leverage would have a similar effect. One consequence, stressed by the PRI, is that *“seemingly appropriate liquidity conditions in individual economies may add up to excesses or shortfalls internationally”*. This remark lies at the centre of the “Triffin’s dilemma”. Preventing such a situation or mitigating its consequences would imply a collective and international monitoring of global liquidity so that national policies (monetary, fiscal or regulatory) can take into account this important international factor.

A big difficulty is that governments and parliaments have assigned to central banks mandates that are fully oriented to domestic objectives. This inevitably limits the room for any central bank acting alone to take account of international concerns. Apart from changing the laws governing major central banks, which is hard to imagine even at a medium-term horizon, the best way to circumvent the problem would be to enhance significantly international cooperation up to a point that taking into account the international environment would appear in conformity with national interests. This kind of cooperation would imply not just willingness within the central bank community but more a large degree of will at the political level. Indeed, it is difficult to imagine a big cooperative effort taking place within the central bank community while the spirit of multilateralism is clearly declining at the governmental level

Independent of the impact of major economies’ monetary policies on global liquidity, however, the monitoring of changes in private global liquidity is not exclusively in the hands of central banks. It is clear that the regulation of international financial institutions has a strong influence on liquidity conditions. International banks in particular have been requested to substantially increase their own holdings of liquid assets. This means that banks are induced to reduce the liquidity they provide to non-bank entities and

to capital markets in general. Hence regulators must also play their part in the management of global liquidity. Similarly, the control of international capital flows and exchange rates policies, which play a key role in the transmission mechanism from domestic monetary policies to international financial markets, and vice-versa, are more in the realm of Treasuries than of central banks.

Again, when considering safety nets, essential in time of financial stress, swap networks are made available by central banks, but IMF facilities play also a key role and decisions regarding them are relevant to Treasuries.

From this rapid review⁵, one can conclude that managing global liquidity requests the involvement of a number of official institutions: Central banks, Treasuries, regulatory bodies in addition to the IMF have a role to play as none of them has the means to manage global liquidity on its own, while each of them hold a certain degree of influence.

9. What international arrangements for managing of global liquidity?

Although the question of global liquidity is a frequent topic of discussion in financial market commentaries, because traders know that changes in market liquidity can have major implications, it surfaces only from time to time in the general economic debate, is rarely referred to in academic circles and is not systematically reviewed within the main official international policy forums.

Due to the significance of the issue, it is important that it appears on the agenda of top officials at international meetings, as a key element of the international economic situation, subject to a strict and regular surveillance. Finding an adequate channel for this step forward looks essential

(a) Global liquidity statistics

The PRI devoted a full chapter of its report to global liquidity at a time (2011) where it was neither clearly defined nor adequately measured. It

⁵ For a more detailed analysis of the influence central banks, regulatory authorities, Treasuries and the IMF can exert either on the supply of global liquidity or on its demand or on both of them see André Icard's contribution to the working party "Managing global liquidity" (September 2019)

suggested (suggestion N° 9) that the IMF and the BIS work together towards a shared analytical approach for a better measurement and surveillance.

In spite of the significant progress accomplished since 2011 in the statistical approach to global liquidity, more needs to be done. The major international institutions which combine macroeconomic and financial market expertise at the global level – BIS, IMF and OECD – should continue to strive to provide to the international community on a regular basis those indicators which facilitate the monitoring of risks from both liquidity feasts and liquidity famines.

The Working Party recommends that the IMF resumes publishing its series of core and non-core banks liabilities and update in view of publication its price indicators of liquidity. In the spirit of the PRI suggestion, the IMF and the BIS should then work together to complete information and analysis on the influence that non-banking institutions can exert on liquidity conditions at the global level, to provide indicators on currency mismatches, to produce a more coherent and comprehensive set of global liquidity indicators. These are indispensable elements of a much-needed “global risk map” called for by the EPG in October 2018 (G20 (2018)).

(b) A global perspective: scenarios and stress tests

Any purely national assessment of risks will fail to capture the true risks all would face in the event of a major global liquidity crunch. Increased risk aversion in the global financial system and a decline in foreign aggregate demand would generate powerful feedback effects that could overwhelm even countries with sound fundamentals.

Predicting in advance how such a global liquidity crisis would arise and its subsequent dynamics is impossible. For this reason, scenarios which allow for international financial linkages and feedbacks (such as the central bank exercise for long-term rates outlined in section 5) are essential. Stress tests based on a global liquidity shock would be invaluable. A recent paper of the IEO proposed that the IMF should conduct regular global liquidity stress tests (Jeanne (2018)).

The Working Party recommends that the IMF conduct and publish regular scenario analyses and stress tests for a global liquidity shocks.

(c) The international management of global liquidity

Regarding the management of global liquidity, the PRI envisaged (suggestion N° 10) a joint responsibility between the IMF, the BIS and the FSB and recognised the impact that exchange rate regimes, financial regulation and supervisory policies might have, in addition to monetary stances, on liquidity level and conditions: *The IMF, the BIS and the FSB should regularly monitor developments in global liquidity with a view toward formulating recommendations for all systemically relevant countries regarding the conduct of their policies (including monetary and exchange rate policies, as well as financial regulatory and supervisory policies) with a potential impact on global liquidity*". Furthermore, in its suggestion N° 11, the PRI suggested that the IMF establish a more complete analytic framework on capital flows and argued that *"The use of capital controls, subject to IMF surveillance under an amended Article V, (might) be warranted as an option to prevent disorderly exchange rate movements or financial instability"*. Indeed, from the start, the PRI had acknowledged that global liquidity trends were not exclusively influenced by monetary policies and that its management should be the result of a cooperative approach among international institutions.

The global liquidity management process should be adapted to the realities of the international monetary institutional framework. Our proposal, to be effective, should take into account the reality and the weaknesses of the current situation. But of course, in the future, other solutions could be envisaged as a part of an ambitious reform programme

It is in particular the case of Michel Camdessus and Anoop Singh's proposal aiming at a number of specific reforms aimed at tailoring the IMF's methods and instruments to today's problems and at strengthening its legitimacy and governance *"Reforming the IMS-A sequenced agenda (2014)*. This document confirms the importance of managing global liquidity as a global public good and proposes that a group of central bank governors-comprising those of the central banks whose currencies are included into the SDR- would be created in view of reporting periodically on global liquidity conditions to the IMF's International Monetary and Financial Committee (IMFC) whose role would previously be considerably enhanced to the point that it would become the ministerial organ of the G20, in charge inter alia of

calibrating global liquidity. This valuable suggestion is sensible but it cannot be immediately envisaged as it comes at the end of the “sequenced agenda”, which starts with a profound strengthening of IMF’s legitimacy and governance. Indeed the authors envisage first these structural and ambitious measures and “*preferably simultaneously or as a second step*” the ones related to global liquidity management. The second step cannot be envisaged independently from the first, especially in the present situation as the IMFC has no formal decision-making powers., and proposing the creation of a central banks governors group without any other significant reform has little chance to be considered.

Interestingly, four converging proposals have been made in the recent past, aiming at strengthening the International Monetary System by a significant development of the use of SDRs.

In 2015, a working party initiated by RTI proposed to use intensively the SDR, both public and private, as a lever to reform the IMS RTI (2015)). By this mean, the Triffin dilemma would be considerably reduced, a proper management of global liquidity could take place and the IMF could be able to become a real LOLR. John Williamson, who participated in this working party, confirmed these proposals in a subsequent book (Williamson (2016))

In July 2019, during the G7 conference organised by the Banque de France on the occasion of the 75th anniversary of the Bretton Woods agreements, Jean-Claude Trichet (2019) also proposed to strengthen the use of the SDR as a possible element of IMS reform.

Very recently, Joseph Gagnon (2019) suggested that the IMF (a) create a large volume of synthetic SDR bonds of various maturities backed by sovereign bonds denominated in the currencies of the SDR basket and (b) set up a payment system based on such bonds. These measures would make the IMS more symmetric.

All these proposals open interesting perspectives for the future, but only in a medium or long-term perspective. Due to the financial risks analysed in the previous sections, and the urgency to make progress, only a solution immediately applicable can be envisaged at this time, but it should pave the way for more ambitious reforms in the future.

(d) Looking for a pragmatic global liquidity management framework

First, one should admit, even though with regret, that in current circumstances the appropriate forum for discussing global liquidity topics on a regular basis and possibly managing it when needed would not be the IMF, unless it were to be profoundly reformed, but the G20 Finance Ministers and Central Bank Governors Group. During the Pittsburgh Summit (September 2009), leaders designated the G20 as “*the premier forum for our international economic cooperation*” with the objective to strengthen policy coordination, promote financial stability and modernize the international financial architecture. This Summit took place a few months after the one held in London (April 2009) where, as the world was confronted to a drastic liquidity crunch, the G20 decided a general allocation of SDRs equivalent to about \$250 billion which became effective in August 2009. An additional one-time allocation of SDR21.5 bn (\$34 bn) resulting from the Fourth Amendment to the IMF Articles became effective in September.

Second, an effective institutional arrangement for managing global liquidity would depend on a good statistical framework, central banks guidance and possibly action, input from Treasuries, the expertise of financial regulators and IMF support. These requirements suggest the need for a cooperative approach across international institutions, as indeed envisaged by the PRI.

The report of the Eminent Persons Group to the G20 (G20 (2018)) made a specific proposal that the **IMF, FSB and BIS should integrate their surveillance efforts to produce a global risk map**. Along similar lines, the recent report of the Independent Evaluation Office – IEO – of the IMF (IMF (2019)) recommended that the Fund’s work on multilateral financial surveillance should take greater advantage of working with international partners, noting in particular the need to intensify cooperation with the international regulatory agencies. The regular Early Warning Exercise, notably on financial and macro financial risks, produced by the IMF and the FSB is already highly influential. It appears that work has begun in the BIS, the FSB and the IMF on how to deepen and broaden this surveillance exercise. Regularly and systematically monitoring global liquidity should become a part of this important exercise. This may be especially needed in the years ahead as

monetary and financial conditions evolve to a “new normal”, the contours of which remain uncertain.

(e) A specific and public periodic report by the FSB

The Working Party proposes that in advance to the G20 Ministers and Governors meetings, the FSB would provide a report on the level, the nature and evolution of global liquidity, based on the enhanced statistics of the BIS and the IMF. The IEO report rightly stressed that such a joint exercise should not “compromise the Fund’s capacity to raise out of the box issues”. The same should apply to the BIS so that the two institutions, in addition to their statistical support, could complete the FSB report by their own comments by reference for instance to the global economic situation, to financial stability prospects or to the regulatory environment. It would be important to seek inputs from other official institutions with a global focus (such as the OECD) or with a relevant regional/technical expertise. This joint report would then be submitted to the Ministers and Governors for consideration and possible decision, and made public.

Such an approach would imply first a joint statistical effort by the IMF and the BIS but, this being done, it would be easy to implement as it would request no institutional measure, just the inclusion of a new item in the agenda. This would deepen and extend the debate on this topic and would help making global liquidity better known by decision-makers and analysts.

The EPG made a point of stressing that no one knew where the next crisis would start from. Hence it said that robust risk surveillance depended on the incorporation of non-official and contrarian views. It also underlined that the official international institutions should not converge on a diluted consensus. The above proposal could contribute to getting financial risks from global liquidity developments taken seriously without having to consider any institutional reform, just by using to their best current structures and arrangements. Of course this approach, pragmatic and adequate in the current situation, does not preclude that more structural and ambitious measures be considered as a part of a significant reform of the IMS, so many times called for but never seriously considered.

REFERENCES

Agénor P-R and L Pereira da Silva (2019): “Integrated inflation targeting”. BIS Basel. February

Allen, W A (2013): *International liquidity and the financial crisis*. Cambridge University Press

Avdjiev S, V Bruno, C Koch and H S Shin (2019): “The dollar exchange rate as a global risk factor: evidence from investment” *IMF Economic Review* Online 5 February

Ball, L M (2018): *The Fed and Lehman Brothers*. Cambridge University Press

Bank for International Settlements (2019): “Unconventional monetary policy: a cross-country analysis.” A report by a central bank group chaired by Simon Potter and Frank Smets. CGFS Papers no 63. October

----- **(2018):** “Financial stability implications of a prolonged period of low interest rates.” A report by a central bank group chaired by Ulrich Bindseil and Steven Kamin. CGFS Papers no 61. July.

----- **(2017):** “Designing frameworks for central bank liquidity assistance: addressing new challenges.” A report of a central bank group chaired by H Nakaso. CGFS Papers no 58. April

----- **(2011):** “Global liquidity: concept, measurement and policy implications” . A report of an central bank group chaired by J-P Landau. CGFS Papers no 45. November

----- **(2009):** “Capital flows and the emerging economies.” A report by a central bank group chaired by Rakesh Mohan. CGFS Papers no 33. January

Bean, C (2018): “Central banking after the great recession” 2017 Harold Wincott Memorial Lecture

Boorman, J T and A Icard, editors (2011): Reform of the international monetary system: the Palais Royal Initiative. New Delhi, Sage Publications

Camdessus, M and Singh, A (2016) “Reforming the International Monetary System- A sequenced agenda, Emerging Markets Forum Global Report

Carstens, A (2018): “Central bankers’ Swiss temple gets a shakeup in Carstens’ regime” 28 October, Bloomberg report by A Speciale and C Bosley

Carstens, A and H S Shin (2019): “Emerging markets aren’t out of the woods yet” *Foreign Affairs*

Cecchetti, S G and K L Schoenholtz (2014): “The dollar is now everyone’s problem” Money, Banking and Financial Markets blog, 29 September

Chen, S, P Liu, A Maechler, C Marsh, S Saksonovs and H S Shin (2012): “Exploring the dynamics of global liquidity” IMF Working Paper WP/12/246. October

Chui M, E Kuruc and P Turner (2018): *The World Economy* Vol 41, no 12, Special Issue on Global Trade, February

Clark J, N Converse, B Coulibaly and S Kamin (2019): “Emerging market capital flows and US monetary policy” *International Finance* Wiley

Domanski, D and P Turner (2011): “The Great Liquidity Freeze: what does it mean for international banking?” ADBI Working Paper no 291 June

Dong, H and R McCauley (2012): “Eurodollar banking and currency internationalisation” *BIS Quarterly Review* June

European Central Bank (2019): “The international use of the euro” June

----- **(2018):** “A quantitative analysis of the size of IMF resources” IRC Task force on IMF issues

G20 (2018): “Making the global financial system work for all” A report of the Eminent Persons Group on global financial governance. October

Gagnon, J (2019) “SDR bonds and SDR payment system would make the IMS more symmetric” in *The International Economy* “What to make of the dollar shortage” Washington DC Summer 2019

Geithner, T (2016): “Are we safer? The case for strengthening the Bagehot arsenal” Per Jacobsson Lecture, 8 October, Washington DC

Ghymers, C (2019): “Some general remarks on global liquidity” Mimeo

----- **(2017):** “The persistence of the Triffin dilemma today” in *Reform of the international monetary system and new global governance: how the EU may contribute*. Triffin Annual Lecture, June. RTI. International monetary issues no 3

Guzman, J G (2019): “The global financial safety net and international policy cooperation” Mimeo

Hannoun, H and P Dittus (2017): *Revolution required: the ticking time bombs of the G7 model*. ebook, available on Amazon

Hinge, D (2019): “The great wave: global liquidity in a turbulent world” *Central Banking* 7 August

Hördahl, P, J Sobrun and P Turner (2016): “Low long-term interest rates as a global phenomenon”, *BIS Working Papers*, no 574, August.

Howell, M (2018): “Global liquidity indicators” Cross Border Capital, London

Icard, A (2019): “Managing global liquidity” Mimeo

Independent Evaluation Office (2019a): *IMF financial surveillance*

----- **(2019b):** *IMF advice on unconventional monetary policies* June

-----**(2019c):** *IMF advice on capital flows*. Draft issues paper, June

International Monetary Fund (2014): “Advancing the work on foreign currency exposures” Mimeo, September

Iwata, K (2018): “Currency swap lines, bilateral loans and domestic resilience”. Japan Center for Economic Research

Jeanne, O (2018): “Analytical frameworks and toolkits in IMF surveillance” in Independent Evaluation Office *IMF Financial Surveillance. The risks and side-effects of unconventional monetary policies: an assessment of IMF views and analysis*. IEO Background Paper no BP/18-02/06

Kim, K and J Y Lee (2017): “Estimating the effects of FX-related macroprudential policies in Korea” *International Review of Economics and Finance* 50 pp 23-48

Landau, J-P (2017): “Debt as money: implications for financial stability” Keynote speech

----- **(2018):** “A liquidity-based approach to macroprudential policy”, in Mizen et al (2018)

Lombardi, M and F Zhu (2014): “A shadow policy rate to calibrate US monetary policy at the zero lower bound”, *BIS Working Papers*, no 452, June.

Lowe, P (2019): “Beware of distortions caused by monetary policy innovation” *Financial Times* 9 October

Mehotra, A, R Moessner and C Shu (2019): “Interest rate spillovers from the United States” *BIS Working Paper* no 814, September

Mizen, P, M Rubio and P Turner, Editors, (2018): *Macroprudential policy and practice* Cambridge University Press

Moessner, R and W A Allen (2015): “International liquidity management since the financial crisis” *World Economy* Vol 16, no 4, December

Nakaso, H (2018): “Reinforcing the last lines of defense” Speech at GARP Risk Forum, November

----- (2019): “A tale of two crises: are we safer today?” July

OECD (2019): *Economic Outlook* May

Padoa-Schioppa, T (2010): “The ghost of Bancor: the economic crisis and global monetary disorder.” Triffin International Foundation and Centre for Studies on Federalism

Park, Y C and K Shin (2012): “Currency internationalisation” in *BIS Papers* no 180 January

Pozsar, Z (2019): Global money notes No 24, August. Credit Suisse.

Pringle, R (2014): *The money trap: escaping the grip of global finance.* Palgrave Macmillan

R.T.I (2015): *Using the SDR as a lever to reform the international monetary system.* International Monetary Issues no 2

Ramaswamy, S and P Turner (2018): “A dangerous unknown: interest rate risk in the financial system” *Central Banking Journal* vol XXVII, no 3

Sugeno, Y and S Sugeno (2019): “Financial institutions, pension funds: investment trends in Japan.” Mimeo

Trichet, J-C (2019): “Strengthening and deepening the International Financial Architecture” Banque de France G7 conference “75 year after Bretton Woods” July 2019-09-29

Tran, H (2019): “New risks to global financial stability” Mimeo, September. (See also “Repo turmoil shows QE can endanger stability of financial system” *Financial Times*, 27 September)

Turner, P (2019): “Unconventional monetary policies and risks to financial stability.” in *The risks and side-effects of unconventional monetary policies: an assessment of IMF views and analysis.* IEO Background Paper no BP/19-01/06

----- **(2017):** “Did central banks cause the last financial crisis? Will they cause the next?” NIESR Discussion Paper no 484 December

-----**(2015):** “Bras de fer avec la volatilité: quelles options de politique pour les marchés émergents?” *Revue d'économie financière* no 119, Monnaies et globalisation financière. September

-----**(2014):** “The global long-term interest rate, financial risks and policy choices” *BIS Working Paper* no 441, February

-----**(2013):** “Caveat creditor” *BIS Working Paper*, no 419.

Villeroy de Galhau, F (2019): “75 years later – thinking about the next 75” Address by the Governor of the Banque de France at a G7 conference, July

White, W (2016): “World faces wave of epic debt defaults” Interview in *The Daily Telegraph* 19 January

Williamson, J (2016): *international monetary reform: a specific set of proposals*
Routledge

Wolf, M (2019): “Reversing the rules of good behaviour” *Financial Times* 11
July.

COMPOSITION OF THE WORKING PARTY

on «Managing Global Liquidity as a Global Public Good»

William De Vijlder, Director of Economic Research, BNP Paribas Group

Elena Flor, Director, Corporate Social Responsibility, Intesa San Paolo Group, Secretary General of RTI

Michael Gavin, Head of Global Emerging Markets, Barclays Capital, New York

Christian Ghymers, Vice-Chairman of RTI, former Adviser, European Commission

Javier Eduardo Guzmán Calafell, Deputy Governor, Banco de Mexico

André Icard, former Deputy General Manager of the BIS

Alfonso Iozzo, Vice-Chairman of RTI, former Director General of San Paolo IMI

Etienne de Lhoneux, former Secretary General of Central Bank of Luxembourg, Legal expert

Hiroshi Nakaso, President of Daiwa Research Institute (represented by two staff members of Daiwa Research Institute based in London)

Erik F. Nielsen, Group Chief Economist, Global Head of CIB Research, UniCredit

Luiz Awazu Pereira da Silva, Deputy General Manager of the BIS, former Deputy Governor of the Central Bank of Brazil

Fabrizio Saccomanni (†), Chairman of Unicredit, former Minister of Finance of Italy, former Director General of the Bank of Italy

Anoop Singh, former Director, IMF, Member of Fifteenth Finance Commission, Government of India

Bernard Snoy, Chairman of RTI, former Executive Director of the World Bank and of the EBRD (*Chair of the Working Party*)

Hung Tran, Senior Fellow, Atlantic Council - Former Executive Managing Director, Institute of International Finance

Philip Turner, former Deputy Head of the Monetary and Economic Department, BIS, Lecturer at Basel University

Jose Maria Vinals Iniguez, Group Chairman of Standard Chartered, former Financial Counsellor and Director of the Monetary and Capital Markets Department of the IMF.

Experts having accepted to be consulted

Michel Aglietta, Professor at Paris Universities, Adviser CEPII Research Center on the Global Economy

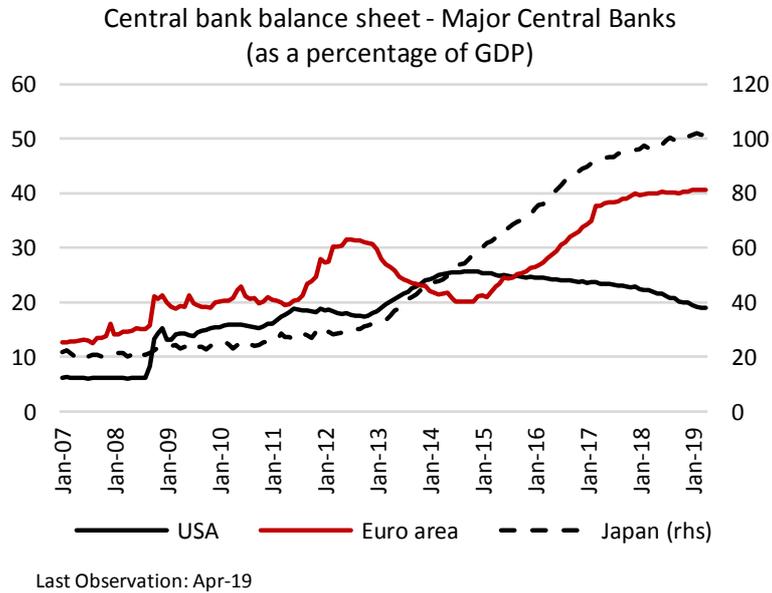
Jean-Pierre Landau, former Deputy Governor of Banque de France, Chair of Ad-hoc Group established in 2011 by the Committee on the Global Financial System (CGFS) on « Global Liquidity – concept, measurement and policy implications », BIS.

GRAPHS

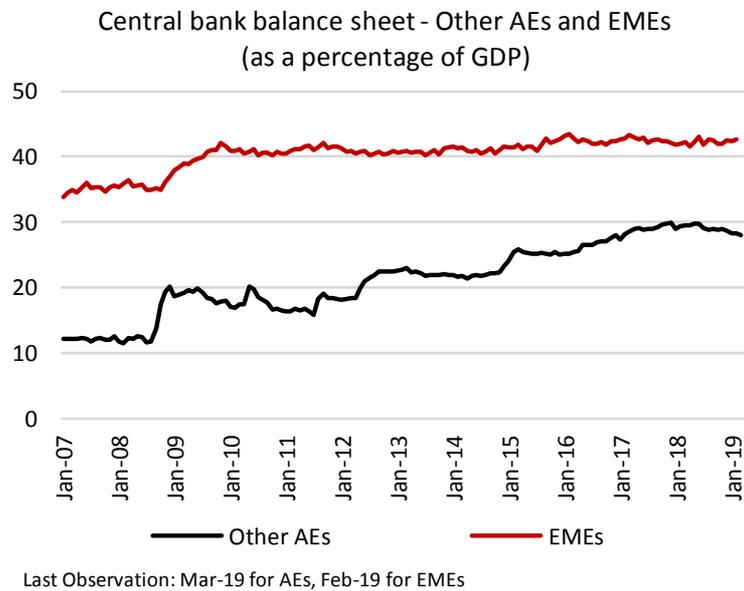
With the contribution of Prometeia Associazione



Graph 1 - Central bank balance sheets

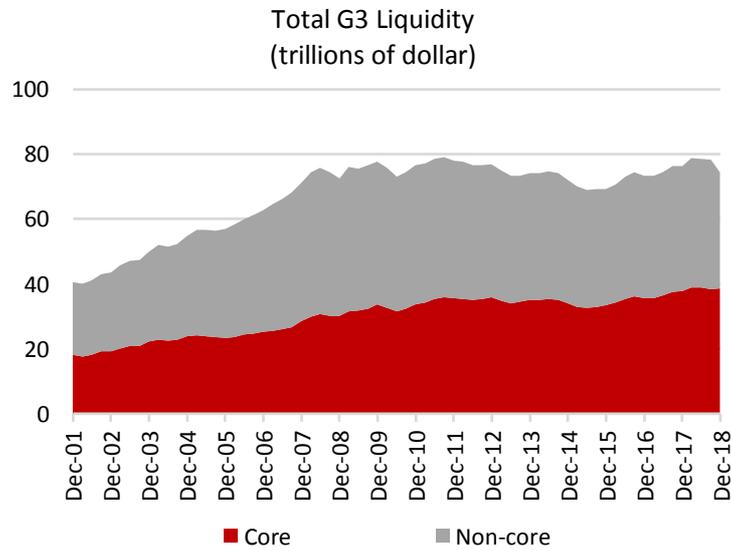


Source: BIS Annual Report, June 2018 (updated)



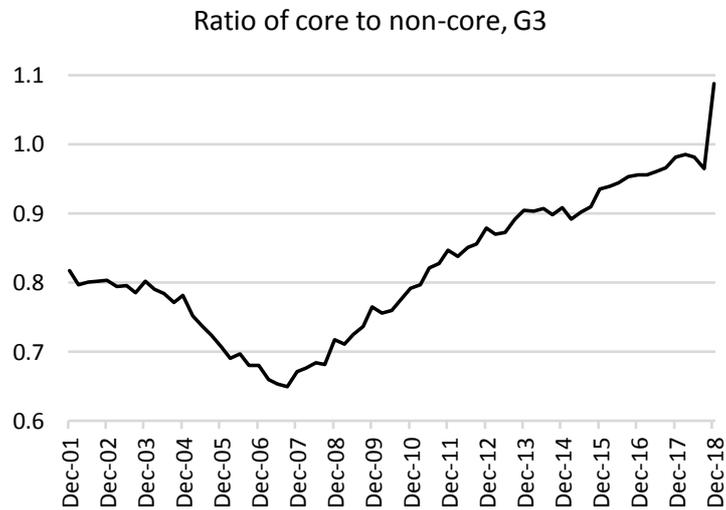
Source: BIS Annual Report, June 2018 (updated)

Graph 2 - IMF Global Liquidity Indicators



Last observation: Dec-18

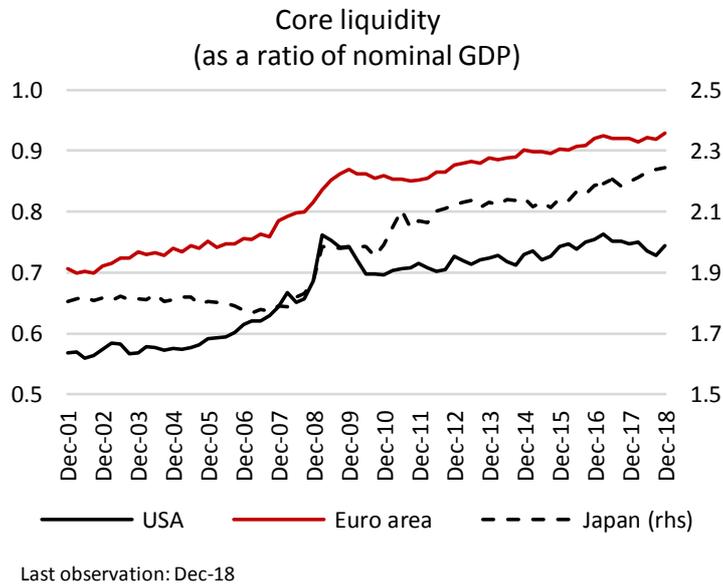
Source: Chen et al. (2012) updated by the IMF



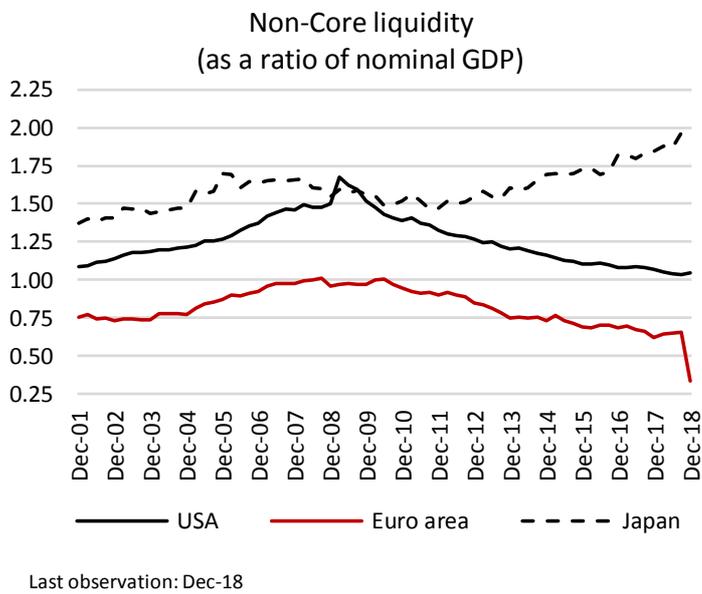
Last observation: Dec-18

Source: Chen et al. (2012) updated by the IMF

Graph 3 - IMF Global Liquidity Indicators by area

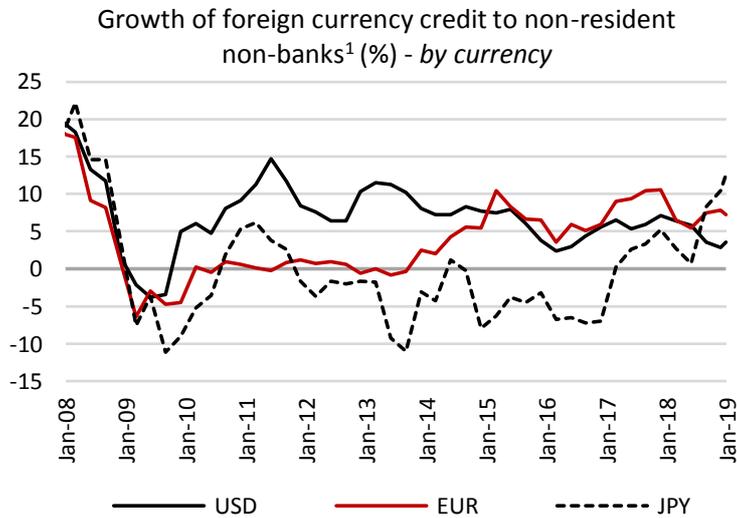


Source: Chen et al. (2012) updated by the IMF



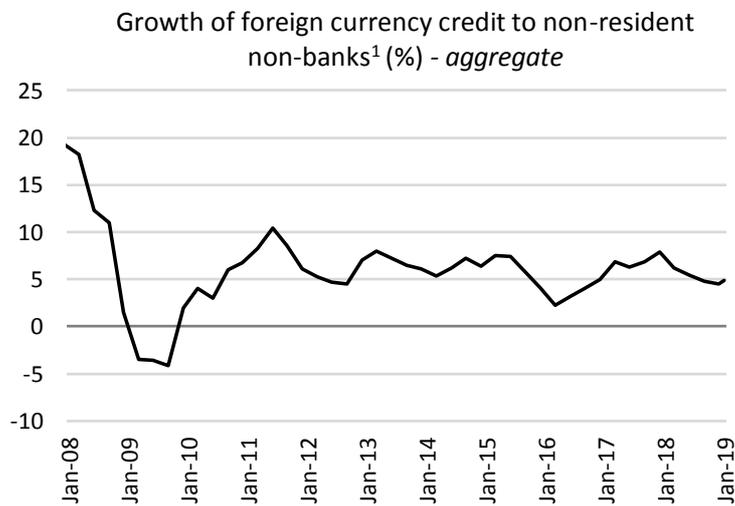
Source: Chen et al. (2012) updated by the IMF

Graph 4 – BIS: growth rates of Global Liquidity



¹ Percentage change from year-earlier quarter adjusted for series breaks.
Last observation: Jan-19

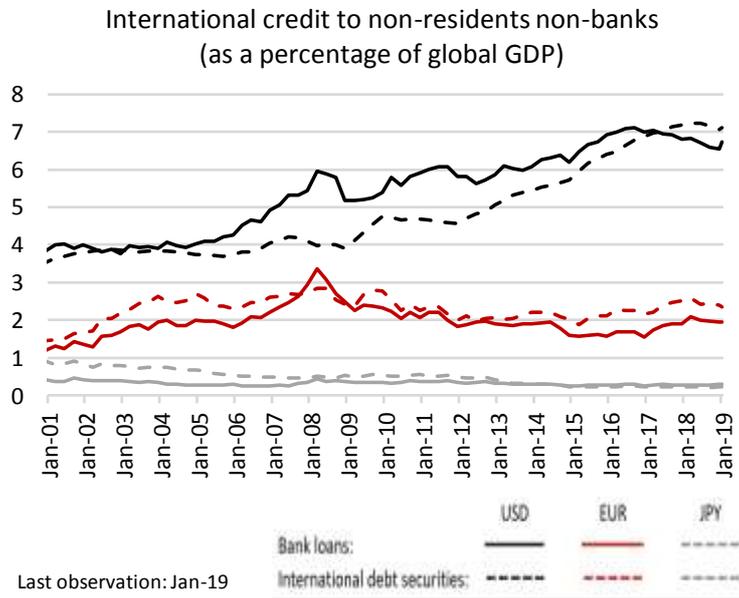
Source: BIS, Global Liquidity Indicators



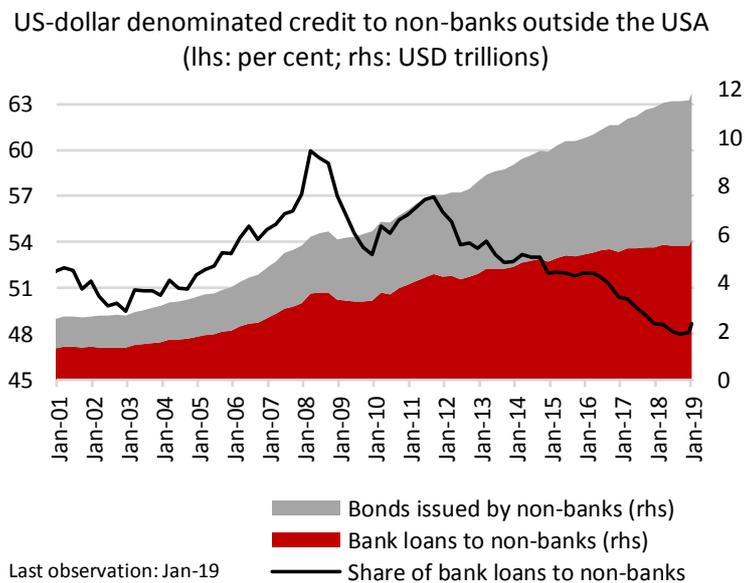
¹ Percentage change weighted by shares of dollar, euro and yen credit at end-2013. Last observation: Jan-19

Source: BIS, Global Liquidity Indicators

Graph 5 – BIS: outstandings of Global Liquidity

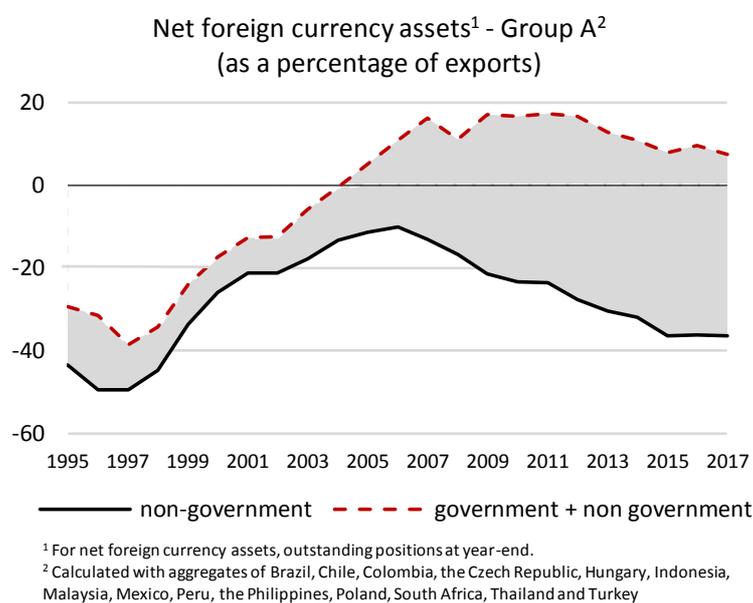


Source: BIS, Global Liquidity Indicators

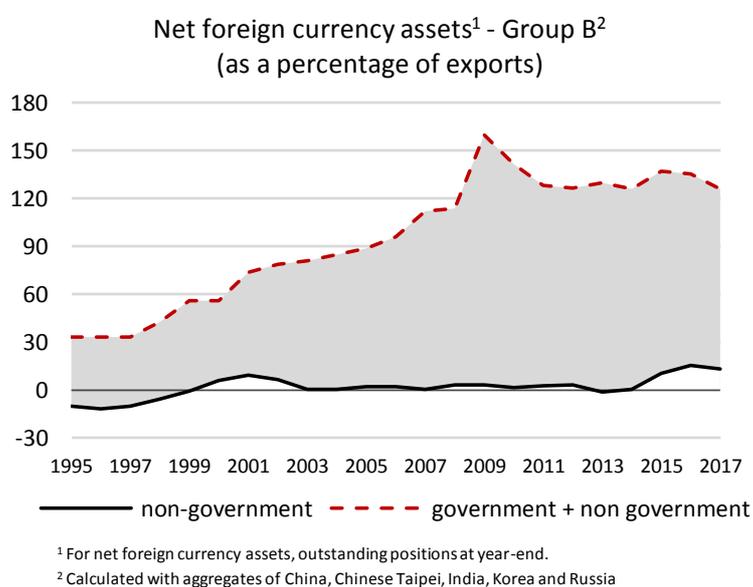


Source: BIS, Global Liquidity Indicators

Graph 6 – Currency mismatches in EMEs

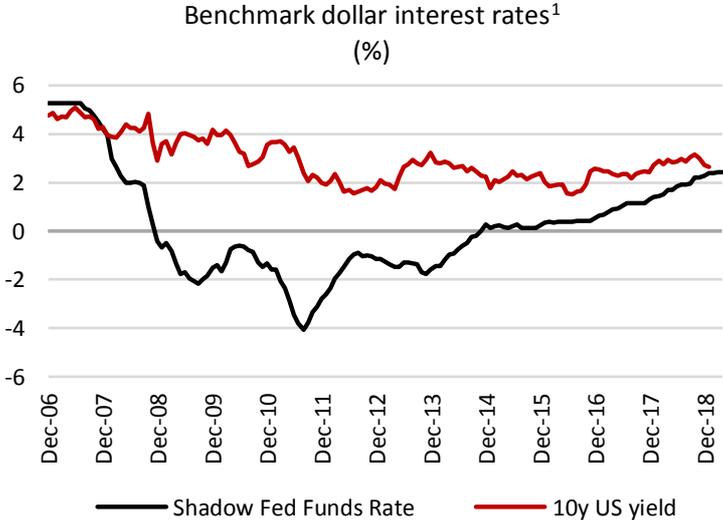


Source: M Chui, E Kuruc, and P Turner (2016)



Source: M Chui, E Kuruc, and P Turner (2016)

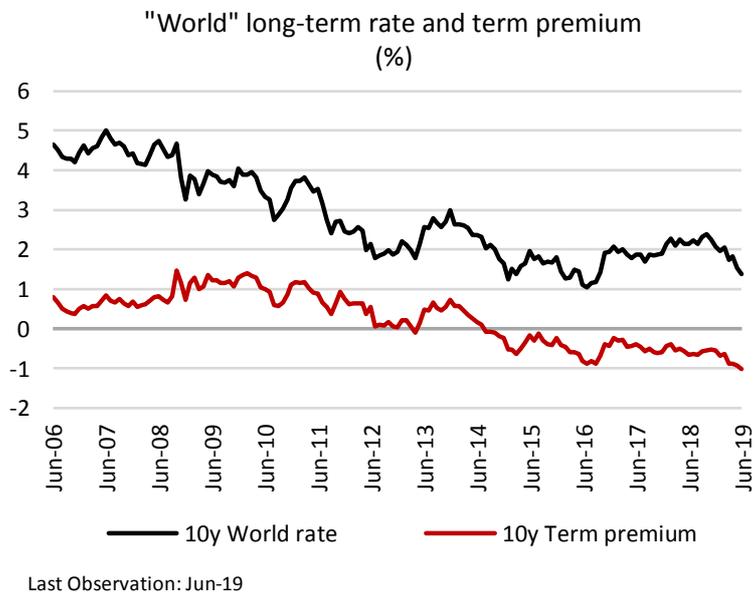
Graph 7 - Benchmark dollar interest rates



¹ Between Nov-2008 and Jul-2015, the "shadow" FFR of Lombardi and Zhu (2014) is shown. Last observation: Apr-19 for Shadow FFR, Jan-19 for 10y US yield

Source: Lombardi and Zhu (2014) updated

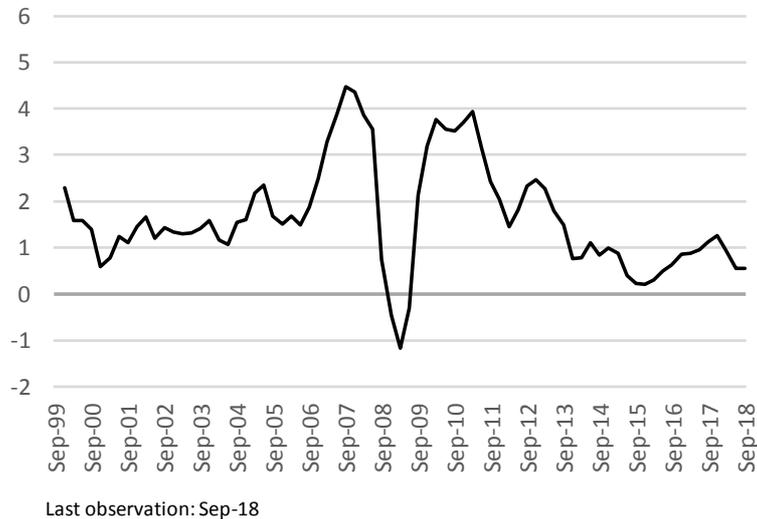
Graph 8 - "World" long-term rate and term premium



Source: Hördahl et al. (2016) updated

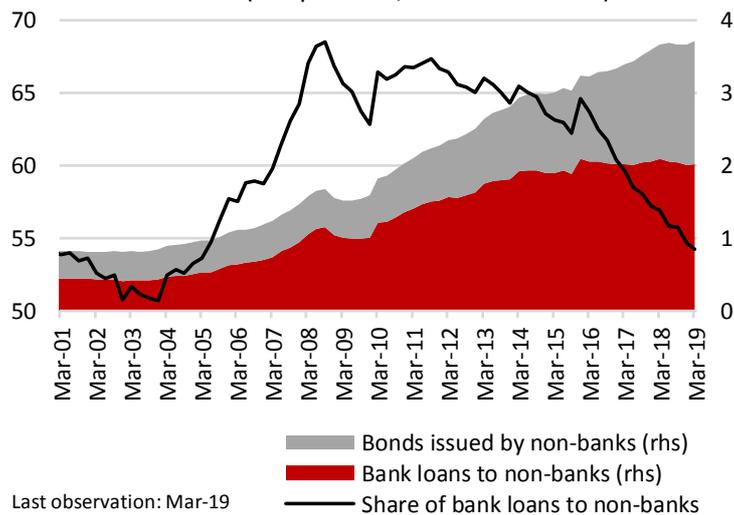
Graph 9 - Spillovers to EMEs

Panel A. Net private capital flows to EMEs (excluding China)
(as percentage of GDP, 4 quarter moving-average)



Source: Clark et al. (2019) on IMF-BoPS data

Panel B. US-dollar denominated credit to non-banks in
the EMEs (lhs: per cent; rhs: USD trillions)



Source: BIS, Global Liquidity Indicators

