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Assessing global liquidity[1]

Global liquidity has become a key focus of international policy debates, yet the term continues to be used in a variety of ways. This lack of precision can lead to potentially undesirable policy responses. In this feature, we attempt to clarify the concept of global liquidity, its measurement and policy implications. We argue that policy responses to global liquidity call for a consistent framework that takes into account all phases of global liquidity cycles, countering both surges and shortages.

JEL classification: E 50, F30, G15.

Introduction

Global liquidity has become a buzzword in discussions about the international monetary system. This reflects a broad, though often vague, perception that it is an important driver of capital flows, global asset price dynamics and inflation, and that international monetary arrangements – including exchange rate regimes, capital account policies and financial safety nets – have a major bearing on global liquidity.

The term "global liquidity" is used in a variety of ways.[2] Sometimes it has been used to refer to the stance of monetary policy in major currency areas. In this view, global liquidity is a major determinant of goods price inflation. More recently, policymakers and academics alike have put greater emphasis on the financial stability implications of global liquidity.[3] This view of global liquidity typically reflects the recognition that the availability of ample and low-cost funding in global financial markets can contribute to the build-up of financial system vulnerabilities in the form of leverage and large mismatches across currencies, maturities and countries.

The lack of a coherent conceptual framework hinders diagnosis of global liquidity conditions and the development and implementation of effective policy

[1] The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS. We are grateful to Claudio Borio, Stephen G Cecchetti and Christian Upper for useful comments on earlier drafts of this article, and to Jhuvesh Sobrun for research assistance.

[2] See Williamson (1973) for an early example.

[3] See, for example, Caruana (2011) and Shin (2011).

responses. For instance, a focus on the collapse of interbank markets during the recent crisis may lead to calls for an expansion of safety nets, but may miss the importance of appropriate measures to prevent the build-up of vulnerabilities because of ample liquidity. Similarly, an exclusive focus on monetary policy as a driver of global liquidity may miss the role of risk-taking incentives in the private sector and how these relate to economic policies.

This special feature, drawing on recent work by the Committee on the Global Financial System (CGFS),[4] discusses elements of a conceptual framework for global liquidity, and highlights the analytical challenges involved in assessing the implications for financial stability.[5] The first section of this article discusses terms and concepts, and illustrates the elusive nature of global liquidity. The second section investigates what the available data have to say about aspects of global liquidity, focusing on current conditions. The final section discusses policy implications for central banks.

Terms and concepts

In general terms, liquidity is the ease with which an asset can be converted into a means of payment. One way in which conversion may occur is through the selling of the asset. The less such a sale moves the price of the asset, the greater is market liquidity. Borrowing, in turn, can be seen as an alternative way of converting assets into cash, either by pledging assets as collateral or by issuing unsecured claims against those assets. The less borrowing moves the price of funding, the greater is funding liquidity.

These basic considerations have two important implications for the concept of global liquidity. First, at the aggregate level, liquidity depends on the interaction of funding and market liquidity. For instance, in the run-up to the financial crisis, securitisations such as mortgage-backed securities were perceived as highly liquid. This, in turn, allowed banks and other financial instutions to use these securities as collateral in repo transactions or similar activities, which increased funding liquidity. Hence, global liquidity should be understood as the overall "ease of financing" in the international financial system.

Second, this overall "ease of financing" (or perceptions thereof) depends on the actions of both private investors and financial institutions as well as the public sector. The securitisation example illustrates how liquidity is being created through interactions among private market participants. In addition, central banks supply the means of payment in the form of base money. The terms and conditions on which they do so, in turn, affect funding and market liquidity in private markets. The distinction between liquidity created by private

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[4] The CGFS is a central bank forum that monitors broad issues relating to financial markets and systems and develops appropriate policy recommendations. The CGFS places particular emphasis on assisting central bank Governors in recognising, analysing and responding to threats to the stability of financial markets and the global financial system.

[5] For reference, see the recent CGFS (2011) report on *Global liquidity – concept, measurement and policy implications*, which was prepared by a group chaired by Jean-Pierre Landau (Bank of France).

and public sector market participants, for its part, is key to understanding the sources of global liquidity and its dynamics.[6]

Private liquidity

Private liquidity is created by market participants …

Private liquidity is created by private sector market participants, including international banks, institutional investors, non-bank financial institutions (including shadow banks) and so on. For instance, financial institutions provide funding liquidity by lending in the interbank market. Or money market mutual funds provide liquidity to corporations by buying commercial paper.

… is transmitted through cross-border operations …

The availability of private liquidity is a key factor behind the build-up of exposures in the global financial system. Movements in private liquidity are transmitted internationally through the cross-border and/or cross-currency operations of bank and non-bank financial institutions. These effects can go both ways: domestic liquidity conditions can spill over to global markets and, conversely, global developments can amplify movements in domestic financial conditions and intensify domestic imbalances.

… and is endogenous

Private liquidity is *endogenous* to the conditions in the global financial system. It depends on the willingness of market participants to supply funding or trade in securities markets. For instance, the conditions under which banks can fund their own balance sheets depend, in turn, on the willingness of other private sector participants – such as money market funds or institutional investors – to provide funding or market liquidity. These funding conditions, in turn, determine the ability of banks to provide liquidity. This example illustrates that perceptions of counterparty risk or, more generally, the degree of confidence in the financial system are an important determinant of global private liquidity.

Official liquidity

Official liquidity is exogenous …

Official liquidity is funding provided by the public sector. The central bank supplies official liquidity in domestic currency in the form of reserve balances or central bank money, on terms and conditions that do not depend on the availability of funding in financial markets. Official liquidity is therefore *exogenous*.[7]

… and ultimately created by central banks

Central banks create official liquidity in their domestic currency through regular monetary operations and, in periods of stress, through emergency liquidity assistance (ELA). Other public entities, including treasuries or state-owned commercial banks, can also provide liquidity. But their ability to do so depends in principle on the conditions under which they can fund themselves in private markets – unless they have access to central bank liquidity. Ultimately, official liquidity is therefore the funding that central banks provide.

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[6] Conceptually, private and public liquidity are closely related to inside and outside money.

[7] In addition, central banks can support market liquidity by swapping liquid assets against illiquid ones, as the Federal Reserve and the Bank of England did during the financial crisis with their securities lending programmes.

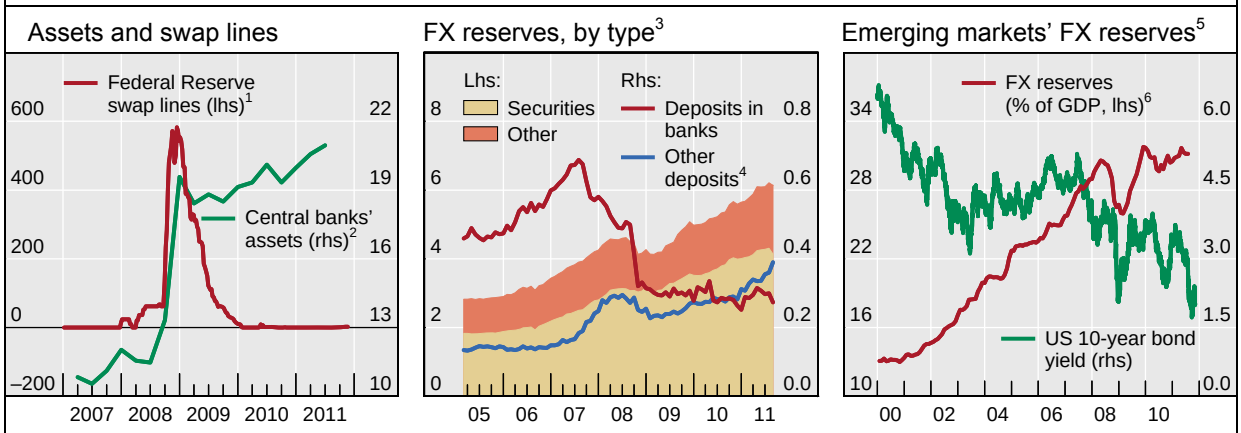
The capacity of monetary authorities to supply official liquidity depends on domestic monetary policy frameworks and the international monetary system. The exchange rate regime or currency backing requirements may constrain the ability of national authorities to issue their domestic currency. At the international level, an external anchor – such as the quantity of official gold holdings under the gold standard – could impose an absolute limit on official liquidity supply. In a pure fiat money system, by contrast, central banks can technically create any amount of official liquidity.[8]

Various mechanisms can provide access to global liquidity …

Various instruments and mechanisms can provide domestic authorities and financial institutions with access to official liquidity in foreign currency. The first is by selling foreign exchange reserves. Second, swap lines between central banks and similar facilities provide direct access to central bank money. Such swap lines between the US and European monetary authorities were critically important during the recent financial crisis, particularly in the months following the collapse of Lehman Brothers (Graph 1, left-hand panel). A third possibility are facilities offered by international financial institutions or regional financing arrangements, including IMF programmes or Special Drawing Rights (SDR). Ultimately, all these instruments give the domestic financial system access to official liquidity created by a foreign central bank, though subject to different costs and conditions ("conversion costs").[9]

Since 2008, central banks in major advanced economies have massively expanded the provision of official liquidity. Their balance sheets have swollen

Central banks' balance sheet items



[1] Outstanding amounts, in billions of US dollars. [2] 2005 GDP-PPP weighted average of the total assets of the Bank of England, the Bank of Japan, the ECB, the Federal Reserve and the Swiss National Bank as a percentage of the respective country's/area's GDP. [3] Holdings of foreign exchange reserves by 62 monetary authorities which report SDDS data to the IMF, in trillions of US dollars. [4] Currency and deposits with other national central banks, the BIS and the IMF. [5] In per cent. [6] 2005 GDP-PPP weighted average of the ratio of reserves to GDP for Argentina, Brazil, Chile, China, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Poland, Russia, Singapore, South Africa, Thailand and Turkey.

Sources: IMF; Bloomberg; Datastream; national data. Graph 1

[8] Ultimately, however, their ability to do so will depend on the level of confidence in the value of their currencies.

[9] This suggests that any measure of official liquidity would have to weigh different components of the liquidity concept in ways that reflect the different degrees to which they allow access to central bank liquidity in foreign currency ("conversion costs"), similar to the so-called Divisia monetary aggregates. See Barnett (1980).

as central banks have created liquidity in domestic currency on a large scale. As the left-hand panel of Graph 1 shows, central bank balance sheets in major advanced economies as a percentage of GDP have doubled since 2007. At the same time, nominal policy rates have fallen to near-zero levels.

Conversion costs: the case of foreign exchange reserves

... being subject to different forms of conversion cost

Foreign exchange reserves are the traditional means for accessing official liquidity in foreign currency and are typically viewed as a core component of official liquidity. Indeed, foreign exchange reserves have been used to alleviate foreign currency funding pressures in domestic financial systems, for example in Korea and Brazil during the recent financial crisis. However, the degree of self-insurance afforded by such stocks of reserves depends on the size and source of the shock hitting the domestic financial system as well as the instruments and currencies the reserves are invested in. Hence, the use of foreign exchange reserves is subject to various forms of conversion cost.

First, there are costs at the level of the individual reserve holder. Only a small fraction of foreign exchange reserves is held in the form of deposits with central banks or as (term) deposits with private banks (about 5% in each case), whereas the bulk is invested in securities, mostly US Treasuries and government bonds of euro area sovereigns (Graph 1, centre panel). Converting these foreign assets into funds that can be used to settle foreign currency claims involves costs that depend on market conditions. Such costs may be low in the case of a country-specific shock, when global interbank and securities markets remain liquid. But it may not be so easy to deploy reserves quickly in the event of a global liquidity shock, as drawdowns of such reserves by multiple countries at the same time could depress the prices of foreign reserve assets.

Second, deploying foreign exchange reserves may also involve more indirect costs in the form of higher country risk premia in financial markets and depreciation pressure on the domestic currency (which could result from lower reserve levels). This can aggravate the very foreign currency funding pressures that the use of foreign exchange reserves is supposed to alleviate. Indeed, concerns that only a fraction of the stock of foreign exchange reserves can be used without triggering adverse confidence effects have reinforced calls for alternative mechanisms for insuring against liquidity shortages.[10]

Third, mobilising foreign exchange reserves may also impose costs on international financial markets and institutions by adversely affecting liquidity conditions at the global level. For instance, drawing down reserves that are deposited with commercial banks would reduce funding liquidity. This can have knock-on effects on the financial system more broadly – for instance, if the affected banks struggle to replace their corresponding foreign currency funding, as experienced during the Lehman crisis (Graph 1, left-hand panel). Only foreign reserves held in the form of central bank money will tend to avoid such effects.

[10] See Baba and Shin (2010).

The interaction between private and official liquidity

In a world with high international capital mobility and a well developed financial system, private sources of liquidity quantitatively dominate public ones. But the two can, and do, behave quite differently over time. Private liquidity is procyclical, driven by changes in a variety of factors, including growth rates, growth differentials, monetary policies, regulatory frameworks and, above all, investors' attitude towards risk. Furthermore, structural developments that help shape the way international banks operate, such as financial innovation and integration, also play a role. This multitude of factors and their interdependence underline the endogenous character of private liquidity.[11]

Official and private liquidity interact in various ways …

Official and private liquidity interact in various ways. One way to think about this interaction is the traditional money multiplier concept: by determining the risk-free short-term interest rate and the amount of funds available to settle payments through the central bank, official liquidity is the basis for private liquidity creation. In times of crisis, however, private liquidity tends to evaporate and global liquidity collapses into its official component – or, to use the money multiplier analogy, the multiplier falls to zero. In those circumstances, global liquidity will crucially depend on individual banks' access to official sector funding. This is particularly relevant when banks' funding needs are in a foreign currency, constraining the ability of the domestic central bank to address liquidity shortages, as observed in late 2008.

… including through the reinvestment of foreign exchange reserves

But the interactions between private and public liquidity are arguably more complex than this conventional view suggests. For instance, private capital flows may lead to foreign exchange reserve accumulation (increasing official liquidity), and the reinvestment of these reserves in the liquid assets of other countries may help to further ease financial conditions (increasing private liquidity). There are signs, for example, that the channelling of large reserve holdings into government securities can contribute to global liquidity conditions through its effect on yield levels (Graph 1, right-hand panel).[12]

Indicators and measures

The conceptual considerations above suggest that measures of global liquidity should capture the evolution of both private and official liquidity as well as the ease of financing in the global financial system. The former would call for indicators that track the quantity of liquidity in the system, while the latter would tend to emphasise measures of the availability of market and funding liquidity. Ideally, such measures should also provide early indications of financial system vulnerabilities.

[11] For more details, see CGFS (2011) and Bruno and Shin (2011).

[12] Warnock and Warnock (2009) estimate that foreign purchases lowered US Treasury yields by some 90 basis points in 2005.

Credit aggregates and the evolution of global liquidity[13]

Global credit aggregates allow an analysis of global liquidity …

Several arguments speak in favour of using credit aggregates as a proxy for global liquidity.[14] First, private sector credit stands at the end of the financial intermediation chain and captures the interaction of market and funding liquidity. Credit measures also provide broad coverage of private liquidity sources, including banks and securities markets. Moreover, credit aggregates have been shown to behave as early warning indicators, especially when combined with measures such as asset prices.[15] Cross-border positions, particularly those in interbank markets, will be important when the focus is on how changes in liquidity conditions are transmitted internationally and affect domestic financial stability in the target economies.[16] This places a premium on measures that capture such interlinkages.

Second, international credit aggregates facilitate the analysis of global liquidity conditions from various vantage points. One such perspective suggests that, worldwide, bank credit continued to expand throughout the recent crisis (Graph 2). Cross-border credit and, hence, internationally intermediated lending did contract (green line), but the growth rate of total bank credit remained positive.

… from the perspective of: the recipient country …

A complementary, "*recipient economy*" perspective focuses on the evolution of borrowing by non-banks in individual economies. This perspective can, for instance, inform assessments of whether cross-border credit flows are associated with a build-up of vulnerabilities in the recipient country's financial system. Differences in credit growth across countries and regions are considerable (Graph 2). While total bank credit to non-banks in the United States and the euro area has levelled off since the start of the crisis, Asia-Pacific has seen a particularly strong rebound in cross-border credit. This is in line with the observation that cross-border and foreign currency credit tend to grow especially strongly within countries that are experiencing a domestic credit boom – such as China.[17]

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[13] The calculation of these measures relies heavily on the BIS international banking and securities statistics. These data allow the construction of consistent credit aggregates and maturity mismatch measures that include cross-border bank lending and – to some extent – securities issuance. For details, see Borio et al (2011).

[14] A potential problem in using credit aggregates as measures of global liquidity is that they do not focus on liquidity or financing conditions as such, but rather on one of the *outcomes* of these conditions. This may complicate interpretation, because credit aggregates may change irrespective of any developments in financing conditions.

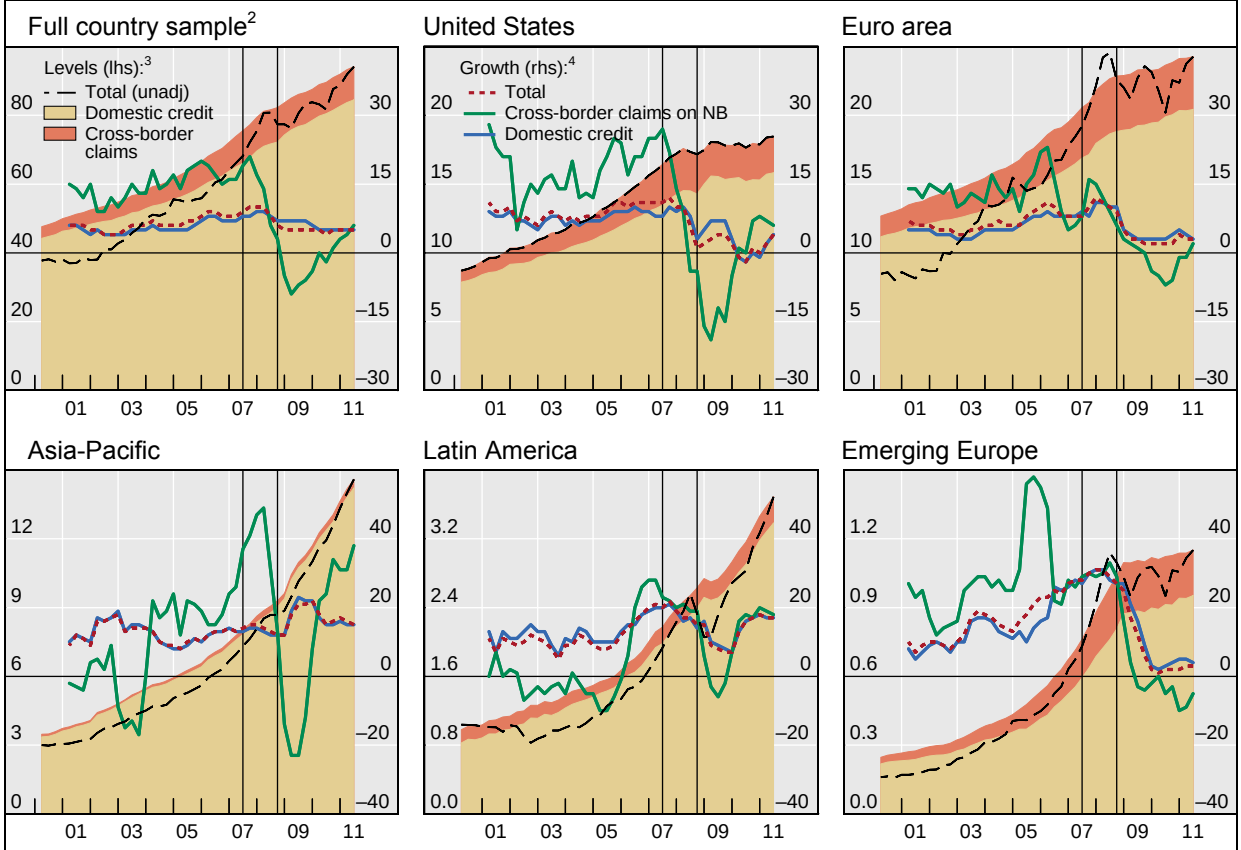
[15] In particular, there is a growing literature suggesting that joint cumulative increases in private sector credit and asset prices beyond historical norms tend to herald subsequent financial distress. See, for example, Alessi and Detken (2009) and Borio and Drehmann (2009).

[16] See Bruno and Shin (2011) for a theoretical model capturing these effects.

[17] This could be because banks that lend cross-border may have less information than local lenders on the quality of borrowers. Therefore, these banks may have been over-optimistic about the strength of borrowers in foreign markets in the upswing, to then change their assessment in the downswing. Another possibility is that internationally active banks may regard foreign markets as less important to their business than is the case for domestic banks, which might affect their willingness to expand or contract their international activities in a procyclical fashion. It is also possible that internationally active banks faced bigger negative

Global bank credit aggregates, by borrower region

At constant end-Q2 2011 exchange rates[1]



The vertical lines represent end-Q2 2007 and end-Q3 2008.

[1] The shaded areas indicate total bank credit to non-bank borrowers (including governments), expressed in US dollars at constant end-2010 exchange rates. The dashed black line shows unadjusted total credit converted into US dollars at contemporaneous exchange rates. The shaded areas are adjusted using various components of the BIS banking statistics to produce a breakdown by currency for both cross-border credit and domestic credit. [2] Aggregate for a sample of 51 countries. [3] In trillions of US dollars. [4] In per cent.

Sources: IMF, *International Financial Statistics*; BIS international banking statistics; BIS calculations. Graph 2

… credit originator and …

Yet another perspective is that of the credit originator. Here, it is important to distinguish the economy that issues the currency – the "*currency of denomination*" perspective – from the intermediaries that extend credit, possibly in foreign currency – the "*lender*" perspective.

… currency of origination

The "*currency of denomination*" perspective considers global credit provided in a particular currency, and may help to answer the question to what extent funding conditions in one particular currency contribute to global liquidity. Most international credit is denominated in US dollars, euros, yen, sterling and Swiss francs. Graph 3 (left-hand panel), illustrating the case of the US dollar, shows that the international component of global credit can be quite sizeable. In mid-2010, dollar credit to non-US residents reached 13% of dollar credit to the non-financial sector worldwide, from 10% in 2000. The right-hand panel of Graph 3 shows that, as in recent quarters, US dollar credit to the rest

shocks in their home markets and that these banks relied more on wholesale funding than domestic banks.

of the world has at times grown faster than credit to US residents. The growth of dollar credit to households and non-financial businesses outside the United States exceeded 10% at the end of 2010, while lending to US non-financial sectors stagnated.

The *lender perspective* sheds light on the evolution of the international credit and funding exposures of banks (and other intermediaries). Growth in funding exposures and the currency and/or maturity mismatches of banks are an indication of financial vulnerability and may force a contraction of global liquidity if bank balance sheets come under stress (Fender and McGuire (2010)). Current deleveraging pressures in the European banking sector should be seen in this light (Carney (2011)).

Assessing the ease of financing by combining quantity- and price-based indicators

These aggregates can also be combined with price-based measures ...

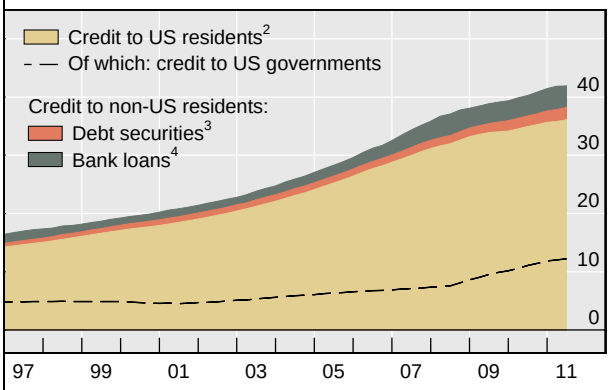
The combination of price and quantity measures supports assessments of the ease of financing. Price-based indicators provide information about liquidity supply conditions in different markets, while quantity-based indicators capture how far such conditions translate into changes in exposures and risks. Key indicators in this regard are proxies of risk appetite, which is – as discussed above – a major driver of the willingness of private investors to provide funding and, therefore, of private liquidity (Table 1).

... such as risk appetite proxies

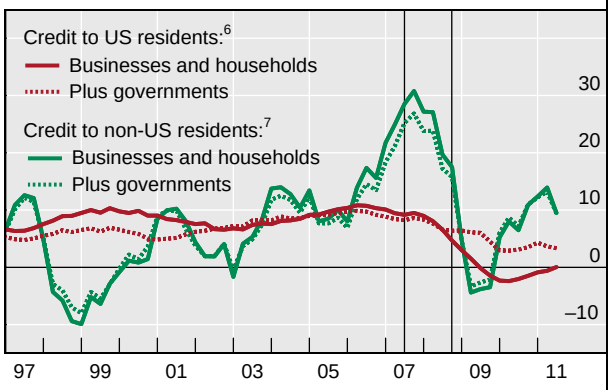
Graph 4 illustrates the combined use of price and quantity measures, showing indicators of cross-border credit extension by BIS reporting banks together with the VIX index as a simple proxy for risk appetite (which, in turn,

Domestic and international US dollar credit

Credit to the non-financial sector[1]



Growth in credit to the non-financial sector[5]



[1] In trillions of US dollars. [2] Non-financial sector debt of residents of the United States, consisting of debt securities, mortgages, bank loans, commercial paper, consumer credit, government loans, and other loans and advances; it excludes trade debt, loans for the purpose of carrying securities and funds raised from equity sources. [3] Outstanding US dollar debt securities issued by non-financial residents outside the United States. [4] Cross-border and local US dollar loans to non-banks resident outside the United States. For China, local US dollar loans to non-banks are based on national data on total local lending in foreign currency and assume 80% are denominated in US dollars. For other non-BIS reporting countries, local US dollar loans to non-banks are proxied by all BIS reporting banks' cross-border US dollar loans to banks in the country. [5] Year-on-year growth, in per cent. The vertical lines represent end-Q2 2007 and end-Q3 2008. [6] The solid red line is total credit to the non-financial *private* sector in the United States. The dotted line includes credit to the US governments. [7] The solid green line is estimated total credit to the non-financial *private* sector outside the United States. The dotted line includes US dollar international debt securities issued by the non-US public sector.

Sources: Borio et al (2011); People's Bank of China; Board of Governors of the Federal Reserve System; BIS international debt statistics and locational banking statistics by residence. Graph 3

proxies financial sector leverage).[18] Two broad patterns emerge. First, the growth in international bank credit exhibits boom-bust cycles that appear to correspond closely to episodes of financial distress, characterised by high volatility and low risk appetite, shown as spikes in the VIX. Second, the co-movement of cross-border credit and risk appetite proxies appears consistent with the notion of a global liquidity cycle. Periods of particularly strong growth in cross-border credit are often characterised by elevated risk appetite, while episodes of credit contraction are typically associated with low risk appetite.

Against this backdrop, the recent spike in the VIX may be indicative of a reduction in the supply of global liquidity in the second half of 2011. This is consistent with anecdotal evidence that market pressures for European banks have forced a retrenchment of these institutions from activities involving foreign currency funding, such as trade and commodities financing.

Open technical and analytical issues

Open issues include aggregation ...

Turning the indicators discussed above into a fully fledged framework for the assessment of global liquidity faces a number of challenges. The first is aggregation. The appropriate credit aggregate may depend on the analytical question at hand. For example, when assessing financial exposures of households and corporates, information on the currency composition of credit is of particular importance.

Selected complementary indicators

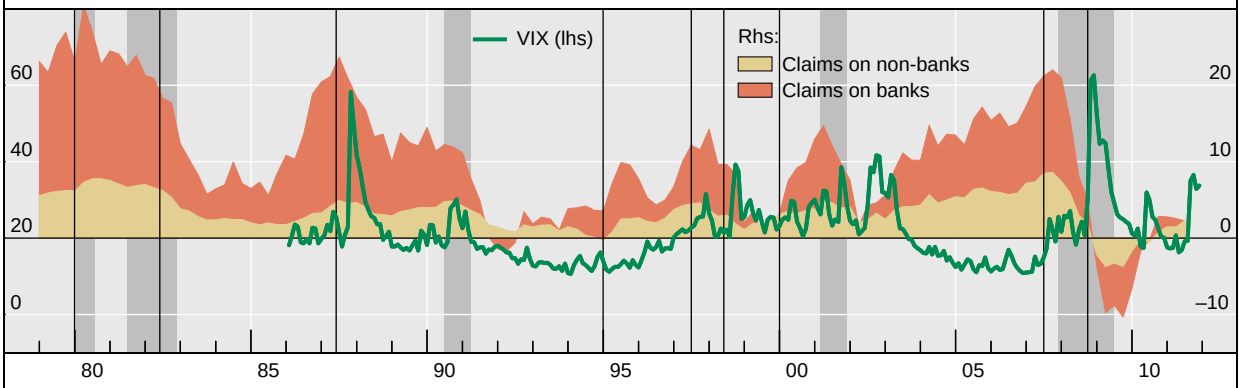
	Quantities	Prices
Monetary liquidity	Base money and broader monetary aggregates Foreign exchange reserves	Policy and money market interest rates Monetary conditions indices
Funding liquidity	Bank liquidity ratios Maturity mismatch measures CP market volumes	Libor-OIS spreads FX swap basis Bond-CDS basis Surveys of funding conditions
Market liquidity	Transaction volumes	Bid-ask spreads on selected global assets Qualitative fund manager surveys
Risk-taking and valuation	Bank leverage ratios	VIX index and other risk appetite measures Sharpe and carry-to-risk ratios Asset prices and spreads Price/earnings ratios

Table 1

[18] The patterns shown in Graph 4 apply in a similar fashion also for other risk appetite proxies and for indicators known or expected to correlate with risk-taking in the private sector. See, for example, Adrian and Shin (2008), who find that VIX index readings provide a good proxy for financial sector leverage.

Contributions to growth in total international claims[1] and VIX index readings

In per cent



The vertical lines mark: 1979 second oil shock; 1982 Mexican default; 1987 stock market correction; 1994 Mexican peso devaluation; 1997 Asian financial crisis; 1998 Russian default and LTCM; 2000 Nasdaq peak; 2007 global financial crisis; 2008 collapse of Lehman Brothers. The shaded areas mark US recessions (NBER definition).

[1] The stacked areas indicate the contributions to the total year-on-year rate of growth in international claims, which include BIS reporting banks' cross-border claims in all currencies and locally extended foreign currency claims on residents of reporting countries. "Claims on banks" include cross-border claims on own offices; year-on-year changes. Contributions to growth are calculated as the sum of the exchange rate-adjusted changes in claims on sector *i* in periods *t* to *t*–3 divided by the stock of claims on all sectors at period *t*–3.

Sources: NBER; Bloomberg; BIS locational banking statistics by residence. Graph 4

In contrast, when assessing the role of different intermediation channels in the provision of liquidity, distinguishing between bank and non-bank providers of credit is essential. Graph 5 shows total credit to the non-bank sector in different countries together with the estimated amount which is provided by banks.[19] In France, Germany, the United Kingdom and the United States, for example, non-banks supply roughly half the total. In contrast, banks are the main suppliers of funds in Japan and Spain. In most emerging market economies (not shown), banks provide the bulk of credit to non-bank borrowers, although in several (eg the Czech Republic, Hungary and Poland) the share of total credit provided by non-banks is similar to that in advanced economies.

... as well as global liquidity dynamics

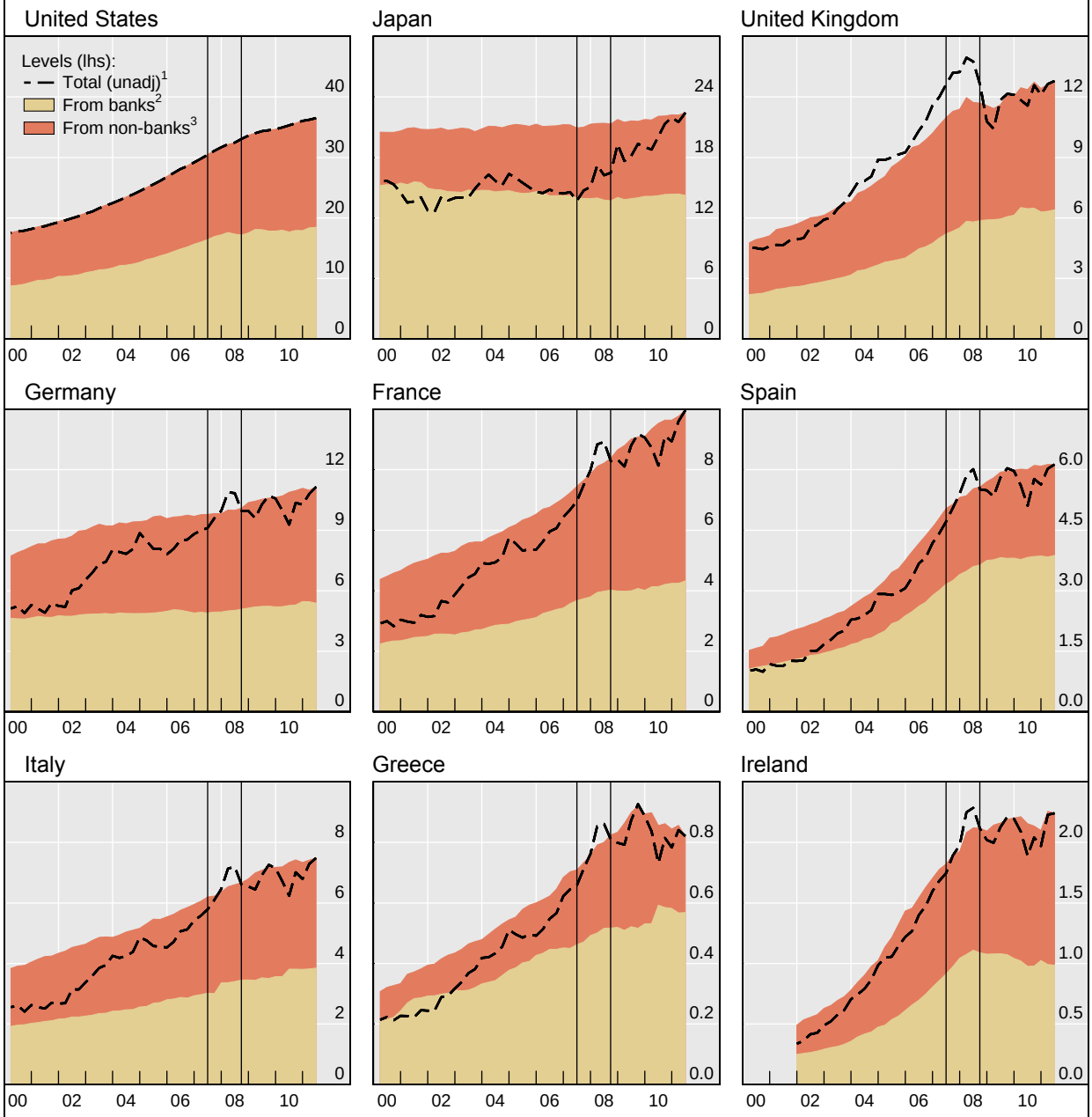
A second issue is data gaps. More granular information on creditor-side data in individual sectors would help improve the monitoring of global liquidity conditions. For instance, more comprehensive data on currency composition and maturity of international claims would enhance the diagnosis of the build-up of financial system risks associated with ample global liquidity. The same applies more generally for data on the shadow banking sector and derivatives market activities.

A third, related issue is the need for analytical work to better understand the dynamics of global liquidity and its impact on financial markets and institutions. For example, the interaction of private and public liquidity is not fully understood. Private sector perceptions that central banks will support liquidity in times of stress may affect risk-taking and the ease of financing. Other linkages between private and official liquidity may result from the use of

[19] Note that this amount provided by banks includes their loan *and* debt securities claims, and thus is not synonymous with an *instrument* breakdown of total credit (eg loans vs securities).

private financial instruments when providing or managing official liquidity. For instance, the collateral policies of central banks may influence the terms and conditions of secured funding in private markets. Another example is, as mentioned above, the impact of foreign exchange reserves on the markets of those assets where the reserves are invested.

Total liabilities of non-banks, by creditor type



[1] Total credit to non-bank borrowers (including governments), taken from national flow of funds statistics and expressed in US dollars at contemporaneous exchange rates. [2] Total credit provided by banks, which is the sum of domestic credit and BIS reporting banks' cross-border claims on non-banks in the country, expressed at *constant end-Q2 2011 exchange rates*. [3] Credit provided by non-banks, expressed at constant end-Q2 2011 exchange rates. Estimates based on first taking the difference between total credit and the unadjusted value of total bank credit, and then applying the same currency shares available for bank credit to this difference.

Sources: IMF, *International Financial Statistics*; national flow of funds statistics; BIS locational banking statistics. Graph 5

Policy issues

Policy responses need to address both surges and shortages, and include ...

The dominant role of the choices and decisions of financial institutions and other economic agents in determining global liquidity has important implications for the design of policy frameworks aimed at ensuring financial stability. First, policies need to take into account the full liquidity cycle – liquidity surges and their associated contributions to systemic risk as well as liquidity shortages or disruptions in the provision of private liquidity. Second, policy frameworks need to be sufficiently robust to uncertainty about the exact sources and impact of global liquidity surges and sufficiently flexible to address sudden shortages in liquidity conditions at the global level.

... microprudential as well as ...

Policy responses to surges in global liquidity are closely associated with the financial reform agenda. Microprudential measures that prevent excessive maturity transformation – such as the liquidity coverage ratio (LCR) under Basel III – and that enhance the resilience of financial institutions more generally – such as the new, higher capital ratios – will tend to reduce the size and frequency of abrupt changes in liquidity provision due to banking sector strains. And measures that help to counter the procyclicality of credit (such as leverage ratios and capital conservation buffers) will tend to dampen cyclical fluctuations in private liquidity.

... macroprudential measures ...

Macroprudential tools can also be used to address global liquidity surges. The new Basel III framework goes some way in this direction by providing a macroprudential overlay targeting both the cross-sectional dimension of systemic risk (eg capital surcharges for systemically important institutions) and its time dimension (eg the countercyclical capital buffer).[20]

... macroeconomic policy and ...

In addition, macroeconomic policy has an important part to play. Fiscal, monetary and exchange rate policies are ultimately and necessarily set to meet domestic policy objectives. At the same time, macroeconomic policy settings can be a key influence on global liquidity and the international transmission of liquidity cycles. Policy settings that help to avoid the build-up of domestic financial imbalances can, hence, also help to prevent unwanted surges in global liquidity. For instance, greater exchange rate flexibility may be consistent with domestic macroeconomic objectives, while helping to dampen global liquidity spillovers. In particular, such flexibility can reduce private sector incentives to establish unmatched foreign currency funding and investment positions.

The possible need to respond to liquidity shortages raises the issue of when and how the official sector should step in to fill the gap. To be sure, successful prevention of unsustainable surges in liquidity could substantially reduce the frequency and size of liquidity shortages. Even so, additional policy measures may still be needed.

... self-insurance mechanisms

Designing policies to address liquidity shortages involves questions about the effectiveness of self-insurance mechanisms, including precautionary accumulation of reserves and financial safety nets. Key considerations in this

[20] See BIS-FSB-IMF (2011).

context are the nature of the shock and the degree of pre-commitment and moral hazard risk.

The appropriate policy responses will have to be calibrated to the possible size and nature of the liquidity shock. In the case of idiosyncratic and smaller-scale regional shocks, self-insurance in the form of precautionary foreign reserves holdings and supply of liquidity through mechanisms for redistributing official liquidity, such as IMF programmes, SDR allocations and regional support arrangements, will typically be sufficient.

Only central banks can address global liquidity shocks

In the case of a global liquidity shock, however, drawing on such prearranged mechanisms may not suffice. For instance, a freezing of interbank markets in major funding currencies, as during the recent crisis, may require the ability to supply official liquidity in major currencies in an elastic manner. Only the currency-issuing central banks have this ability.

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