Deutsche Bank Research

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Is the next global liquidity glut on its way?

Some years prior to the crisis, abundant global liquidity and investors' strong risk appetite boosted asset prices to very high levels. When investors started searching for higher returns in 2003, excess liquidity began to pour into financial asset markets, driving prices up and yields down. At the time when investors were confronted with increased default risk but in turn only received low returns the credit bubble burst, starting in the US mortgage market.

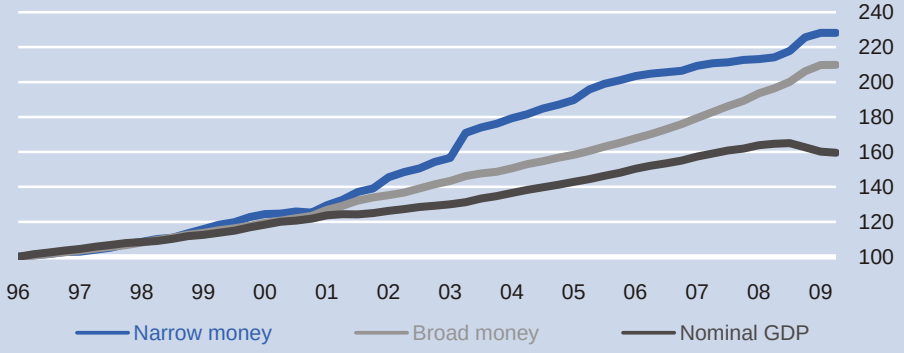
The state of the global economy and financial markets deteriorated dramatically when the subprime crisis turned into a full-blown global banking and economic crisis. Central banks around the world were forced to inject extra liquidity to support the banking sector, the credit channel and the overall economy. Owing to sharply expanding central bank balance sheets, some observers have become worried about the formation of another liquidity glut and its potential impact on CPI and asset price inflation.

Global excess monetary liquidity has never disappeared but keeps growing. Indeed, global excess liquidity (defined as a rising money-to-GDP ratio) is currently created due to shrinking nominal GDP as well as accelerating narrow money and softer, but still positive broad money supply growth, as central banks support the financial system and the economy.

Despite the presence of global excess liquidity short and medium-term risks to CPI inflation appear to be limited because of low capacity utilisation and rising unemployment. However, excess liquidity could still potentially stoke new asset price bubbles. Central banks are aware of this risk and are at the moment preparing post-crisis exit strategies from their current accommodative monetary policy stance.

Given accelerating global excess liquidity creation, it may only be a matter of time until investors become increasingly unwilling to hold liquidity at the current low level of return. Once investors try to reduce their liquidity holdings, asset prices may again receive a temporary boost from global excess liquidity.

G5: Money supply continues to outpace nominal GDP
USD GDP-weighted (2000), Index: Q1 1996 = 100



Sources: DB Research, IHS Global Insight, IMF

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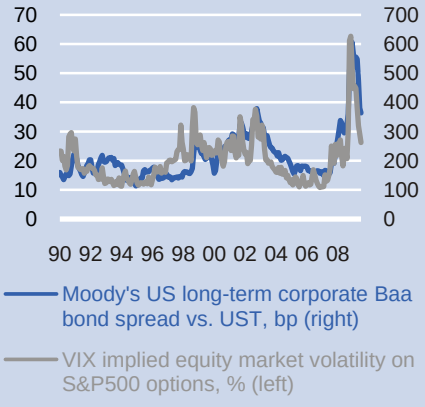
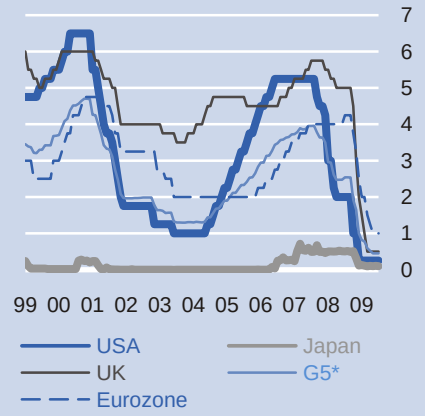
Implied equity volatility and credit spreads down but still elevated



Sources: Moody's, IHS Global Insight, Bloomberg, DB Research 1

Major central banks cut interest rates aggressively

*USD GDP-weighted (2000), %



Sources: DB Research, IHS Global Insight, IMF 2

US T-Bill yields fell to low levels thanks to Fed rate cuts and flight to quality

%

Source: IHS Global Insight 3

1. Introduction

In light of the financial crisis and surging central bank balance sheets, we think it is a good time to give an update on global monetary liquidity developments. This report is a follow-up to our Current Issues paper 'Global liquidity glut and asset price inflation: Fact or fiction?' published in May 2007. At that time abundant global liquidity, a savings glut due to rapid FX reserve accumulation as well as investors' high willingness to take risks had boosted prices of risky assets to very high levels.[1] When investors started searching for higher returns in 2003, excess liquidity began to pour into financial asset markets, driving prices up and yields down. At the time when investors were confronted with increased default risk but in turn only received low returns the credit bubble burst, starting in the US mortgage market. The US subprime crisis became a full-blown global banking and economic crisis. Stock markets sold off, implied equity market volatility rose to unprecedented levels and credit spreads surged to multi-decade highs. The global economy fell into recession. Money markets became strained and investors fled to safe, highly-liquid government securities. Central banks were forced to provide massive extra liquidity and to cut interest rates sharply to avert any further deterioration.

Given that central bank liquidity has risen significantly further for a couple of months due to the implementation of non-standard monetary policy measures[2], some market participants have become worried about the potential formation of another global liquidity glut and its future impact on CPI and asset price inflation. Medium-term risks to global CPI inflation appear to be rather limited because of the currently very low levels of capacity utilisation, rising unemployment and hence low wage pressures.[3] Indeed, CPI inflation has continued to decline dramatically as oil prices have plunged from their summer 2008 record highs. As regards asset prices, there have been tentative signs that risk appetite has partly returned. For instance world equity indices have strongly recovered from their early 2009 lows and credit spreads narrowed. Is the stock market rebound already a forerunner of the next economic recovery? Or is it simply the start of the next asset price bubble?

In the following we want to review the interplay between global liquidity and asset prices. We are interested in whether the current aggressive monetary policy easing could again lay the ground for the next asset price bubble. Firstly, we describe what liquidity exactly is, how it is created and how it can be measured on a global level. Secondly, we focus on the sources of excess liquidity. Thirdly, we analyse the role of abundant liquidity during the previous asset price boom. Finally, we want to draw conclusions about the medium-term outlook for global excess liquidity and analyse what this could potentially mean for future CPI and asset price inflation.

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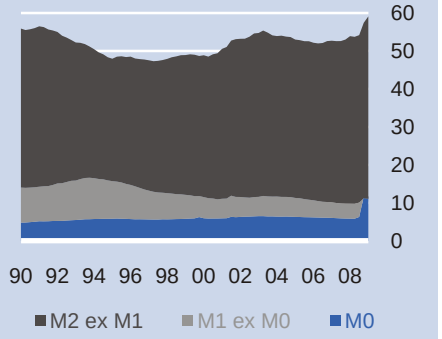
1 We want to stress that the presented global liquidity aggregates in this research note may partly differ from the ones used in Becker, Sebastian (2007) owing to methodological changes (concerning national money supply, basis years).

2 While the BoJ has become known for 'quantitative easing' by mainly conducting outright purchases of government bonds, the Federal Reserve is currently engaging in 'credit easing' by making use of direct lending facilities versus market participants. The ECB's 'enhanced credit support' consists of liquidity management measures (e.g. the enlargement of the list of eligible assets as collateral and the maturity lengthening of its re-financing operations) and outright covered bond purchases. See Trichet, Jean-Claude (2009).

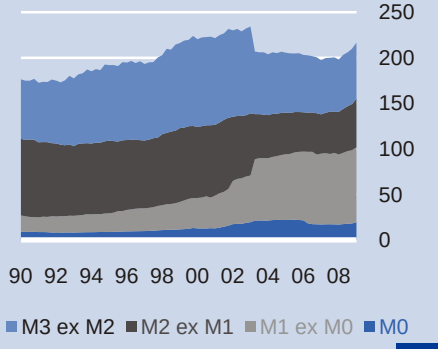
3 See Gräf, Bernhard and Stefan Schneider (2009).

US money supply
% of GDP



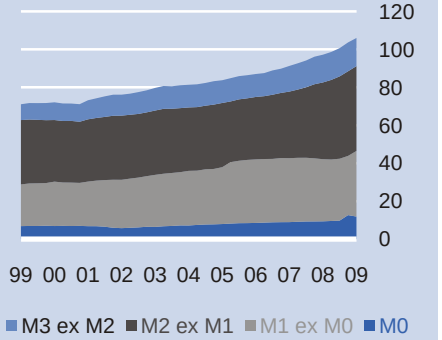
Sources: IHS Global Insight, DB Research 4

Japanese money supply
% of GDP



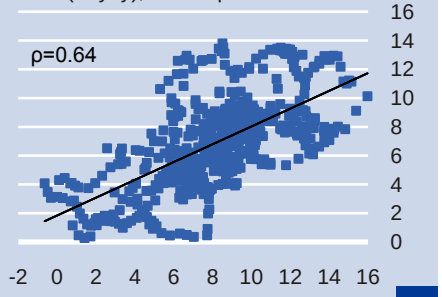
Sources: IHS Global Insight, DB Research 5

Euroland money supply
% of GDP



Sources: IHS Global Insight, DB Research 6

USA: Domestic credit and broad money supply are strongly correlated
X-axis: M2 (% yoy), Y-axis: Domestic credit (% yoy), 1960 - present



Sources: IHS Global Insight, IFS, DB Research 7

2. What is liquidity and how is it created?

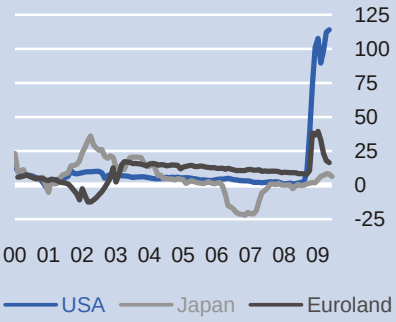
Although there is no general agreement on the proper measurement of liquidity, one could basically distinguish between two concepts: monetary liquidity and market liquidity.[4] Monetary liquidity is associated with macro variables such as interest rates and aggregates of credit and money supply. Market liquidity could be best understood as the degree to which large transactions can be carried out in a timely fashion with a minimal impact on prices.[5] While the first concept is related to financial conditions in broader credit markets, the second one involves micro measures such as market depth, breadth and resilience in various financial segments.

In the following chapters we focus on monetary liquidity, gauged for instance by the supply of money. Generally, the supply of money can be broken down into different types of money based on the central bank's ability to control them by setting official policy interest rates or using other instruments. Narrow money is more or less directly controlled by the central bank's MP (monetar policy) actions. In contrast, broader money is affected less directly by the MP stance. To start with, let us focus on the euro zone. The ECB has full control over the so-called monetary base (M0), the most liquid measure of money supply. M0 consists of money in circulation (notes and coins) and deposits that are held by the private banking sector with the central bank (e.g. minimum reserves). M1 (generally understood as narrow money) consists of M0 and overnight deposits held by the non-financial money holding sector with private banks. The non-financial money holding sector comprises households, corporates and governments. M2 includes M1 as well as time and saving deposits. Finally, the broadest and most illiquid measure of euro zone money supply, M3, comprises M2 as well as repurchase agreements, money market fund shares/units and debt securities with maturities of up to two years. With regard to other big advanced economies, M0, M1, M2 and M3 figures are also available for Japan and Canada. In the US, M3 is no longer reported by the Federal Reserve. Hence, M2 is the broadest US monetary aggregate. In the UK, the BoE distinguishes between narrow and broad money. While UK narrow money includes notes & coins in circulation, British broad money M4 comprises cash outside banks (i.e. in circulation with the public and non-bank firms, private-sector retail/wholesale banks and building society deposits as well as certificates of deposit).

How is liquidity created? M0 is supplied by the central bank and multiplied by the so-called money/credit multiplier. Money creation describes the transformation of the input factor base money into broad money, the final output. Correlation analysis for the US from 1960 until now shows a positive relationship between domestic credit and M2 growth, confirming the money/credit generation process. Generally, the banking sector's willingness to lend, the loan demand, the minimum reserve requirement and the cash coefficient determine by which factor the monetary base is multiplied.[6] During

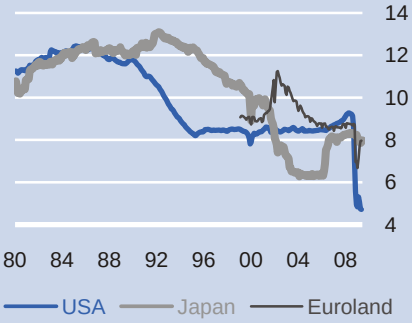
[4] See Baks, Klaas and Charles Kramer (1999).
[5] See Fernandez, Frank A. (1999).
[6] See Anderegg, Ralph (2007), page 69 ff for a more complete discussion on the money/credit multiplier process. The maximum credit multiplier m is given by m=1/{c+r(1-c)} where c is the cash coefficient by the non-financial sector and r the minimum reserve requirement. The lower the cash coefficient and the minimum reserve requirements, the higher the multiplier. At present, the ECB imposes a minimum reserve requirement of 2%. The Federal Reserve's reserve requirement varies with the underlying amount: Zero percent between USD 0 to USD 10.3 m, 3% for more than USD 10.3 m to USD 44.4 m, and 10% for more than 44.4 m.

Major central banks expand their balance sheets
Monetary base (M0), % yoy



Source: IHS Global Insight **8**

Money multipliers fell due to financial crisis
M2/M0, ratio



Sources: IHS Global Insight, DB Research **9**

periods of rapidly expanding credit, money creation generally speeds up. However, during periods of slowing (or even negative) credit growth, money creation slows (or turns negative). In addition to the credit channel, money can be boosted via the bond market channel. Either private banks buy bonds from the non-financial sector, or the central bank engages in non-standard measures, purchasing e.g. government bonds from private banks. However, non-standard measures can also take the form of softer eligibility standards for the possible range of securities used as collateral in open market operations. Additionally, central banks can enlarge the amount and/or the maturity of their open market operations. For instance, the ECB recently introduced new longer-term refinancing operations with a maturity of 12 months. Finally, central banks can purchase covered or corporate bonds to bring spreads down and to directly supply liquidity to the corporate sector.

One possible gauge for the money multiplier is the ratio between broad and base money. For a couple of months now, money multipliers have declined in major economies due to the global banking sector crisis, according to the ratio of M2/M0. In the US, the current slump in the money multiplier has been primarily driven by rapidly expanding M0. The present fall in money multipliers points to frictions in the money creation process. Not surprisingly, the sharp jump in base money has not (yet) led to higher broad money growth as the world economy slipped into recession and both credit supply and demand weakened. However, when the economy finally recovers broad money growth may accelerate again due to a revival in lending. By how much broad money growth will accelerate in the future crucially hinges on how timely central banks start draining their large extra-liquidity injections from the financial system once their economies stabilise again.

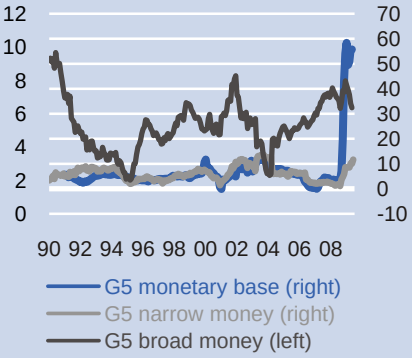
3. Measures of global monetary liquidity

It is difficult to exactly quantify global monetary liquidity as its measurement is fraught with problems. However, there are basically two proxies: price measures, such as global interest rates, and quantity measures such as global money supply aggregates.

Global GDP-weighted versus USD-based money growth

As base money only represents a tiny fraction of the money/credit aggregates which are normally relevant in explaining aggregate demand, it is arguably best to look at broad money. However, as narrow money is generally a leading indicator for broad money and the real economy, we also focus on global narrow money. The fact that the definitions and the data availability for narrow and broad money vary across economies does not make it easier to build a global aggregate. Nevertheless, we propose three global liquidity measures based on monetary aggregates. The first is based on base money, the second on narrow money (using M1 if available[7]) and the third on broad money supply (using the broadest measure for each economy[8]). When constructing these global measures, our focus is on major advanced economies with well developed financial markets only. The countries considered in this note are the 'G5 economies': the US, Euroland, Japan, the UK and Canada.[9]

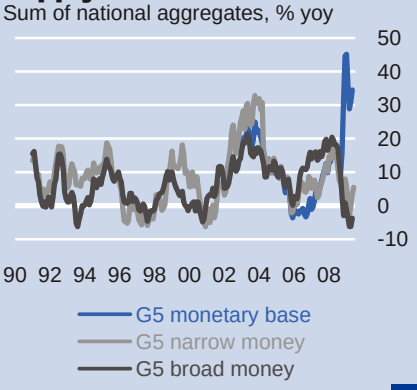
Global GDP-weighted money supply
USD GDP-weighted (2000), % yoy



Sources: DB Research, IHS Global Insight, IMF **10**

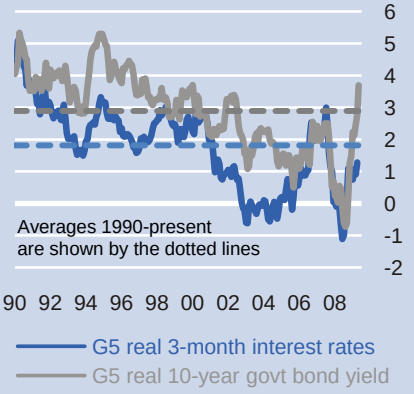
[7] For the UK we used notes & coins in circulation as M1 is not available anymore.
[8] M2 is used for the US, M3 for Japan, Euroland and Canada, and M4 for the UK.
[9] Note that the G5 accounted for 61% of world (USD-based) nominal GDP in 2008.

Global USD-based money supply
Sum of national aggregates, % yoy



Sources: DB Research, IHS Global Insight, IMF **11**

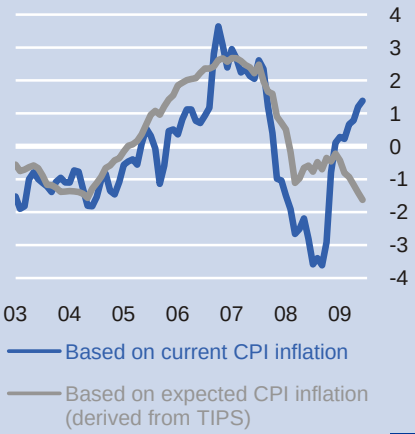
Global real interest rates fell below long-term avg. in the early 2000s
USD GDP-weighted (2000), %



*Nominal interest rates are deflated with headline CPI inflation rates.

Sources: DB Research, IHS Global Insight, IMF **12**

US real interest rates
Based on 3-month US T-Bill yields, %



Sources: IHS Global Insight, DB Research **13**

There are basically two ways to construct global monetary liquidity aggregates. The first method is to convert national money stocks into one single currency, for instance into USD. The growth rate of this USD-based global liquidity stock is easy to construct, straightforward to interprete and may allow us to track global monetary liquidity trends in a timely fashion. The USD-based global liquidity stock is simply the amount of dollars which is ready to be invested in goods and capital markets. Alternatively, we calculate GDP-weighted global money growth rates.[10] The GDP-weighted global money growth rate is the sum of national money growth rates, weighted by the relative share of each economy in total G5 GDP. In contrast to simple USD sums, GDP-weighted money growth is not directly subject to FX rate fluctuations. What really matters to global liquidity growth is the momentum of domestic money growth rates in the G5 economies, weighted by the relative importance of each economy.

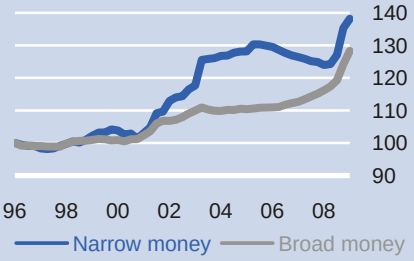
It is interesting to note that both money supply proxies give contradictory indications from time to time. While the USD-based proxy currently points to falling global broad money, the GDP-weighted measure indicates still high broad money growth. Per se it is difficult to judge which measure is the one to consider. As the USD-based figures are to a large extent driven by FX rate fluctuations, global USD-based liquidity growth tends to be more volatile than GDP-weighted money growth. Moreover, the USD-based liquidity aggregate may underrepresent economies with narrower definitions of the money supply. Thus, USD-based global liquidity growth could understate or exaggerate global liquidity trends. Overall, GDP-weighted money growth may give a better picture of the global MP stance, credit trends and the global real business cycle.

Global GDP-weighted interest rates

By using USD-based nominal GDP weights, one could construct many more global liquidity measures such as global nominal or real short-term/long-term interest rates. The rationale behind GDP-weighted global real interest rates is to indicate how cheap it is to borrow in international financial markets after controlling for current or expected inflation. In the case of low or even negative real interest rates, the global monetary policy stance would be seen as being highly accommodative. In the event of rising/high real interest rates the global MP stance would be considered as being restrictive. Indeed, real interest rates have trended lower since the early 1990s. Especially between 2003 and 2005, both short- and long-term real interest rates were significantly below their long-term averages, pointing to overly accommodative global monetary policies. After real interest rates (deflated by current CPI inflation rates) fell into negative territory in mid-2008, they have clearly turned positive since then because of plunging CPI inflation, and in the case of long-term rates, also due to rising bond yields. Although real interest rates are generally good liquidity indicators, they might not be the best gauge for global liquidity during periods of financial stress.

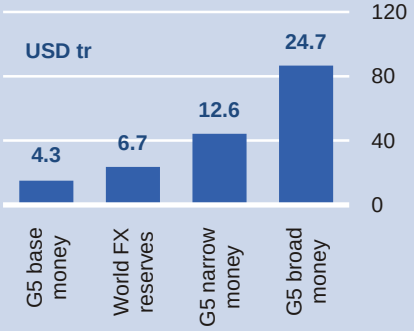
[10] USD nominal GDP weights are as of 2000 (compared to Becker, Sebastian (2007) where 1995 weights were applied). Generally, there are many more ways to construct global money aggregates. Instead of applying USD-based nominal GDP weights, one could for instance use GDP weights based on a purchasing-power-parity (PPP) valuation of country GDPs. Moreover, instead of applying fixed country weights, one could also use rolling nominal GDP-weights.

G5 excess money supply stock remains large*
USD GDP-weighted (2000),
Index: Q1 1996 = 100



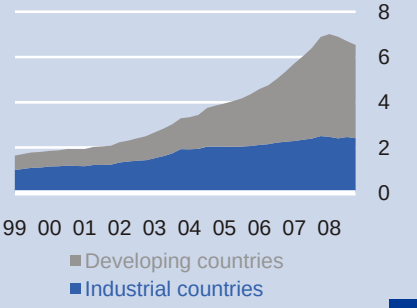
*As measured by percentage yoy money supply growth minus percentage yoy nominal GDP growth.
Sources: DB Research, IHS Global Insight, IMF 14

Global liquidity measures
% of GDP (as of Q4 2008)



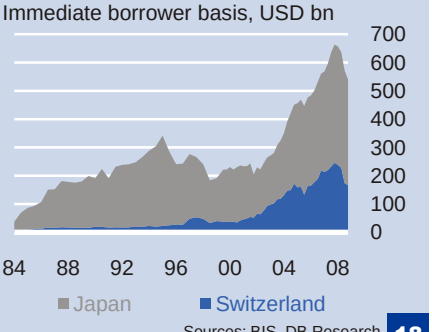
Sources: DB Research, IHS Global Insight, IMF 16

World foreign exchange reserves grew rapidly over the past decade
USD tr



Sources: IMF, DB Research 17

Foreign claims of Swiss and Japanese banks to offshore centres
Immediate borrower basis, USD bn



Sources: BIS, DB Research 18

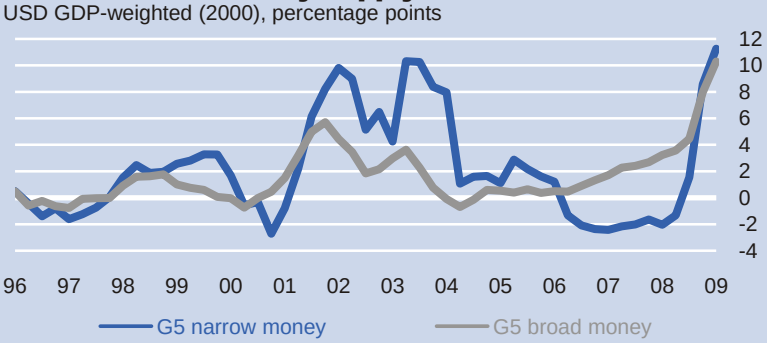
Even if real interest rates are low, developments in loan and bond markets could deteriorate owing to the recession.

4. Sources of global excess liquidity

What is global excess liquidity? How can it be measured? How is it created? What are its sources? In the following we focus on three important sources of global excess liquidity: overly accommodative monetary policies, global imbalances and FX-funded carry trades.

Overly accommodative monetary policies

Global excess money supply creation*
USD GDP-weighted (2000), percentage points



*As measured by percentage yoy money supply growth minus percentage yoy nominal GDP growth.
Sources: DB Research, IHS Global Insight, IMF 15

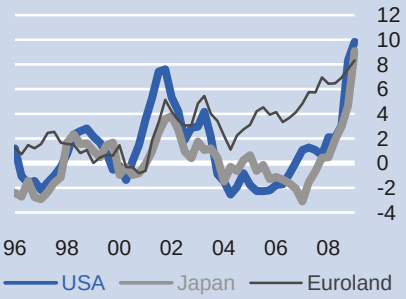
As expanding economies need more money for transaction purposes, global money tends to grow with the economy. Global excess liquidity is often understood as monetary liquidity that is not needed by households, firms and governments to finance real economic transactions such as the sales/purchases of goods or services. Then by definition, excess liquidity is the amount of money that is used to finance transactions in financial asset markets such as bond, equity or real estate markets.[11] In order to assess the creation as well as the stock of global excess liquidity, one might look at the growth rates of world money supply and global nominal GDP as well as at the ratio between both variables.

If money expands permanently faster than nominal GDP, excess liquidity will be created, leading to a rising money-to-GDP stock. Admittedly, the former argumentation is based on two crucial and debatable assumptions. Firstly, that the velocity of money remains constant over time. Secondly, that nominal GDP is a good approximation for the transaction demand for money. Based on these two assumptions, our calculations indicate that global liquidity has indeed grown much faster than global nominal GDP since 1996. In particular since 2000/01 both the narrow and broad money stocks have clearly outpaced nominal GDP. Especially between 2001 and 2003, when world growth weakened and central banks started to inject massive amounts of liquidity into the financial system, our excess liquidity creation indicators jumped to around 6 pp for broad money and more than 10 pp for narrow money, respectively.

At the moment both global narrow and broad money-to-GDP stocks are rising (i.e. in other words global excess money is currently building up) thanks to falling nominal GDP as well as accelerating

[11] This definition is in line with Fels, Joachim (2005).

Global excess broad money creation*
Percentage points



*As measured by yoy broad money growth minus yoy nominal GDP growth.
Sources: IHS Global Insight, DB Research 19

narrow and still positive annual broad money supply growth. The big question is whether we are already seeing the formation of the next global excess liquidity glut. Indeed, excess money is currently building up, at least according to our excess liquidity indicators. Moreover, it appears that excess liquidity creation is currently higher than it was in the early 2000s. By now global narrow (broad) excess liquidity creation has risen to 12 pp (more than 10 pp). As a result, global narrow (broad) excess liquidity has grown by around 40% (30%) since the early 2000s. To sum up, the stock of global excess liquidity remains large and even builds up (gauged by a rising money-to-GDP stock). However, while the jump in excess liquidity creation in the early 2000s was primarily a result of strong narrow and broad money growth, excess money creation now stems to a large extent from falling nominal GDP.

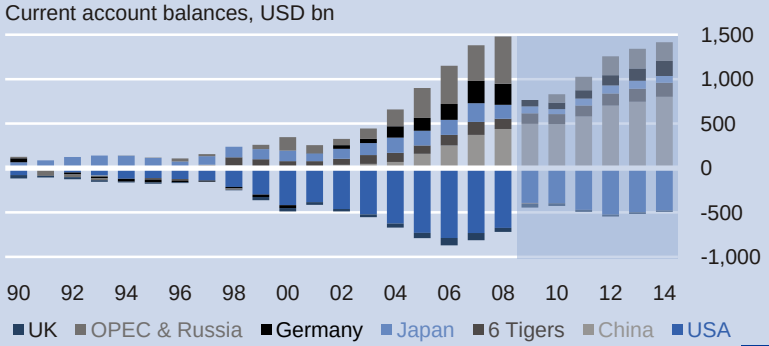
Global imbalances and the savings-glut hypothesis

During the past asset boom, it was often said that a global savings glut had boosted asset prices. The reasoning of this hypothesis is as follows: A savings glut from mainly emerging market economies poured into the developed economies' asset markets, thereby driving asset prices up to unusually high levels. Indeed, owing to growing global imbalances – reflected, on the one hand, by large current account deficits (e.g. in the US, the UK and Southern EMU economies) and, on the other hand, by sizeable current account surpluses in some advanced, emerging and oil-producing economies (e.g. Germany, Japan, China, Russia and the OPEC countries) – world FX reserves grew rapidly over the past decade.

USA: Has an external savings glut caused the fall in long-term interest rates?

*Percentage share of total US marketable public debt held by foreign investors.
Sources: IHS Global Insight, Federal Reserve, DB Research 20

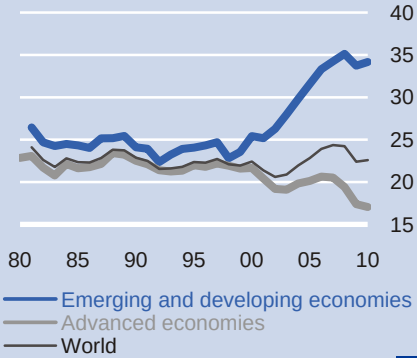
Global imbalances are likely to persist, though at a lower level
Current account balances, USD bn



Forecasts are taken from the IMF WEO Database. Sources: IMF, IHS Global Insight, DB Research 21

According to the advocates of the savings-glut hypothesis, a sizeable part of this (mainly EM) savings glut ultimately flowed back into developed markets (e.g. the US, the UK and Euroland). In their view, low US Treasury yields have been the result mainly of excess savings in EMs which are believed to have driven bond prices up and yields down. Indeed, the fall in both nominal and real long-term US Treasury yields over the past decade coincided with a rising market share of foreign investors in total US Treasuries outstanding. To be precise, the share of foreign ownership in total US marketable government debt outstanding climbed to 28.7% in May 2009, from around 20% in the early 2000s.

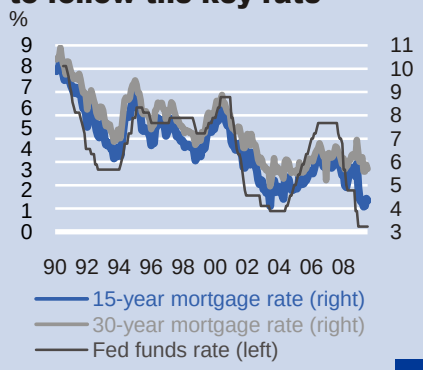
EMs vs DMs: Savings have diverged for many years
Savings, % of GDP



Source: IMF 22

Overall, it might well be the case that excess savings in emerging markets and the resulting re-investment pressure on developed economies' asset markets contributed to the pronounced fall in US long-term interest rates between 2000 and 2004. Nevertheless, a simple graphical depiction of the US Fed funds rate and selected US

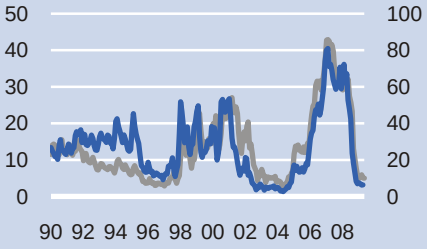
USA: Mortgage rates tend to follow the key rate



Sources: IHS Global Insight, DB Research 23

Foreign banks cut back their JPY borrowings

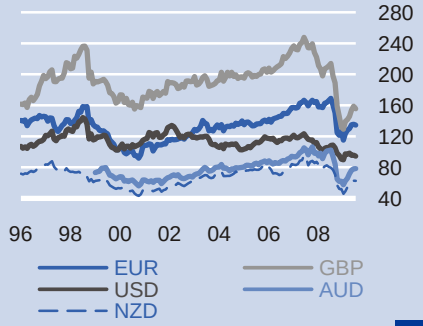
Average amount borrowed by foreign banks in the Japanese money call market



Sources: BoJ, IHS Global Insight, DB Research 24

Rapid JPY appreciation vs. many currencies

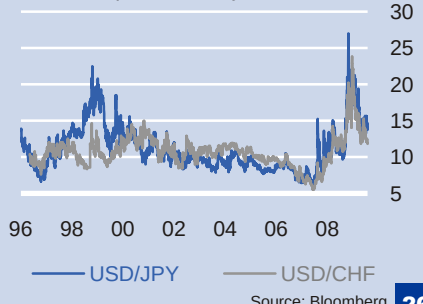
JPY per foreign currency



Sources: IHS Global Insight, DB Research 25

FX volatility shot up

3-month implied volatility, %



Source: Bloomberg 26

long-term market interest rates (as e.g. 15-year and 30-year fixed mortgage rates) rather suggests that the Federal Reserve's monetary policy stance was the major driver behind low US market interest rates. Correlation analysis confirms that US mortgage rates and US Treasury yields have both been strongly positively correlated with the official policy rate since the early 1990s. Although global imbalances and the corresponding rise in world FX reserves are likely to have contributed to very favourable liquidity conditions prior to the crisis, the savings-glut hypothesis does not seem to tell the full story. Instead, what really caused global excess liquidity might have been the combination of very accommodative monetary policies in advanced economies between 2002-2005 coupled with fixed or managed floating exchange rate regimes in major emerging market economies such as China or Russia. Consequently, emerging markets implicitly imported at that time the very accommodative MP stance of the advanced economies. As a result of the large current account surpluses in these economies and the central banks' measures to stabilise the FX rate, total world foreign exchange reserves more than quadrupled to USD 7 tr in Q2 2008 from just USD 1.6 tr in Q1 1999. While FX reserves held by emerging markets skyrocketed during the same period to USD 4.5 tr from just USD 0.6 tr (+626%), FX reserves by developed markets grew at a much slower rate to USD 2.5 tr from USD 1 tr (+152%). Overall, the specific combination of sharp monetary easing in big advanced economies between 2000 and 2004 as well as rapid FX accumulation by emerging markets very likely depressed US long-term interest rates.

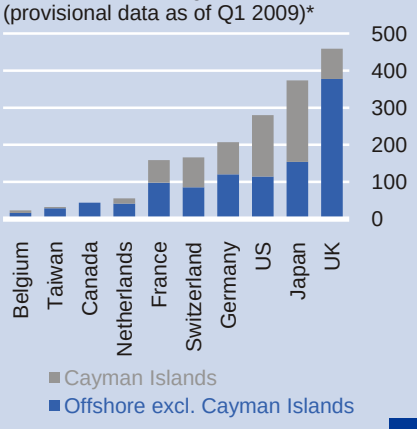
FX carry trades: global source of cheap money

Apart from accommodative MP in advanced economies and rapidly rising FX reserves, huge interest rate differentials between major economies might have also boosted global excess liquidity prior to the credit crisis. In particular, chronically low nominal interest rates in the world's second largest economy, Japan, as well as in the financial-services-driven Swiss economy encouraged risk-taking investors to engage in FX-funded carry trade speculation. An FX carry trade describes a strategy in which investors borrow cheaply in low-yielding funding currencies in order to re-invest this money in higher-yielding, so-called target currencies. As long as the funding currencies remained weak and the interest rate gap positive, carry traders gained high returns.

For many years prior to the sub-prime crisis, FX markets were subject to low market volatility by historical standards. Hence, JPY and CHF-funded carry trades offered relatively high returns at only limited FX risks. In light of buoyant GDP growth, abundant global liquidity, high investor risk appetite, surging asset prices and low financial market volatility, JPY and CHF carry traders benefited both from considerable interest rate differentials and significant exchange rate gains thanks to an ever weaker Japanese yen and Swiss franc.

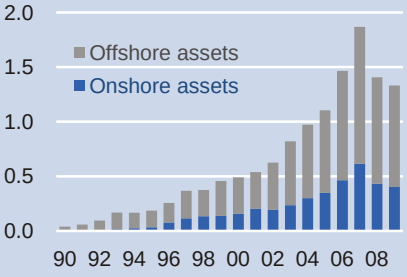
Although global carry trades are difficult to track and their total size is even more demanding to quantify, empirical evidence suggests that JPY and CHF-funded carry trades had grown rapidly in the years prior to the credit crisis. Concerning JPY-funded carry trades, foreign banks' borrowings in the Japanese money call market had grown significantly in the run-up to the crisis, reaching more than USD 80 bn in the first half of 2007 and above 40% of total money market borrowings. However, since mid-2007 foreign banks have rapidly cut back their JPY borrowings as the interest rate differential

Consolidated foreign claims of BIS reporting banks to offshore centres
Amounts outstanding, USD bn
(provisional data as of Q1 2009)*



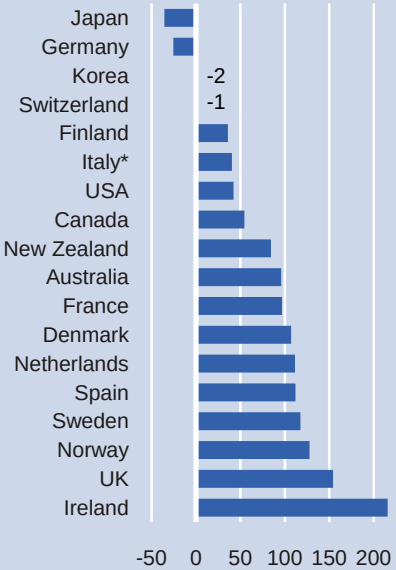
* Immediate borrower basis. Sources: BIS, DBR 27

Assets under management by hedge funds industry
Estimated assets, USD tr



Latest 2009 number is as of Q1.
Source: HFR (HFR Industry Reports) 28

Real house prices
Change 1995-2008, %



*1995-2007. Sources: OECD, DB Research 29

between the JPY and main target currencies shrank dramatically and FX volatility spiked to unprecedented levels.

Meanwhile, foreign banks' borrowing in the Japanese money market retreated to less than USD 10 bn, dragging the market share down to 5%. Another way to track JPY-funded carry trades is to look at the Bank for International Settlements' consolidated foreign bank lending statistics. As many hedge funds reportedly have their offices in financial offshore centres and were said to have engaged in FX carry trades, another gauge for FX carry trades is the lending from low-yielding economies to these offshore centres. Indeed, both Japanese and Swiss banks actually built up large consolidated foreign claims against offshore centres over the past couple of years, suggesting that offshore centres were taking advantage of low interest rates in Japan and Switzerland. Interestingly, foreign claims by Swiss and Japanese banks versus offshore centres grew at a much stronger pace than their credit claims against any other region. Moreover, this expansion in foreign lending coincided with hedge fund assets rising to more than USD 1.8 tr in 2007.

In particular, foreign claims of Japanese and Swiss banks to the Cayman Islands had grown significantly between 2003 and 2005, i.e. during the time of JPY and CHF weakness. Overall, JPY and CHF carry trades possibly amounted to more than USD 660 bn in Q1 2008, according to total lending by Swiss and Japanese banks to offshore centres. But since then total foreign lending by Swiss and Japanese banks has fallen below USD 600 bn. In an international comparison as of Q1 2009, Japan still stands out with claims of around USD 220 bn against the Cayman Islands and a corresponding lending share of around 29%.[12]

5. Global excess liquidity and asset prices

Has global excess liquidity fuelled asset prices instead of consumer price inflation? Over the past few years global excess liquidity and its impact on asset price inflation as well as its risks to the real economy have increasingly attracted the attention of policymakers, not least after the bursting of the credit bubble. In this regard, it remains highly controversial whether central banks should not only look at CPI inflation but also consider asset price inflation in their MP decisions. In other words, the burning issue is whether central banks should act preventatively to avoid asset price bubbles (leaning against the wind) as the bursting of speculative bubbles implies severe downside risks to the real economy.[13]

Although CPI inflation tended to increase with a certain time lag to higher money growth even in the past cycle, both headline and core CPI inflation rates remained relatively moderate, especially in view of surging global money supply after the IT dotcom crash. Last year's jump in headline CPI inflation due to soaring oil prices confronted CBs (central banks) and consumers with the highest annual CPI inflation rate in more than a decade, but proved short-lived as recession kicked in and commodity prices plunged back. Currently, inflation rates are close to zero or even negative. In light of low CPI inflation rates and abundant global money supply, the question remains where the excess liquidity has gone. The

[12] For more FX carry trade indicators see Becker, Sebastian (2008).
[13] See Tumpel-Gugerell (2009).

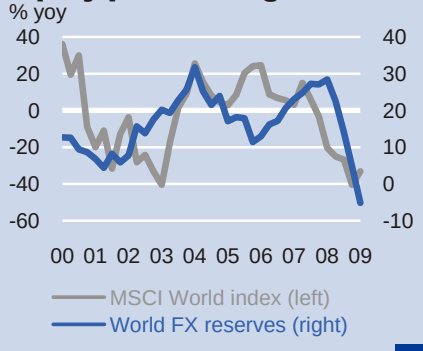
Global narrow money vs. stock prices
*USD GDP-weighted (2000), % yoy

Sources: DB Research, IHS Global Insight, IMF 30

Global broad money vs. stock prices
*USD GDP-weighted (2000), % yoy

Sources: DB Research, IHS Global Insight, IMF 31

World FX reserves vs. equity price changes
% yoy



Sources: IHS Global Insight, IMF, DB Research 32

widespread answer is that it poured into bond, equity and housing markets and thus fuelled an asset price bubble.

There are a few academic studies on the relationship between global excess liquidity and asset prices. Giese and Tuxen (2008) conclude that a surge in global excess liquidity in 2001 depressed bond yields and raised house prices but had only a limited impact on equity prices.[14] Belke, Orth and Setzer (2008a) conclude that abundant global liquidity contributed to the sharp rise in house prices over recent years that finally culminated in the subprime crisis. According to their VAR analysis on OECD countries, both house and consumer prices are determined by global monetary conditions. However, while consumer prices react only with a significant time lag to a liquidity shock, changes in global liquidity lead to relatively fast responses in global house prices.[15] Moreover, Belke, Orth and Setzer (2008b) find subsequent spill-over effects from house prices to the overall price level but are not able to confirm that stock prices significantly react to changes in global liquidity.[16] However, research by Baks and Kramer (1999) suggests that an increase in G7 liquidity is consistent with a decline in G7 real interest rates and an increase in G7 stock returns.[17] Against the backdrop of academic research in this area, we want to review the role of global excess liquidity behind the previous asset price boom with a focus on bond, equity, real estate and commodity markets.

Equity markets

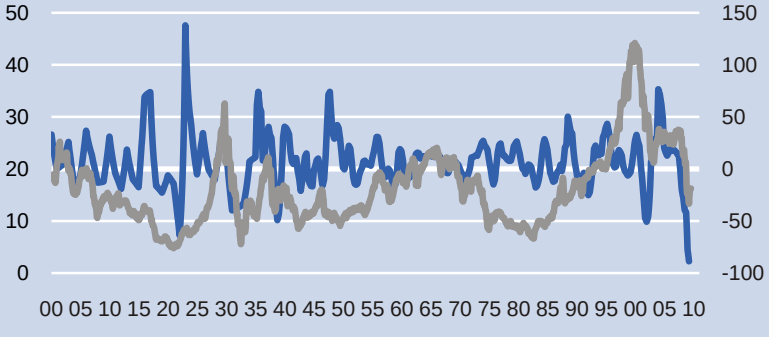
A look at our global money supply aggregates suggests there was no immediate effect of the strong 'early 2000s' money growth on world stock returns as measured by the MSCI World index. However, it seems that there was a lagged effect: as long as investors' risk aversion (gauged by e.g. the VIX implied volatility index) was high due to increased economic uncertainty, excess liquidity did not pour into equity markets. The strong acceleration of global broad money growth between 2001 and 2003 had no immediate impact. Precisely, it took more than two years of strong money supply growth to feed through to stock market returns. With regard to the current market period, it seems that the past years' sharp and protracted deceleration in global narrow money growth which ended in early 2008 could well continue to weigh on equity price performance for some more time.

In the following, we are interested in whether the past few years' stock market boom was mainly driven by improved fundamentals or predominantly due to global excess liquidity. In order to assess whether stock markets are over- or undervalued, one can look at price/earnings (P/E) ratios. In theory, a company's stock price equals the present value of future cash flows. P/E ratios can be based on past, current or expected earnings. The higher (lower) the P/E ratio, the more expensive (cheaper) the stock price. Generally, markets look at P/E ratios based on expected future earnings, i.e. the 12-month forward P/E ratios. As a disadvantage, forward-looking P/E ratios crucially hinge on earnings forecasts and are subject to uncertainties about the economic outlook. Hence, such P/E ratios can change relatively quickly due to forecast revisions. Especially during financial turmoil and increased economic uncertainty, forward-looking P/E ratios may become less reliable. Therefore, it

[14] See Giese, Julia V. and Christin K. Tuxen (2008).
[15] See Belke, Ansgar Hubertus, Walter Orth and Ralph Setzer (2008a).
[16] See Belke, Ansgar Hubertus, Walter Orth and Ralph Setzer (2008b).
[17] See Baks, Klaas and Charles Kramer (1999).

might make sense now to look at P/E ratios based on past earnings trends (e.g. gauged by rolling P/E ratios). In the following, we rely on the P/E ratio for the S&P composite index, which is taken from Robert J. Shiller and based on past earnings trends.[18]

USA: S&P composite earnings slumped

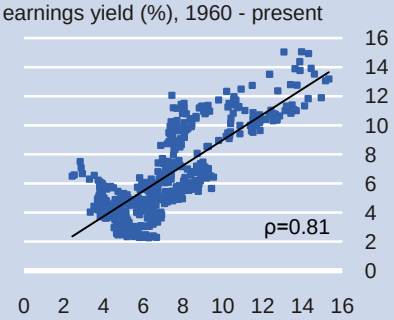


Sources: Robert J. Shiller, DB Research 33

In contrast to the late 1990s/early 2000s, P/E ratios did not rise in the US prior to the credit crisis, contradicting the view that stock markets were becoming overheated at that time. Rather, the P/E ratio of the S&P composite index remained fairly constant despite sharply climbing stock prices thanks to extraordinarily strong profit growth. Nevertheless, the P/E ratio stood at more than 27 prior to the crisis. This was clearly above its long-term average of around 16, suggesting that US equities were expensive rather than cheap, at least compared with historical earnings. In this regard, it might be worth looking at P/E ratios before selected financial crises. Although P/E ratios prior to the current crisis were much lower than before the bursting of the IT bubble in early 2000, they were only slightly lower than prior to the Great Depression in 1929.

S&P500 earnings yield vs. long-term interest rates

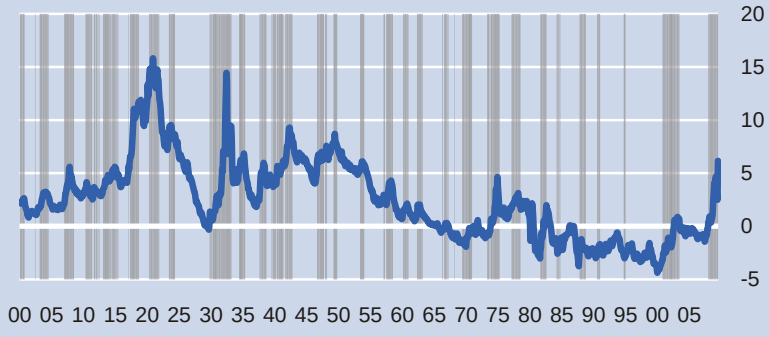
X: Long-term interest rate (%), Y: S&P500 earnings yield (%), 1960 - present



Sources: Robert J. Shiller, DB Research 34

USA: S&P composite earnings yield premium

S&P earnings yield above long-term interest rates, percentage points

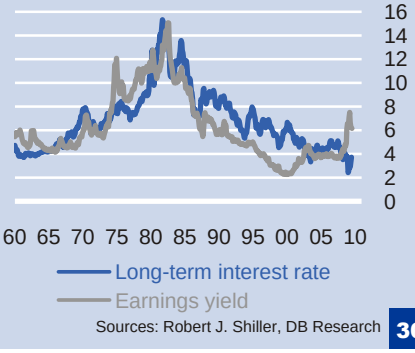


Shadows mark periods with negative % yoy equity price performance.

Sources: Robert J. Shiller, DB Research 35

S&P comp.: Earnings yield and long-term interest rate have diverged recently

%



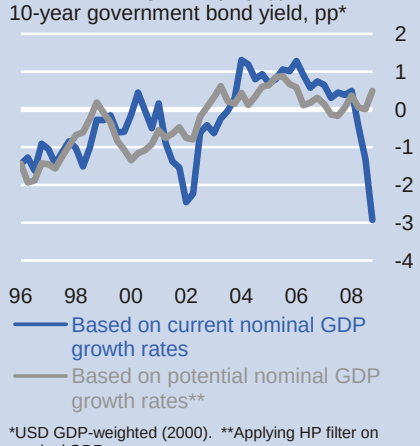
Sources: Robert J. Shiller, DB Research 36

Alternatively to the above assessments, one could run a comparative analysis, comparing the S&P's equity market earnings yield with the yield on long-term US Treasuries. The equity market earnings yield is computed as the reciprocal value of the P/E ratio. Generally, one would expect a positive risk premium on equity investments relative to safe government bonds. Hence, the earnings yield should be higher than the US Treasury yield. In line with

[18] See Shiller, Robert J. (2008). For a detailed description on Robert J. Shiller's stock market data please see http://www.econ.yale.edu/~shiller/data.htm.

G5: Gov't bond yields vs. nominal GDP growth

Nominal GDP growth (% yoy) minus 10-year government bond yield, pp*

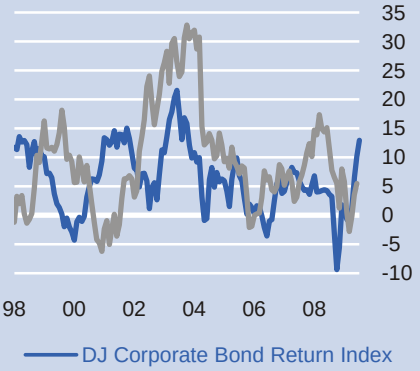


*USD GDP-weighted (2000). **Applying HP filter on nominal GDP.

Sources: DB Research, IHS Global Insight, IMF 37

Global money supply vs. corporate bond returns

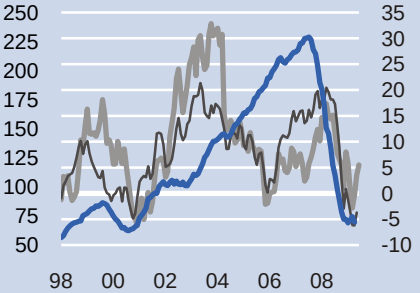
% yoy



Sources: IHS Global Insight, Dow Jones, DBR 38

Corporate bond issuance vs. global money supply

*USD-based



Sources: IHS Global Insight, Federal Reserve, DBR 40

expectations, the risk premium was strongly positive between 1880 and the mid-1960s. However, since then it has been mostly negative, reaching a floor in the late 1990s/early 2000s. Only recently has the risk premium turned strongly positive owing to the pronounced equity market sell-off in late-2007 and the sharp, 'flight-to-quality-driven' drop in US Treasury yields.

Government bond markets

Government bond yields (prices) have been too low (high) on a global level, according to a simple bond market valuation model. Generally, the yield of a long-term government bond should move in line with nominal GDP growth. This argumentation is based on the thought that the nominal yield of a long-term risk-free bond should earn roughly as much as the underlying economy yields over time. As shown, our G5 GDP-weighted 10-year government bond yield was below nominal GDP growth between late 2003 and early 2008. In particular, US government bonds yields appeared to be too low between mid-2003 and end-2006. However, since the start of the credit crisis the picture has changed completely. On the one hand, major economies fell into deep recession. On the other hand, the re-pricing of risk led to a flight to quality, pushing government bond yields to even lower levels. Meanwhile, the difference between nominal GDP growth and long-term government bond yields has turned strongly positive suggesting that the past overvaluation of government bond prices has finally ended. Interestingly, the same analysis based on potential (instead of current) nominal GDP growth points to still overvalued government bond prices. Moreover, bonds looked especially expensive between late 2003 and early 2008. Although the growth-yield gap roughly closed in early 2007 it has widened again since then.

Corporate bond markets

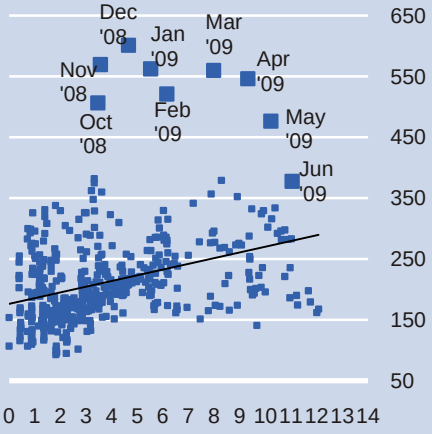
Global short-term interest rates vs. Moody's medium-term corporate spec-grade bond spreads

*USD GDP-weighted (2000). Sources: DB Research, IHS Global Insight, IMF, Moody's 39

Before the bursting of the credit bubble, abundant global liquidity had obviously contributed to falling corporate bond yields. As shown above, the spike in G5 USD-based narrow money growth in the early 2000s coincided with rising corporate bond returns. Furthermore, the drastic monetary policy easing after the bursting of the IT bubble apparently contributed to the sharp fall in US corporate bond spreads between 2003 and 2007. It needed roughly two years of sharp monetary easing until the positive effects of low interest rates led to a gradual tightening in cash bond spreads.

USA: Credit spreads* vs. default rates**

X-axis = Corp spec-grade default rate, %
Y-axis = Corp Baa spreads vs. UST, bp

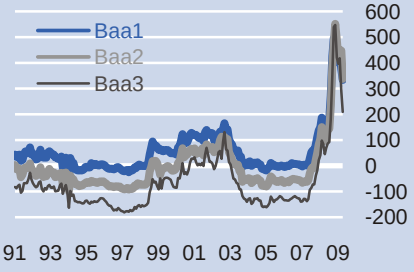


Monthly data: 1970-present. *Based on Moody's US long-term seasoned bond yields. **Based on Moody's 12-month trailing issuer-weighted US speculative-grade default rate.

Sources: Moody's, DB Research 41

US non-financial Baa corp bond spreads: From under- to overcompensation

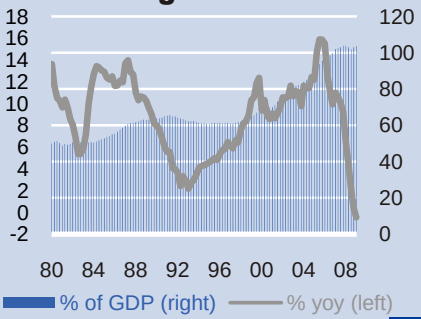
(+) overcompensation, (-) undercomp. for historical default risk, bp



Analysis is based on Moody's medium-term non-financial corporate bond yields as well as annual average defaulted bond recovery and cumulative issuer-weighted global default rates. Data is for the period 1983-2007.

Sources: DB Research, Moody's 42

USA: Mortgage debt outstanding



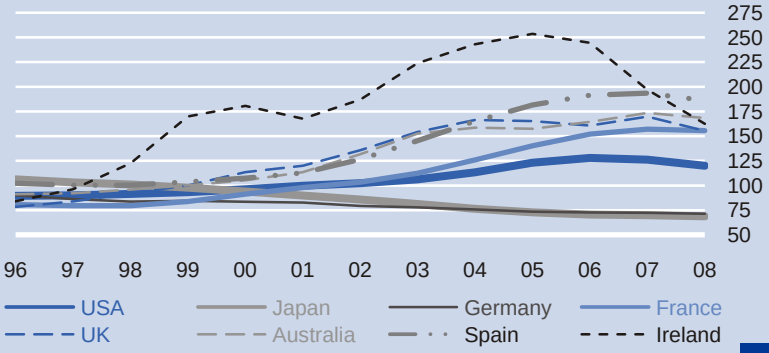
Sources: Federal Reserve, IHS Global Insight, DBR 44

With regard to fundamental factors, such as earnings growth and default rates, the sharp compression in credit spreads between 2002 and 2007 was also boosted by exceptionally strong earnings growth as well as historically low bond default rates. After Moody's global speculative-grade corporate default rate had hit a peak of around 10% in late 2001, it fell sharply thereafter to a multi-decade low of just 0.9% in November 2007. Nevertheless, one should bear in mind that easy access to credit and overly low re-financing costs were instrumental in keeping default rates low. Overall, both favourable liquidity conditions and strong fundamentals tied refinancing costs down at very low levels. Interestingly, corporate bond yields did not compensate for historic default risk in the years prior to the crisis (i.e. between 2003 and mid-2007), according to our analysis based on Moody's medium-term corporate bond yields as well as Moody's global corporate issuer-weighted cumulative default rates and recovery rates. Especially high-yield bond spreads looked too low compared to historic default risk.[19] When the credit bubble had burst, investors rapidly demanded much higher spreads because of abating risk appetite and increased economic uncertainty. Yields shot up in anticipation of soaring default rates and corporate IG bond yields were mostly overcompensating for historic default risks owing to extreme uncertainty about future earnings and default rate developments. In the primary market a look at US corporate bond issuance shows that issuance activity benefited from strong global money growth in the early 2000s.

Real estate markets

House prices outpaced rents in many countries

Price-to-rent ratio, long-term average = 100

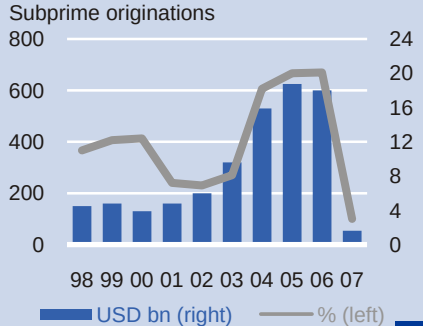


Source: OECD 43

Over the past decade house prices grew at very high rates in many countries. Moreover, the rapid house price growth in these countries was accompanied by rising price-to-rent and price-to-income ratios, suggesting that residential home markets possibly became overvalued. Nowadays, there is widespread consensus among economists that the US housing market has been the epicentre of the current global crisis. Especially, the development of innovative complex securitised products, the lack of due diligence by originators of loans that were securitised, unduly raised expectations of perpetual increases in house prices from both households and lenders were crucial micro factors behind the developments of the US housing bubble. As regards liquidity, the very accommodative MP stance in major economies and the corresponding surge in

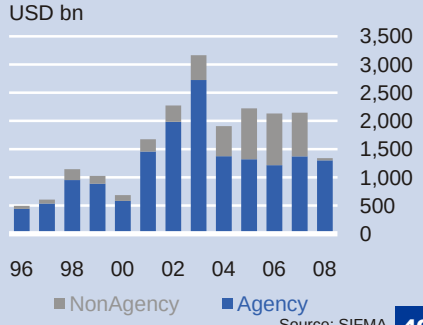
[19] This analysis is based on the same ideas as presented in Becker, Sebastian (2009), page 6.

USA: Subprime mortgage market
Subprime originations



Source: OECD 45

USA: MBS-related issuance
USD bn

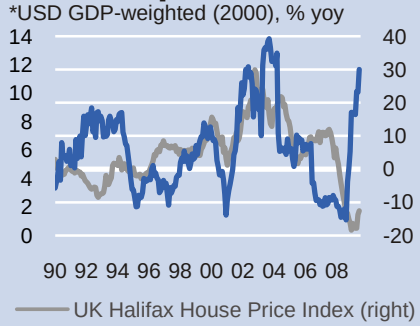


Source: SIFMA 46

G5 real interest rate vs. US house price changes

*USD GDP-weighted (2000).
Sources: DBR, IHS Global Insight, IMF, S&P's 47

Global liquidity growth vs. UK house price inflation
*USD GDP-weighted (2000), % yoy



Sources: DB Research, IHS Global Insight, IMF 48

global excess liquidity further boosted the formation of the house price bubble. In addition to the US, the bursting of the house price bubbles in some European countries also weighed heavily on their economies and hence global GDP. In this section we look at the potential role of global liquidity in the developments of the former US and European house price bubbles.

Both the US and UK real estate markets seem to offer some evidence that ample liquidity was (at least) an additional driver behind strong pre-crisis house price growth, not least through low mortgage rates. Overall low re-financing costs coincided with strong mortgage growth. Moreover, surging credit, high risk appetite and a search for yield spurred issuance activity of mortgage-backed securities, not only in the prime but also in the subprime market segment. As a result of increased loan securitisations, the banking sector's scope to increase credit was instrumental in boosting mortgage lending. As apparent, US mortgage debt outstanding rose to around 104% of GDP from around 60% in the late 1990s. It is worth noting that the big jump in the mortgage-to-GDP ratio occurred between the early 2000s and 2007. Now with the house price bubbles having burst, it seems that the ongoing slump in US and UK home prices may also be partly driven by the sharp deceleration in global narrow money growth between 2003 and 2008, though primarily by rising default rates and a re-pricing of risk. Although US house prices keep falling on an annual basis (though the pace of deceleration has eased recently), US MBS yield spreads versus US Treasuries have already narrowed back significantly from multi-year highs mainly thanks to credit easing by the Federal Reserve.

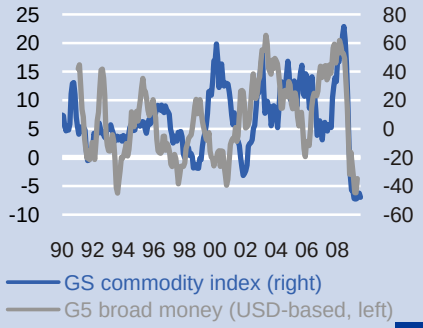
Commodity markets

Finally, the past rally in commodity prices is often (at least partly) attributed to the global liquidity glut and the associated search for yield as speculators invested money in the commodity segment in order to benefit from soaring energy prices. A simple chart plotting our USD-based broad money supply figure against the GS commodity price index (as well as versus the WTI oil price) shows that liquidity could have been at least an additional driver of the last commodity price rally. Interestingly, accelerating USD-based money supply growth preceded the jump in the oil price during the last oil price cycle. Had global excess liquidity played a role in the past oil price rally, it would have had at least an indirect effect on global headline consumer price inflation via rising commodity prices. Moreover, in view of volatile commodity markets this would mean that CPI inflation could become more volatile.

6. Outlook for global excess liquidity and asset price inflation

Will global excess liquidity continue to rise in the wake of expanding central bank balance sheets? Or will global excess liquidity be cut back due to softer lending? As discussed in the previous chapters, global excess liquidity is generally understood to be monetary liquidity that is not used for real economic transactions. Whenever the global money stock grows faster than nominal GDP (which accounts for increased transaction demand for money due to rising real output and price increases), excess liquidity is created. Given that global liquidity has grown faster than nominal GDP over the

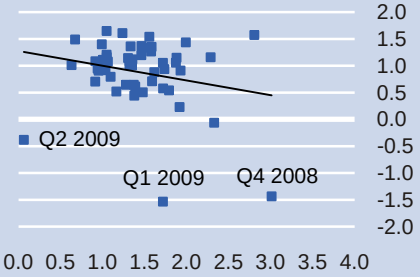
Global money growth vs. commodity prices



Sources: IHS Global Insight, DB Research 49

G5 excess broad money supply creation*

X-axis: Broad money (% qoq), Y-axis: Nominal GDP (% qoq), 1996 - present

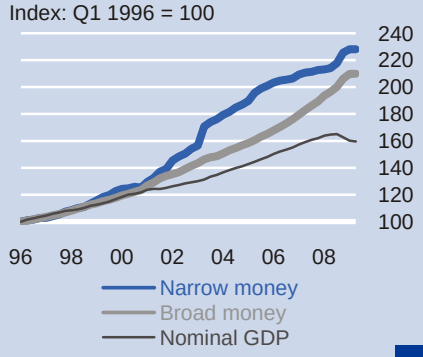


*USD GDP-weighted (2000).

Sources: DB Research, IHS Global Insight, IMF 50

G5: Money supply outpaced nominal GDP

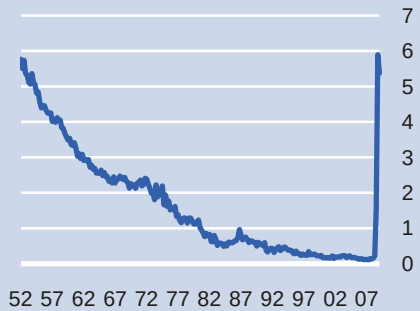
USD GDP-weighted (2000), Index: Q1 1996 = 100



Sources: DB Research, IHS Global Insight, IMF 51

USA: Commercial bank reserves at the Fed

% of GDP



Sources: IHS Global Insight, Federal Reserve, DB Research 52

past decades (though there were some periods when it grew less strongly), the stock of global excess liquidity has grown persistently over the years. In the following, we discuss two possible scenarios for the medium-term outlook for global excess narrow and broad liquidity. Moreover, we analyse what this could potentially mean for future CPI and in particular asset price inflation.

Scenario 1: Global excess liquidity keeps rising

When talking about excess liquidity it is always important to know which definition and money supply aggregate one is referring to. With regard to the global supply of narrow money, excess liquidity – defined as a rising money-to-GDP ratio – has started to grow significantly for the past couple of months. The current creation of narrow excess liquidity has been driven by two factors: (1) accelerating narrow money growth as well as (2) shrinking nominal GDP due to real economic contraction and rapidly falling or even negative inflation (according to GDP deflators) in major advanced economies.

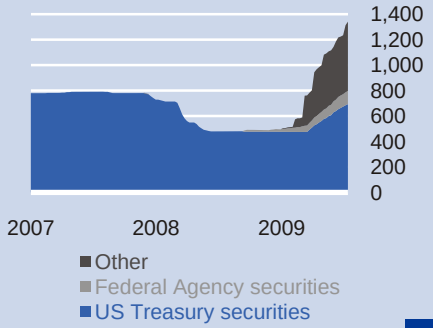
The very recent re-acceleration of narrow money (M1) growth was driven primarily by rapidly expanding central bank balance sheets. This is particularly true of the US. Noticeably, US commercial banks are currently reported to hold deposits at the Fed worth almost 6% of US GDP, a steep increase from an average of 0.3% of GDP over the past two decades. These sizeable excess reserves by US commercial banks with the Federal Reserve suggest that the Fed's extra-liquidity injections have not (yet) been transformed into new credit and hence money. Rather it has mostly stayed within the US banking sector for now, pointing to frictions in the credit creation process. In the euro zone, the ECB has been increasingly engaged in policies labelled as enhanced credit support. In late June the ECB provided a record amount of EUR 442 bn (around 5% of euro-area GDP) of liquidity to euro-area-banks for the first time with a lengthening of the maturity to 12 months. Although these extra liquidity injections helped to bring money market spreads down again, large parts of these extra liquidity injections have still remained within the banking system and were actually deposited with the ECB again. Having said this, the ECB's president Jean-Claude Trichet (2009) expects that it may take some time for the extra liquidity to be transformed into credit.[20]

Although the central banks' extra-liquidity injections are at the moment urgently needed to support the banking sector, the credit channel and hence the overall economy, they involve the risk that credit and money could surge at a future point in time to undesired high levels once the economies and hence lending stabilise again. Therefore, central banks need to pull the extra money out of the system when the credit multiplier process normalises eventually and before it starts running hot. Time will tell whether the current surge in DM's base money will have an undesired, long-term effect on credit and money supply. As long as the rising narrow money growth does not translate into undesired high credit growth (i.e. as long as the credit channel is blocked), the surge in base/narrow liquidity should not lead to a strong acceleration in broad money growth. Should the CBs exit strategies succeed, then the current extra-liquidity injections might overall be beneficial for the economy because they would support credit at times of financial turmoil without boosting credit and money to unsustainable, excessively high levels over the

[20] Trichet, Jean-Claude (2009).

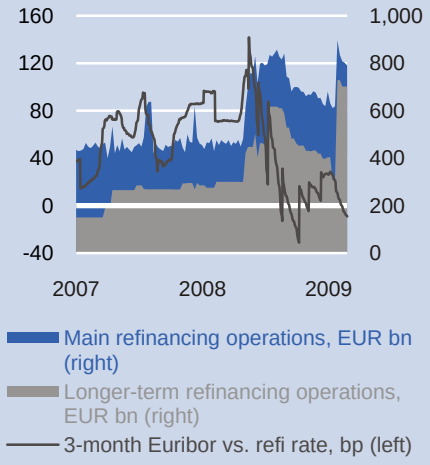
USA: Securities held outright by the Fed

USD bn



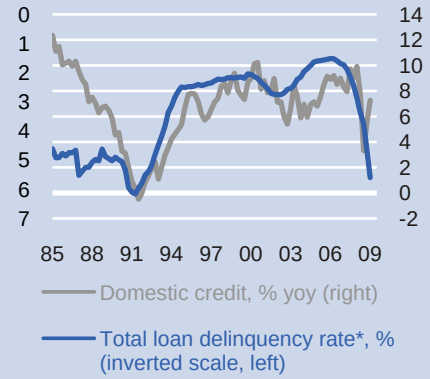
Sources: Federal Reserve, IHS Global Insight 53

EMU: Large ECB liquidity injections brought money market spreads down



Sources: IHS Global Insight, ECB, DB Research 54

USA: Rising delinquency rate remained a drag on domestic credit growth



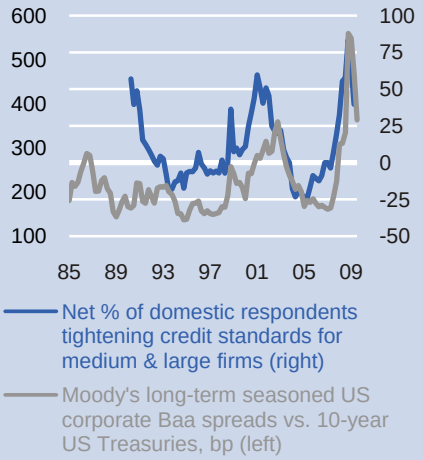
*Of US commercial banks.
Sources: IHS Global Insight, Federal Reserve, DBR 55

medium to long term. Although central banks should be able to withdraw large parts of their (temporary) extra-liquidity programmes by simply not rolling them over, the central banks' commitment as well as timing remains crucial for success. Moreover, some non-standard central bank measures (such as the Fed's outright purchases of US Treasuries, agency debt as well as mortgage-backed securities or the ECB's outright purchases of covered bonds) might be more difficult to reverse quickly. Although central banks have a wide range of possible instruments to re-absorb today's extra-liquidity injections whenever this becomes necessary at a later point, only the future will tell whether they started to act in a timely fashion. Given that central banks will try hard to avoid any further setback in economic activity, monetary policies could again turn out to be too accommodative for too long.

Overall, the ECB should generally be less hesitant than the Fed in withdrawing money from the system when this becomes necessary in the future for the following reasons. Firstly, the ECB has applied fewer non-standard measures than the Fed. Secondly, the total size of the ECB's non-standard measures has been smaller. In particular, the planned outright purchases of covered bonds of around EUR 60 bn appear comparatively small. Thirdly, the ECB has a single mandate to ensure CPI stability. To be precise, the ECB is in charge of keeping CPI inflation below, but close to 2% p.a. over the medium term. In contrast to the ECB, the Federal Reserve has a dual mandate of achieving stable CPI inflation and maximum employment. Given that the Fed's dual mandate generally involves a trade-off between preventing rising CPI inflation and promoting growth, the Fed has to manage the balancing act of withdrawing enough, but not too much money from the system, and of preventing both a jump in CPI inflation and an undesired setback in the economic recovery. In this regard, chairman Bernanke noted that the Fed still needs to engage in credit easing for a while. However, he also indicated how the Fed could drain money at a future stage. One measure could be a parallel increase in the Fed funds rate as well as in the interest rate paid on the banking sectors' excess reserves at the Fed. By hiking the deposit rate above interbank money market rates, the Fed would give banks incentives to deposit their excess reserves with the Fed instead of using them for credit expansion.

All in all, it is not implausible to believe that the global narrow money-to-GDP ratio will keep growing over the next few years as monetary policies are likely to remain accommodative rather than restrictive and economic growth relatively moderate. As regards our GDP-weighted broad money indicator, excess liquidity has never been cut back for a longer period in recent history. Although broad excess liquidity was actually cut back in a few instances (e.g. in the late 1990s as well as in 2000 and 2004), these reductions were only marginal and short-lived. Consequently, broad excess liquidity continued to rise. Although the money creation process has softened markedly, as evidenced by falling money multipliers and cooling broad money growth in most major economies, it remains unlikely that this will be the start of a long-lasting, sharp and broad-based decline in credit and money. Hence, though broad money may grow at a much lower rate than in the past few years (or even turn negative for a while), global broad excess liquidity may still keep rising due to negative or only meagre GDP growth.

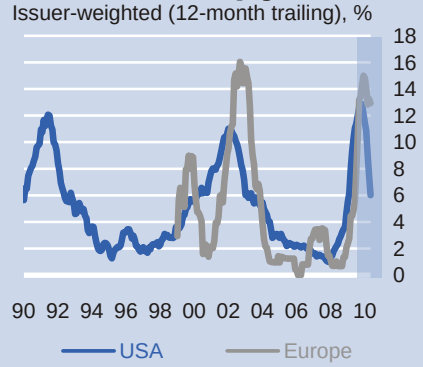
USA: Credit standards tightened, credit spreads widened ...



Sources: Federal Reserve, IHS Global Insight, Moody's, DB Research 56

... and Moody's spec-grade corporate default rates have risen sharply

Issuer-weighted (12-month trailing), %

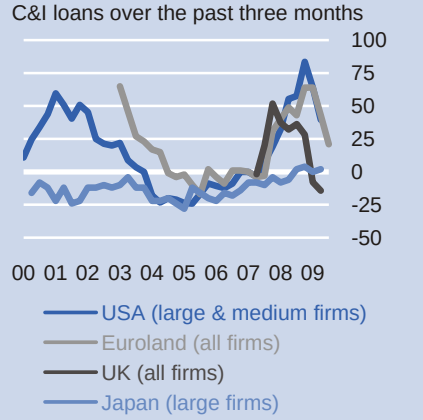


Forecasts are by Moody's.

Source: Moody's 57

Credit standards tightened

Net % of banks tightening standards for C&I loans over the past three months



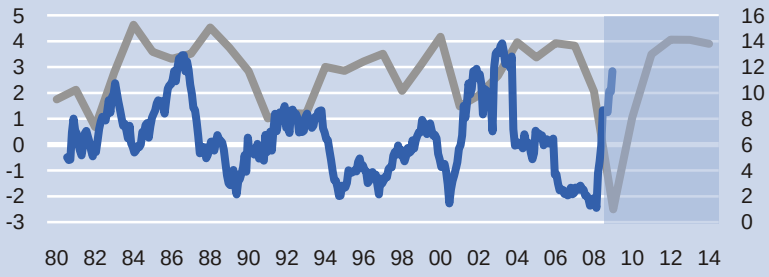
Sources: Federal Reserve, ECB, BoE, BoJ, DB Research 59

Scenario 2: Global excess liquidity is cut back

Shrinking global excess liquidity would require a situation in which the global money stock shrinks or at least grows at a much lower rate than nominal GDP. Nominal GDP growth could either be driven by rising CPI inflation and/or higher real GDP growth. How realistic is such a scenario? Overall, it does not appear to be very likely for the following reasons. Generally, lending and money creation also picks up once the economy recovers/booms. In order to keep credit and money growth in check (i.e. to ensure that it grows less than nominal GDP) major central banks would need to adopt a much more restrictive monetary policy for many years to come, especially in light of possibly falling potential growth rates. However, in view of the current deep recession, the odds for a quick return to restrictive monetary policies seem to be rather low. Also, overly restrictive monetary tightening could quickly weigh on economic growth, dragging nominal GDP growth down and hence limiting the chance of GDP catching up with the money stock.

Another factor that could bring global excess liquidity down is a surge in CPI inflation. Many observes have voiced concerns that the central banks' present policy of 'fighting the consequences of too much money with even more money' will inevitably lead to much higher CPI inflation rates some years from now. However, against the backdrop of low capacity utilisation and rising unemployment, the scope for growing wage claims should remain very limited over the next few years. Moreover, companies will probably find it very difficult in the current environment to raise prices. Therefore, it remains rather unlikely that consumer prices will edge up significantly in the near/medium term. Even if CPI inflation picks up significantly in the longer term, it remains questionable whether this will suffice to cut back global excess liquidity significantly and persistently as central banks would take counteractive measures to keep inflation in check. It is interesting to note that, in the past, CPI inflation rates stayed at relatively low levels in major advanced economies despite strong growth of narrow and broad money in the aftermath of the dotcom crash. A possible explanation for today's still low CPI inflation is stronger competition in product and labour markets. Hence, the positive effects of globalisation are likely to prevent significant price increases of goods and services despite relatively strong money growth.

Accelerating global narrow money growth points to a recovery in world GDP starting in 2010

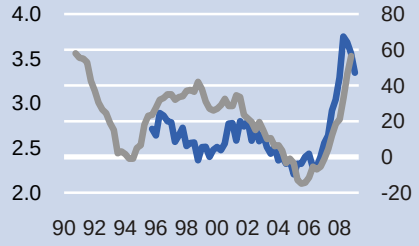


Sources: IHS Global Insight, IMF, DB Research 58

Finally, excess liquidity could be reduced by a long-lasting, broad-based and steep decline in bank lending. Such a balance sheet contraction in the banking sector would require deeply negative

USA: Tightening credit standards on consumer and business loans…

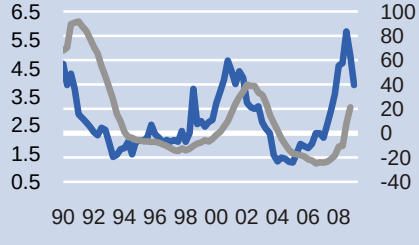
US consumer loans



Sources: IHS Global Insight, Federal Reserve, DB Research 60

… went hand in hand with sharply rising loan delinquency rates

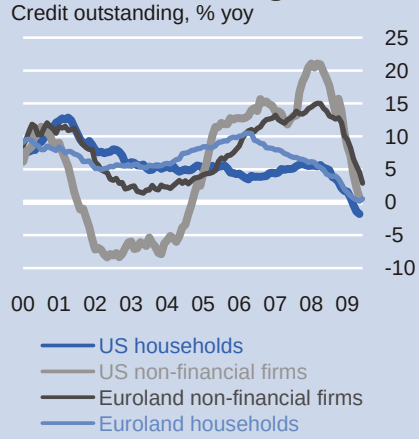
US commercial & industrial loans



Sources: IHS Global Insight, Federal Reserve, DB Research 61

USA/EMU: Credit growth has slowed significantly or even turned negative

Credit outstanding, % yoy



Sources: IHS Global Insight, Federal Reserve, ECB 62

growth of credit for many years. Moreover, the fall in lending would need to be much steeper than the decline in nominal GDP. Such a 1930s or Japan-style scenario would be most painful and severe for the economy. Although the world economy will likely continue to suffer from rising loan and bond defaults, leading economic indicators such as global narrow money growth already point to a recovery from 2010. Doubtless, credit demand and supply have weakened considerably for some months, according to bank lending surveys. However, the pace of the downward momentum has decreased recently. For instance, the net balance of US banks reporting weaker loan demand/supply has shrunk again in April, according to the Fed's latest Senior Loan Officer Opinion Survey on Bank Lending Practices. At the same time the net balance of banks tightening lending standards on loans to large and medium-sized companies decreased significantly to around 40% in Q2 2009 from more than 80% in Q4 2008. In Europe, the degree of tightening has also slowed in the euro zone, while banks in the UK have started to ease corporate loan standards again. Although bank lending standards are still in tightening mode in most major economies and rising loan as well as bond delinquency rates may continue to weigh on lending growth for a while, a long-lasting and broad-based fall in credit still remains rather unlikely thanks to the decisive fiscal and MP easing as well as the vast measures to stabilise the banking sector.[21] Moreover, in light of tentative signs of some economic stabilisation, Moody's global speculative-grade 12-month trailing corporate default rate is now expected to reach its cyclical high at around 12% by the end of this year already, and at a much lower level than initially feared.

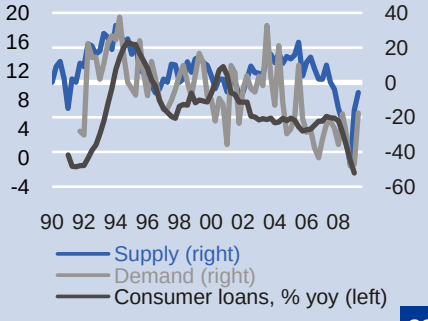
Global excess liquidity stock is likely to remain large …

At present, all three global excess liquidity indicators are undergoing diverse developments. Though the CB balance sheet expansion has not (yet) translated into higher credit and hence into a broadening of money, the money-to-GDP ratio keeps rising thanks to falling nominal GDP and still positive (annual) broad money growth. While broad money has slowed significantly in the eurozone, the UK and Canada, it recently re-accelerated in the US. Even if credit growth has come to a halt for now (or even turned negative in some countries for some segments), it remains unlikely that this will mark the beginning of a long-lasting process of credit destruction. Nevertheless, the stock of excess liquidity (that was created prior to the crisis) has remained large. Concerning global imbalances, financial turmoil has delivered a major shock to highly indebted mainly US and UK households and triggered quick balance sheet re-adjustments in the private sector. For instance, in the US, the personal savings rate has risen from almost zero in the pre-crisis years to now almost 7% of disposable income. As a result of decreasing capital flows into EMs, FX reserves continued to shrink to USD 6.5 tr in Q1 2009, further down from the record level of USD 7 tr reached in Q2 2008. Although the adjustment process in the US household sector has already triggered a partial unwinding of global imbalances, external imbalances are likely to persist at a lower level over the next couple of years. Finally, closing interest rate gaps between major currencies have led to an unwinding of JPY and CHF-funded carry trades. As long as financial market volatility remains high and interest rate differentials between funding and target currencies low, one should not expect a major boost to global

[21] This outlook is basically in line with Schildbach, Jan (2009).

USA: Supply and demand weakening in sync

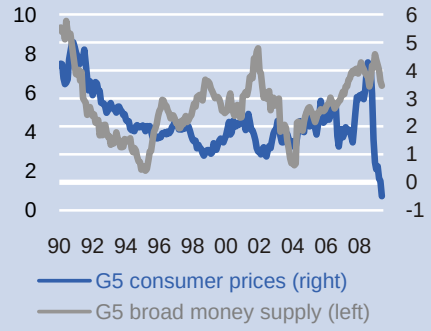
Banks reporting higher supply/demand: net answers, %



Sources: IHS Global Insight, Federal Reserve, DBR 63

Global consumer prices vs. broad money supply

USD GDP-weighted (2000), % yoy



Sources: DB Research, IHS Global Insight, IMF 64

liquidity from carry trades. However, should financial markets and the world economy stabilise again and interest rate gaps widen, then cheap money from Japan may start spilling over again to the rest of the world.

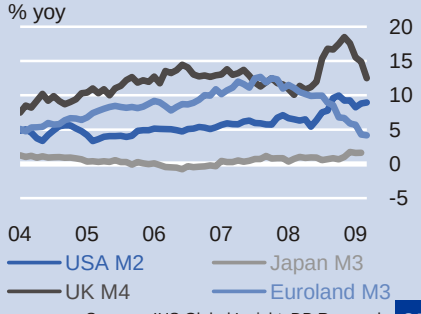
… and could still potentially stoke new asset price bubbles

Having said that abundant liquidity played an important role in the development of the past few years' asset price rally, the big question now is whether the sharp monetary easing by major CBs could lay the ground for a strong re-acceleration of both CPI and asset price inflation over the medium and long term and hence could potentially cause the next asset price bubble, with severe future implications for financial stability. Although the CBs liquidity injections are urgently needed to support the banking system and the overall economy, they involve the risk that credit and money could surge at a later stage to undesired high levels once economic activity and bank lending pick up again. Therefore, central banks need to pull the extra money out of the system when the credit multiplier process normalises eventually and before it starts running hot.

Despite the presence of global excess liquidity near and medium-term risks to global CPI inflation appear to be rather limited at the moment because of the very low levels of capacity utilisation, steeply rising unemployment rates and low wage pressures. In this environment, it seems to be relatively unlikely that CPI inflation will pick up significantly over the next few years. As regards asset prices, it is important to note that the stock of excess money supply remained large and, from a technical point of view, continued to rise primarily due to falling GDP. While narrow excess liquidity has continued to build up significantly because of the recession and accelerating narrow money growth, excess broad money kept growing due to falling nominal GDP and still positive (though weaker) money supply growth. Past experience would suggest that at some point in time global excess liquidity will start pouring into asset markets again. The timing crucially hinges on how fast and firm the next recovery will turn out to be and when investors will become more optimistic and willing to take risks. Therefore, asset prices may receive the next temporary boost from global liquidity once investors start searching for higher yields again. For this reason, central banks may find ways to keep global excess liquidity in check. Indeed CBs are aware of the potential future risks from their extra-liquidity injections and are preparing post-crisis exit strategies from their current expansionary MP stance.

Broad money growth has softened in Europe but re-accelerated in the US

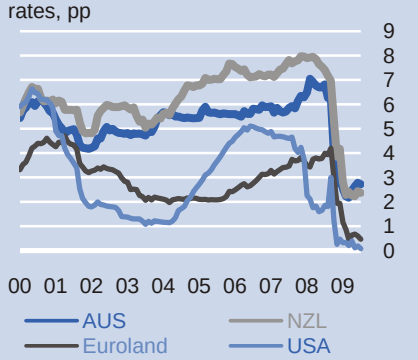
% yoy



Sources: IHS Global Insight, DB Research 65

Interest rate differentials towards Japan fell sharply at the short end ...

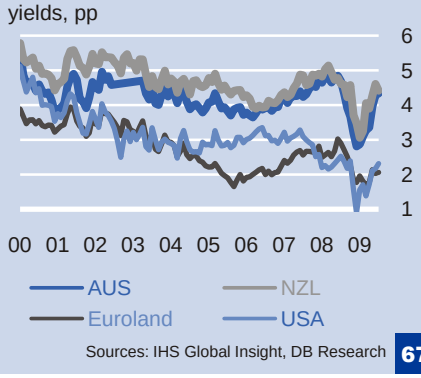
Based on 3-month interbank interest rates, pp



Sources: IHS Global Insight, DB Research 66

... but have widened again at the long end

Based on 10-year government bond yields, pp



Sources: IHS Global Insight, DB Research 67

Conclusion

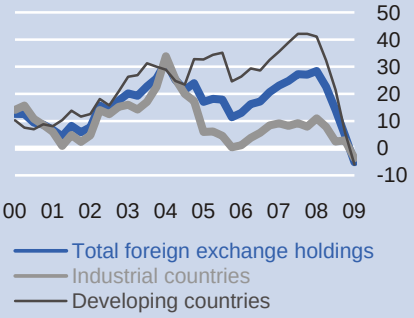
According to our analysis, the world has been awash with liquidity for many years now. In particular, global excess liquidity grew strongly after the bursting of the dotcom bubble. Overall, the past surge in global liquidity was the result of a combination of global factors. (1) Very accommodative MP in advanced economies after the dotcom crash that led to strong credit and money supply growth. (2) Moreover, as a result of fixed or tightly managed exchange-rate regimes, the advanced world's monetary policy stance was implicitly imported into the emerging economies, leading to strong FX reserves accumulation by EMs. (3) Low financial market volatility in the pre-crisis period and chronically large interest-rate differentials fuelled FX carry trade speculation.

As regards asset prices, excess liquidity appeared to be a significant driver behind the previous asset price boom. In particular the current crisis is the result of combining factors: on the one hand, global excess money creation, and the associated search for yield, and, on the other hand, the introduction and rapid distribution of complex securitised products with a lack of due diligence by loan originators as well as inadequate financial regulation by authorities. Since the bursting of the credit bubble, the state of financial markets has changed dramatically. Although major central banks injected massive amounts of extra liquidity, loan growth has softened markedly or even turned negative in some loan segments for some economies. The stuttering credit creation process, gauging by falling money multipliers, largely explains why the sharp acceleration in global base money growth has not (yet) led to a strong acceleration of broad money supply growth. Rather, annual broad money growth softened significantly in Europe, though stayed positive for now.

While the level of FX carry trades was cut back owing to higher risk aversion and closing interest rate gaps, world FX reserves continued to shrink to USD 6.5 tr in Q1 2009, according to the IMF. Although FX carry trades are unlikely to boost global liquidity in the short to medium term, they may start rising once interest rate gaps widen again. In view of the latest data release on China's FX reserves, where the total stock of FX reserves climbed to USD 2.1 tr in Q2 2009, it might well be that world FX reserves have resumed their upward trend. Although the current crisis has already led to a relatively fast, partial unwinding of global imbalances, major institutions such as the IMF do not expect them to disappear but rather to persist at a lower level over the short to medium term.

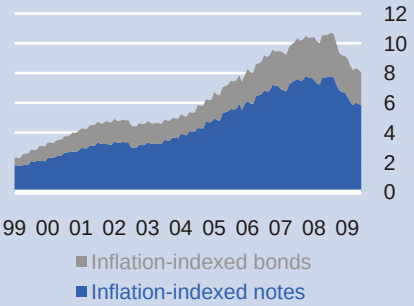
Owing to aggressive MP easing and ballooning CB balance sheets, worries about the formation of another global liquidity glut and its adverse consequences for asset price inflation have become the centre of attention. Many observers are wondering whether the strong stock market rebound since mid-March is already a forerunner of the next recovery or simply driven by a reflux of liquidity into riskier asset markets. Indeed, global excess liquidity (defined as a rising money-to-GDP ratio) keeps growing due to shrinking nominal GDP as well as accelerating narrow money growth and softer, but still positive broad money supply growth, as CBs support the financial system and the economy. However, excess liquidity could still potentially stoke new asset price bubbles. Central banks are aware of this risk and are at the moment preparing post-crisis exit strategies from their current accommodative monetary policy stance. For now the extremely large excess reserves with CBs indicate that this extra money has

World FX accumulation came to a halt in Q4 2008
% yoy



Sources: IHS Global Insight, IMF, DB Research 68

USA: Share of inflation-indexed gov't debt grew over the past decade
% of US marketable public debt



Sources: IHS Global Insight, US Treasury, DBR 69

not (yet) been used to create new credit as intended by central banks. Although CBs have a wide range of possible instruments to drain today's extra liquidity whenever this becomes necessary at a later point, the future will tell whether they will start to act in a timely fashion.

What will the large stock of excess liquidity mean for the future? What is the outlook for CPI as well as asset price inflation? There are several reasons why the current surge in narrow money supply is less of a concern for CPI inflation at the moment. Large output gaps, rising unemployment, little ability of firms to raise prices and a stuttering credit creation process should keep CPI inflation in check over the short to medium term. Moreover, independent central banks (which will make sure that inflation expectations remain anchored), the growing inflation aversion of rapidly aging major advanced economies (with large financial wealth) and the increased importance of inflation-indexed public debt are likely to prevent permanent monetisation of public-sector debt.[22] As regards asset prices, it may only be a matter of time until investors become increasingly unwilling to hold liquidity at the current low level of return, especially when the economic outlook improves significantly. Hence, once investors start to reduce their large liquidity holdings again, asset prices may receive some support from a reflux of money into financial asset markets. However, this time policymakers are unlikely to remain inactive should they suspect the formation of another asset price bubble.

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[22] See Gräf, Bernhard and Stefan Schneider (2009).

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