



Banking Observatory

October 5th, 2009

Liquidity cycle: a torrent no longer

- Aggregate commercial banking liquidity will grow 2009-12 at an average rate 4.7% below its 2003-2007 pre-crisis growth rate
- Liquidity is at its greatest deviation from trend since 1990, but has likely reached a bottom despite a significant shock
- Increased savings by consumers cannot translate into balance sheet repair if commercial banks are not creating liquidity

Chasing liquidity: the role of bank balance sheets

Liquidity as a term is used in a variety of ways. For example, many commonly describe liquidity as the ability to buy assets, goods and services immediately, with cash featuring as the most liquid asset. Less often discussed is the process of liquidity transformation where illiquid assets become liquid liabilities, upon which this brief will focus. The epicenter of liquidity transformation is the bank's balance sheet: banks exist to hold illiquid items on their books and extend liquid liabilities. For example, banks create liquidity when they extend business loans financed through deposits. Alternatively, when banks take illiquid liabilities like equity and invest into liquid assets like treasury securities, liquidity is effectively destroyed.

The shift in the production process between types of sources and uses creates a liquidity cycle on the balance sheet of banks. This is the cousin of the deleveraging cycle, commented on in a previous Banking Observatory (28 May 2009), where banks reduce their assets to equity ratio. Given the size of balance sheet assets, banks determine the rate of liquidity transformation as they consider the sources and uses of liquid and illiquid assets and liabilities. In the end, this production process imparts significant effects on the transmission mechanism of monetary policy, the mobilization of savings, and on output.

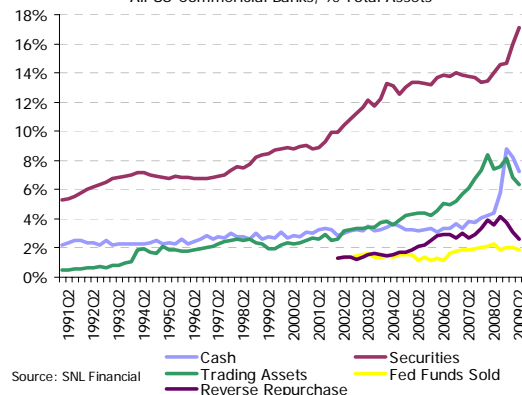
Financial fragility, liquidity and the banking system

In the canonical model of a bank, the banking system's funding was mainly derived from depositors. The banking system worked to translate depositor's funds into long-term investments, with the main risk arising from possible bank runs resulting from all depositors withdrawing at the same time.¹ However, over the years banks have increasingly integrated with the wider financial system. For example, total securities as a percentage of total assets for US commercial banks have increased from 5.3% in 1990Q4 to 17.1% in 2009Q2. Cash as a percentage of total assets has only spiked in response to the recent financial crisis – over the past two decades it maintained a remarkably stable 2-4% share of total assets. Trading assets as a percentage

¹ Diamond DW, Dybvig PH (1983) "Bank runs, deposit insurance, and liquidity" *Journal of Political Economy* 91:3:401-19

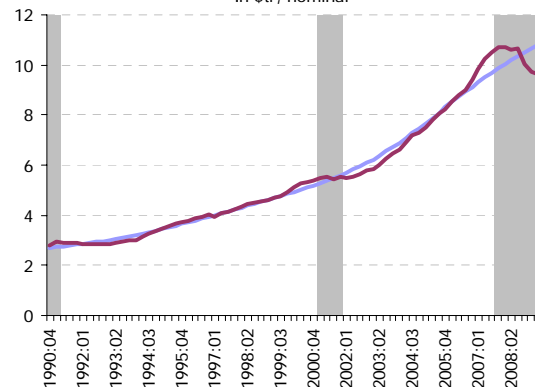
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Liquidity and Balance Sheet Items
All US Commercial Banks, % Total Assets



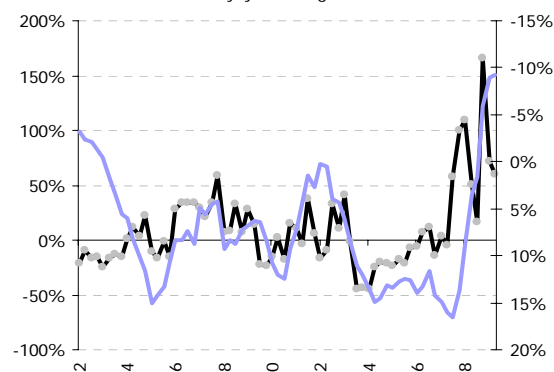
Source: SNL Financial

Commercial Bank Liquidity Creation
In \$tr, nominal



Source: BBVA ERD

Volatility and Commercial Bank Liquidity
yoy % change



Source: BBVA ERD

of total assets similarly steadily climbed higher to 8.42% in 2008Q1 and then dropped as a result of the financial crisis.

Given the extension of commercial banks into the broader financial system, these institutions are increasingly susceptible to financial fragility in the form of "cash-in-the-market-pricing." Cash-in-the-market-pricing works as follows: banks must sell assets to raise funds, but during a crisis, the prices of assets are too low to completely compensate providers of financing. Central banks play a role at this point by providing emergency funds to the system, but the increase in asset volatility will still cause widespread damage.² This is the catalyst for the financial crisis' spillover to the real economy. When banks can no longer transform liquidity effectively, less borrowing is available, asset prices are lowered, and collateral is worth less, creating a downward credit cycle or the fear of "catching a falling knife."³ Decreased liquidity transformation at banks can therefore entail serious effects on the economy.

Measuring liquidity

Following the methodology of Berger and Bouwman (2008), bank balance sheet items are weighted by liquidity, encompassing assets, liabilities plus equity, off-balance sheet guarantees, and off-balance sheet derivatives, according to the scheme in Table 1.⁴ The dataset comprises up-to-date balance sheet items on all US commercial banks. Using this categorization scheme, it is straightforward to determine the extent to which commercial banks are creating liquidity at the aggregate level.

The aggregate series corresponds remarkably well to NBER recession periods. Liquidity creation grew at a faster rate after 2000 than in the previous decade, which corresponds with anecdotal evidence regarding the pace of financial innovation and deregulation. The liquidity measure peaks during the start of the most recent recession. A trend is constructed by passing the aggregate liquidity measure through a Hodrick-Prescott (HP) filter using standard quarterly tuning.

The filtered results suggest that we are now experiencing the largest deviation from trend in the past two decades, which is not surprising given the historic nature of the recent financial crisis. It is interesting to compare the recent period with the early 1990s, during which the savings and loans crisis caused hundreds of bank failures. In the 1990s, liquidity creation slowed, but its deviation from trend is smaller than that of the recent financial crisis. The key difference resides in commercial banks' entry into the broader financial system and also the widespread shutdown of primary dealers, commercial paper issuance, and other securitized markets. The sharp deviation from trend suggests that the economy will be unlikely to return to the implied level of commercial bank liquidity creation based on post-2000 growth.

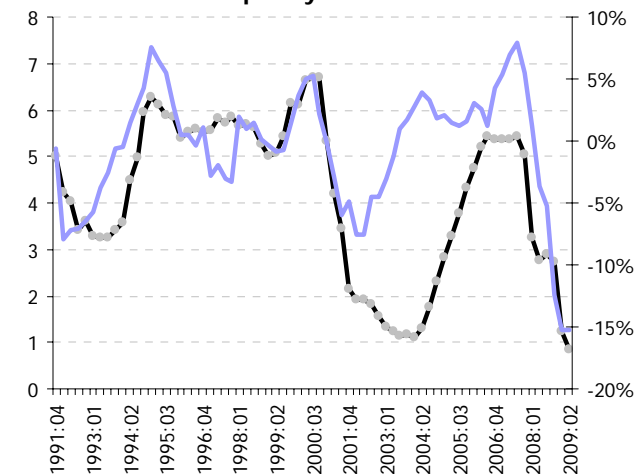
Another instructive view of liquidity is to examine large firms' dynamics for insightful trends. Negative or positive liquidity creation may occur at individual banks in a given quarter, even while the net liquidity moves in a different direction. This idea is captured by gathering roughly 6700 firm-year observations on banks with assets greater than \$10bn. The HP-filtered series is used to consider "abnormal" or above or below trend growth rates of liquidity by individual firms, following Valla et al (2006).⁵ The constructed series maintains a strong survivorship bias: it only includes large banks that

Table 1: Scheme for Constructing Liquidity Transformation

Weight: +0.5		
<i>Illiquid Assets</i>	<i>Liquid Liabilities plus Equity</i>	<i>Illiquid Guarantees</i>
Commercial Real Estate	Transaction Deposits	Unused Commitments
Loans	Savings Deposits	Net Letters of Credit
Farm Loans	Overnight Federal Funds	Commercial Letters of Credit
Commercial and Industrial Loans	Purchased	
Other Loans and Financing	Trading Liabilities	
Other Real Estate Owned		
Unconsolidated Subsidiaries		
Intangible Assets		
Premises		
Other Assets		
Weight: +0.0		
<i>Semi-Liquid Assets</i>	<i>Semi-Liquid Liabilities plus Equity</i>	<i>Semi-Liquid Guarantees</i>
Residential Loans	Time Deposits	Net Credit Derivatives
Consumer Loans	Other Borrowed Money	Net Securities Lent
Loans to Depositories		
Loans to State and Local Gov't		
Loans to Foreign Gov't		
Weight: -0.5		
<i>Liquid Assets</i>	<i>Illiquid Liabilities plus equity</i>	<i>Liquid Guarantees</i>
Cash Due From Other	Subordinated debt	Net participations acquired
Institutions	Other liabilities	
All Securities	Equity	
Trading Assets		
Fed Funds Sold		

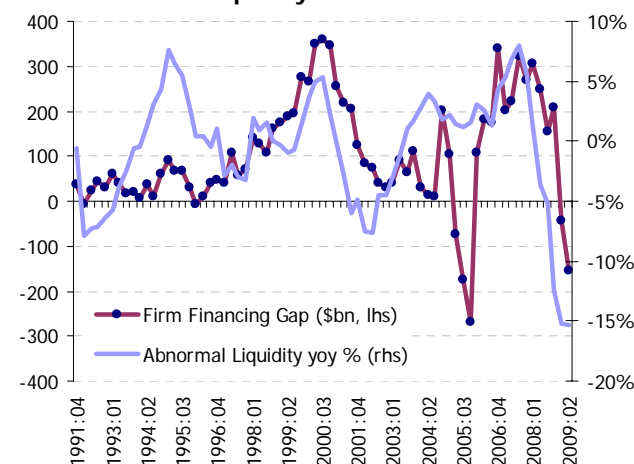
Source: Berger and Bouwman (2008)

Interbank Conditions and Abnormal Liquidity Creation



Source: BBVA ERD — LIBOR (lhs) — Abnormal Liquidity yoy % (rhs)

Firm Financing Gap and Abnormal Liquidity Creation



Source: BBVA ERD and Federal Reserve

² Allen, F, Carletti, E, (2008) "The Role of Liquidity in Financial Crises," *University of Pennsylvania Working Paper*

³ Kyotaki, N, Moore, J, (1997) "Credit Cycles," *Journal of Political Economy*, 99:220-264, Fostel, A, Geanakoplos, J, (2008) "Leverage Cycles and the Anxious Economy," *American Economic Review*, 98:4:1211-1244

⁴ Berger, A, Bouwman, C, (2008) "Bank Liquidity Creation," *Review of Financial Studies*, forthcoming

⁵ Valla, N, Saes-Escorbiac, B, Tiesset, M, (2006) "Bank liquidity and financial stability," *Banque de France Financial Stability Review No. 9*

exist today and their performance over the past two decades. However, if we examine large banks' abnormal liquidity growth over the past 10 years, we can limit the effect of mergers and survivorship bias somewhat. The dataset suggests that large firms are veritable factories of liquidity, representing about 73.1% of all liquidity creation in 2009Q2. The yoy growth rate of negative liquidity flows is more volatile than the yoy growth rate of positive liquidity flows, which generally follows the aggregate liquidity growth rate.

This feature of the data suggests that large firms play a special role in the creation of liquidity. Some policymakers have recently suggested that "too big to fail" institutions may interrupt the optimal functioning of monetary policy. It is argued that the concentrated risk exposure and subsequent balance sheet effects of a sudden credit crunch on large banks has caused policymakers to resort to unorthodox measures to restart economic growth as traditional interest rate-cutting floundered. However, from the standpoint of aggregate liquidity, large firms may offer economies of scale in the production of liquidity. These institutions may be disrupting monetary policy, but they also represent the pipeline of the vast amount of liquidity in the financial system. Forecasting dynamics in aggregate liquidity, therefore, is essential to understanding details of this process.

Liquidity forecasting: how much and when?

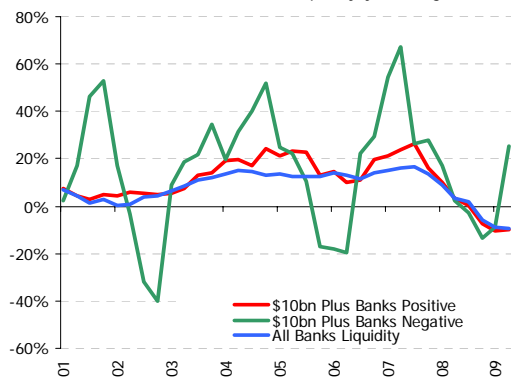
In order to forecast aggregate liquidity, a conditional VAR model is defined using commercial bank liquidity, GDP, the Federal Reserve funds rate, the VIX volatility index, and the TED spread (the difference between 3-month US Treasury bill rates and LIBOR). The Federal Reserve funds rate variable is conditioned to follow the BBVA baseline scenario. VIX, GDP and aggregate liquidity are expressed in logs, while the Federal Reserve funds rate and TED spread are rates. Lag length selection was based on the AIC criterion. The decomposition of variance for the model suggested consistent and reasonable explanatory power of the chosen variables. Theil's U was also calculated to evaluate the performance of the forecast. Alternative models would possibly involve restrictions within an SVAR framework or an investigation of cointegrating properties via a VECM.

The results of the model suggest that the financial crisis created a notable shift downwards in the level of aggregate liquidity. The growth rate post crisis, after recovering from the shock of the credit crunch itself, is expected to grow at an average rate below that of 2003-2007 and marginally lower than that of 1994-2002. The exercise also implies that the level of aggregate liquidity has reached a bottom. This is concurrent with recent comments by the Federal Reserve that the economy will soon emerge from recession and that the current recession has lasted for numerous quarters.

Bottom line

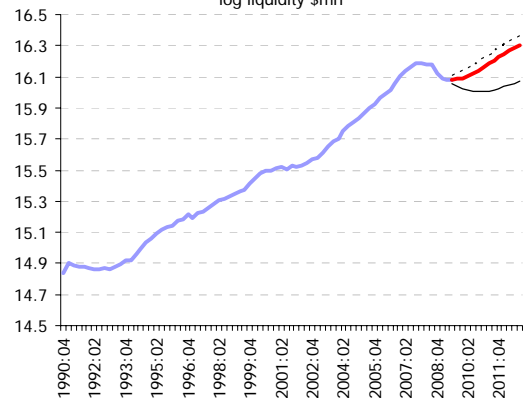
Starting from the standpoint of the sources and uses of balance sheet items, commercial banks create maximum liquidity by matching illiquid assets and liquid liabilities. The growth of liquidity over the years has evolved with the increasing involvement of the commercial banking system in the wider financial system. This process caused trend liquidity creation to pivot upwards in recent years, with significant abnormal aggregate liquidity growth starting in early 2006. Our results indicate that liquidity has reached a bottom, but will not return to its pre-crisis growth rate and will likely grow at a rate more similar to that of 1994-2002. Commercial banks' liquidity creation affects the availability of credit in the economy and balance sheets of firms, both areas of which disrupt real output. Savings mobilization in a time of crisis – where savings edge upward due to precaution – cannot effectively transform into balance sheet repair if banks' liquidity creation is contracting. In addition to these issues, constraining legislation from government also implies that trend liquidity growth will not return to pre-crisis patterns.

Positive and Negative Liquidity Flows
Commercial banks \$10bn plus, yoy % change



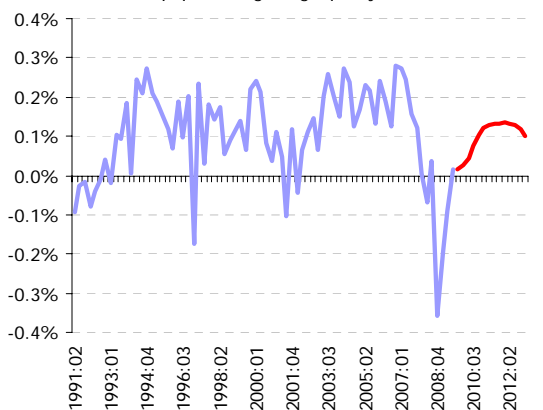
Source: BBVA ERD and SNL Financial

Commercial Banking Liquidity Forecast
log liquidity \$mn



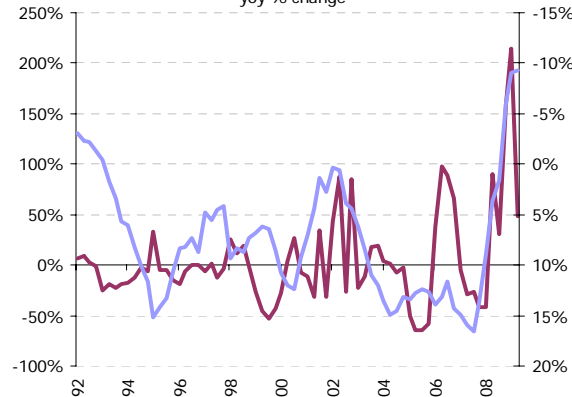
Source: BBVA ERD — Actual — Forecast — Upper — Lower

Commercial Banking Liquidity Forecast
qoq % change, log liquidity \$mn



Source: BBVA ERD — Actual — Forecast

Savings and Liquidity Creation
yoy % change



Source: BBVA ERD — Savings Rate (lhs) — Liquidity (reverse scale, rhs)