Credit Monitoring in the USA and EU Countries

Kadish, Peter

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Abstract

In order to analyze current state of events in the world economy, parallel analysis with the country that has gone through boom cycle in real estate and financial asset prices (as US did during the last decade) and sudden consequential bust in mid 70s and late 80s (USA 2007), namely Japan, is performed. The definition and role of money in the economy in its various forms from narrow to the most broad credit aggregates and interrelations between central bank policy and growth of credit is discussed.

JEL Classification: E40, E50, E51, E52.

Keywords: Credit, Monetary Policy, Monetary Aggregates, Money Supply, Deflation

Japanese example in the 70s – the problem solved

Due to abandonment of fixed exchange rate system in 1971, dollar has depreciated against all major currencies (since it has been overvalued in fixed exchange regime and no depreciation was possible). Bank of Japan (BoJ) and Ministry of Finance of Japan (MoF)[1] were concerned with slower export growth and to support the economy expanded credit significantly. By 1973, it became clear that excess credit creation was being used merely for speculative land and asset transactions, thus pushing up asset prices. Urban land prices jumped by more than 50% from 1972 to 1974[2]. It was BoJ that acted as the catalyst for a turn in the business cycle through its key policy tool, window guidance[3]. From 1973 it imposed tight window guidance loan growth ceilings. The tight control lasted two full years, until early 1975. Bad debts began to pile up in the banking system. As the banks became paralyzed by the bad debt, they reduced lending. The necessary and sufficient condition for economic recovery had been an increase in the credit growth. In the late 1975 and early 1976 the BoJ had raised its window guidance loan growth ceilings. In sum, only new credit via window guidance (forced credit) was able to turn the economy.

Japanese experience in late 80s – the problem not solved.

For reasons beyond the scope of this paper from about 1986 onwards, banks increased credit creation aggressively. Meanwhile, the ability of the economy to service these loans – national income – only grew about half as fast. It was classic case of unproductive excess credit creation: money was produced by the banking system but not used productively. Instead, it was used for speculation or consumption. Bank loans can be called the borrowing of the nation. The ability to service loans depends on income generation. That is GDP growth. The visible problem was the in the late 1980s, Japanese bank loans grew double digits, while nominal GDP rose by no more than 6%. In 1989, banks suddenly restricted loan growth. During the course of 90s, BoJ did not create credit in the economy, intensifying deflation pressure[4]. BoJ engaged in quantitative easing (QE) in 2001. Success of these operations has been limited.

Understanding credit and its role in economic growth

Central bank does not target amount of credit (money) in the economy, it targets short term interest rate (bank reserves) to run monetary policy today[5]. By having too much excess reserves (which central bank can create via open market operations), banks can expand credit (deposits) in the economy and make profit on the difference between cost of liabilities and

[1] Before 1998, responsible for monetary policy conduct in Japan.
[2] Werner (2003)
[3] BoJ controlled the amount of credit that the economy would recieve.
[4] The reason as in Werner (2003) is that BoJ wanted structural change in the economy and simply granting credit would have not achieved this. Therefore, no credit was granted.
[5] Many countries that introduced monetary targeting failed. The Bank of England went through a number of monetary targets without success. It finally abolished the procedure entirely in the mid-1980s. The bank of Japan was more successful, it met monetary targets with the utmost precision. By precisely controlling credit creation through its window guidance it could also achieve any targeted goal for deposit measures, such as M2+CD. Fed and Bank of England did not have window guidance. The reason for abandoning targets for money growth and instead setting interest rates as a way of making monetary policy comes from 1970s when prior stable relationship between money growth and either inflation or nominal income growth no longer existed (more in Friedman, Kutter (2010)).

return on assets. Differently put, commercial banks are important vehicle in credit creation[6]. However, the ability of banks to create credit does not necessarily mean that credit will be created.

Credit can be either used for transactions that are within GDP accounting and within non-GDP accounting, such as all asset (real estate) and financial transactions. Thus during the last several decades we have observed increased amount of credit that has been used in financial and real estate transactions and therefore traditional quantity equation has recorded a decline in velocity (say M2, M3 velocity) since raising part of the money supply was used for non-GDP transactions.

Chart 1. Money Velocity, M3

Federal reserve does not publish M3 since 2006.

Source: Bloomberg

In sum, the accurate representation of money supply in a large non-cash based economy is credit creation[7]. It is important to distinguish between productive credit creation, which is used for the creation of new goods and services, and which is non-inflationary, and unproductive credit creation, which leads to one of two types of inflation. Unproductive credit creation can take the form of "consumptive credit", which is the extension of credit for the consumption (but not creation) of goods and services – consumer price inflation (which hasn't been observed due to emerging markets and China integration in the world economy with vast productive capacity and labor force). Unproductive credit creation can also take the form of non-GDP credit, which is credit created for the use in asset or financial transactions (observed in the USA, elsewhere). Excessive (>GDP growth rates) unproductive credit creation is unsustainable in the medium to long run[8]. When banks are exposed to unproductive credit, they are exposed to asset price fluctuations. Consequently, if prices fall (when borrowing (credit) raises quicker than income (GNDI which is equal to GDP) is growing, at one stage the

[6] An accurate representation of credit creation is given in (Werner (2009))

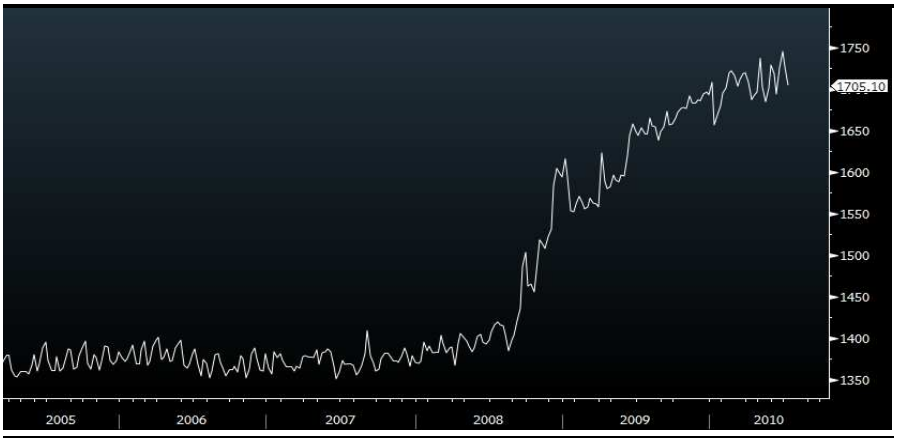
[7] Via regression analysis, credit to productive part of GDP has been proved to be the most efficient in explaining the long turn performance. Other variable such as interest rates, M0, M2 monetary aggregates are insignificant at conventional level of alpha. Bank credit appears to be in a stable long-term relationship with nominal GDP growth.

[8] The problem with contemporary monetary policy is that credit creation vehicle is given to commercial banks. Being private entities, they aim at raise in profitability and do not consider social wellbeing when conducting regular business. Short-termism is associated with raise in leverage and boom-bust cycles.

borrower will not be able to pay back/refinance all those loans) and as bank assets shrink, they can no longer expand credit to productive sector (and neither to unproductive) – this is Fisher's debt deflation theory.

What Japan did in 70s via window guidance is it literally forced banks to lend, and since external demand existed (Japan was major exporter to EOCD[9]), recovery followed. Central banks today do not target amount of credit. Central banks target short term interest rates and bank reserves. Bank reserves, being part of high powered money today have skyrocketed (Chart 2).

Chart 2. M1 Money Aggregate



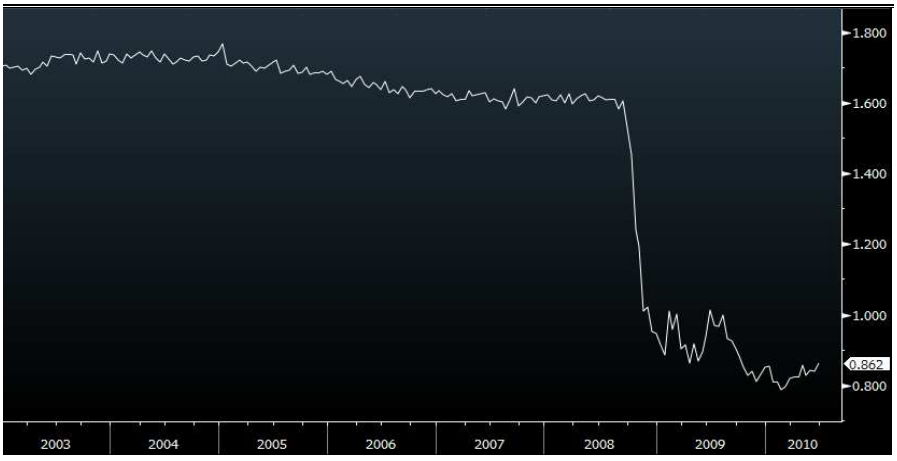
Source: Bloomberg

This gives banks an ability (but does not obligate) to increase credit in the economy. Banks prefer to recycle these reserves back to the Fed (excess reserves) or purchase government bonds. Banks do not create credit in the economy. At every level of interest rate there is demand for credit and as interest rate approaches 0, demand for credit raises. It is up to the bank to make the decision on whether to grant credit or not. When bank assets are impaired (from credit to unproductive economy), credit supplied for productive use is constrained.

The monetarist prescription to increase high-powered money (and their subset, bank reserves) has so far failed. It has failed in Japan in the 1990s, 2001 to boost the economy. As long as banks are burdened with asset prices significantly below par (or deflated, unmarketable, level 3 assets without market valuation), they will not want to increase credit and money multiplier will not work.

[9] Werner (2003)

Chart 3. Money Multiplier



Source: Bloomberg

The Kaynesian and post-Keynesian prescription of fiscal expansion has failed to boost Japanese economy - Werner (2004) showed that when government spending is financed not by monetization (thus increasing money supply, credit) but by bond issue, no new purchasing power is created but money is redistributed from private sector to the government, leaving GDP unchanged (in Y=C+I+G+NX). From regression analysis, Werner (2004) showed that for every yen in government spending that is not monetized, private demand shrinks by 0.957 yen (approx 1 yen)[10]. Borrowing from abroad will not necessarily diminish purchasing power in the economy (if central bank does not sterilize increase in money supply). However, FX borrowing ceiling should be lower than local currency ceiling since foreign currency cannot be printed.

Interest rate channel does not work when interest rates approach 0 (fed funds at 0-0.25%, liquidity trap). Since BoJ bought only high quality paper and disregarded problematic assets, attempt to boost credit has been ineffective. QE in the US is more efficient since the Fed took on its balance sheet not only US sovereign obligations, but also unmarketable MBS. Nonetheless, the amount of expansion in credit and the amount that the Fed can take on the balance sheet is not comparable (shadow banking system liabilities of about USD 20 Trill. at high in 2007). If the Fed had taken all impaired assets on the balance sheet and paid for them at par, dollar sustainability would be questioned. Therefore even correct in its approach, the magnitude of the problem is too great to be solved via such a swap operations (cash of bad assets on bank's balance sheet). Monetization procedures of such a magnitude can lead to severe negative consequences for dollar's reserve status which plays major role in USA economic growth (borrow cheap from the world and lend with a margin strategy).

As highlighted above, BoJ has engaged in window guidance in 1970s. This is not an option for the Fed today, as it has no legal power to obey banks to lend. What is there in the arsenal to fight deflationary pressure?

[10] Kumar and Woo (2010) showed that based on a range of econometric techniques, there is an inverse relationship between initial public debt and subsequent growth, controlling for other determinants of growth: on average, a 10 percentage point increase in the initial debt-to-GDP ratio is associated with a slowdown in annual real per capita GDP growth of around 0.2 percentage points per year, with the impact being smaller (around 0.15) in advanced economies.

1. Productive demand for credit comes from economic prosperity or technological progress or when the economy moves upper on the value added chain. If there is an ability to improve efficiency, then demand from companies would raise demand for credit, and since used productively, would not result in bank inflation. This theoretical picture does not in any case suggest what monetary authorities should do as there still has to be source of demand for this value added production. Demand is what is needed for the recovery. Demand in previous years came from the fact that with appreciating real estate and (of lesser importance) stock markets – which has been based on deregulation and consequent credit creation, consumers were able to withdraw equity from these assets and spend it. Differently put, demand was driven from appreciating assets. In order to remain on the same path of growth, not only it is necessary to get values of assets to previous highs, but also to keep the same slope of growth. How likely is that in the current state of event? Not very likely. At first, the Fed would have to make up for the gap between market price of impaired assets and the par value. This is not consistent with its objective to keep inflation low. As discussed, intervention of such an immense size increases probability of dumping the dollar as reserve currency (and therefore raising inflation). For these reasons, validity of conclusions from analysis of projections for consequent credit growth based on statistical analysis of data between 1970 – 2007 should be questioned[11].

2. Demand from emerging markets (China, India, etc…) – as shown in Kadish (2010)[12], there is no private demand in these countries due to financial underdevelopment and economic structure. Consumers are not able to withdraw equity from appreciating assets (if assets are appreciating) and spend it (not even saying that there is no desire to spend). It seems that claim of change in the paradigm and superiority of new emerging market consumer is simply not supported by any plausible argument, empirical research or statistical analysis[13].

Major credit indicators

Credit in the broad term is what matters for asset prices. Asset prices and development of financial system is what mattered for growth during the last decade. Even though we follow bank assets as the quickest way to proxy credit creation (banks publish quarterly reports quicker than FFA[14]), liability analysis (from FFA) of traditional and shadow banking system gives most comprehensive analysis of interrelations between asset prices (from accounting point of view, they are the same). Chart 4 shows that even thought bank assets continued to raise after NASDAQ bust, stock markets remained flat to negative for the next several years. Since bank assets created credit in the economy, eventually stock markets turned and followed the credit creation trend.

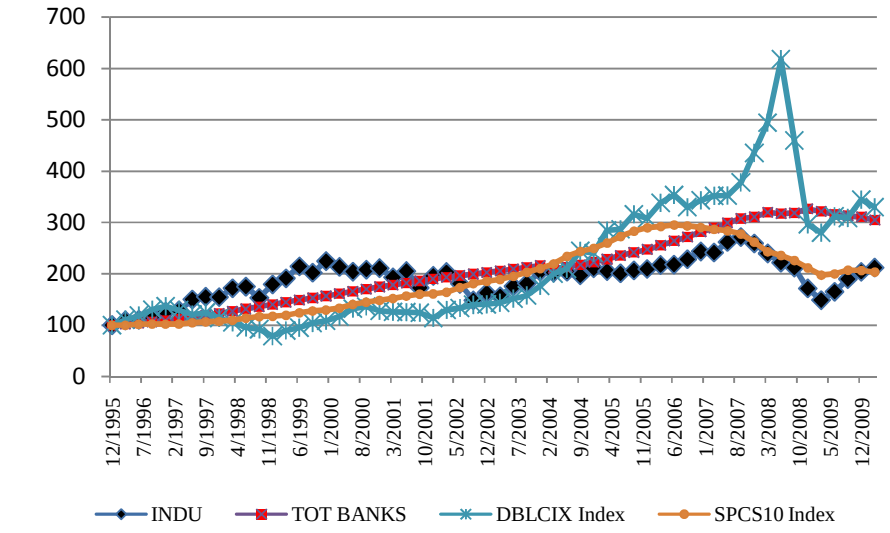
[11] According to IMF, lending conditions with bank lending surveys used as a proxy lead credit growth by about 4 quarters (IMF Global Financial Stability Report, 2010 April). This conclusion is based on statistical analysis of the period 1970 – 2001. If we assume that there is structural change in fundamentals (if we enter phase of deleveraging), this analysis is invalid by its approach.

[12] http://ssrn.com/abstract=1652884

[13] The only demand that can come is from government G in Y=C+I+G+NX. But government demand, if not monetized, soaks money from the private sector (crowds it out) producing no intermediate growth.

[14] Flow of Funds Accounts at the Federal Reserve.

Chart 4. Price Performance of Various Assets, USA

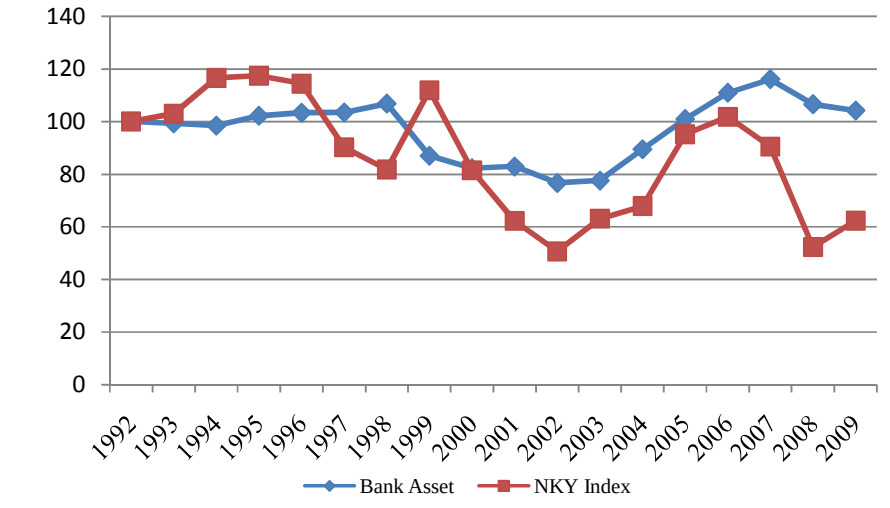


INDU – Dow Jones Index; Tot Banks - sum of commercial banks' liabilities and shadow banks' liabilities; DBLCIX – DB commodity Index; SPXS10 - Case-Shiller Home Price Index

Source: US Flow of Funds Accounts, Federal Reserve, Bloomberg

Chart 5 shows the relationship between bank assets (or credit proxy in the economy) and NIKKEI index.

Chart 5. Correlation between Credit and Stock Market



Bank Asset – Bank assets of selected banks from Bloomberg database. NKY – NIKKEI Index.

Source: Bloomberg

The ultimate question is: is there a reflexive relationship between bank credit and stock market valuation which reflect expectations of future earnings. Intuition suggests that this is not stable relationship and hardly subject to any "written rule". Expectations might push prices up which might reinforce confidence in further growth and result in self reinforcing expansionary process. However, if expectations are not supported by fundamentals, eventually reverse self-reinforcing process will be engaged. Consistency between expectations (stock market) and actual credit creation (bank assets) is what inevitably experiences stable relationship in the long run. Appendix I discusses credit monitoring approach in the economy.

Conclusion

Excessive (>nominal GDP growth) unproductive credit creation (as in Japan in 70s, 80s) leads to subsequent crisis and deleveraging periods. Japan has forced banks to lend in the 70s. Since credit was used productively, this has resulted in economic recovery (Japan was major exporter to OECD[15]). In 90s, window guidance has been cancelled and banks being burdened with bad assets stopped lending. As credit constraint seems to be primary source of problem for productive economy, deflation followed. Neither Fed, nor ECB can force banks to lend. In order to achieve this task, large quantity of unmarketable assets have to be removed from commercial banks' balance sheets to the central bank balance sheet – this can result in abandonment of USD, EUR as reserve currencies. Government support is constrained for 2 reasons: Japan experience shows that local borrowing, if not monetized, simply redistributes demand from private sector to public, not affecting GDP in the long run. Borrowing in foreign currency is constrained by definition as foreign currency cannot be printed. It is subject to roll-over risk and sudden hike in the cost of borrowing. The most important economic statistics to follow is credit creation in the economy via various proxies. Without credit, recovery is not possible by definition due to tight relationship between credit and nominal GDP growth. The quickest proxy that indicates whether credit is growing is bank asset quarterly reporting (aggregate for large number of banks). Results for Q2 do not indicate any improvement neither for the US, nor for Europe. Consequently, the best assets to have during the period of deflation are: long long term treasury bonds, short precious metals.

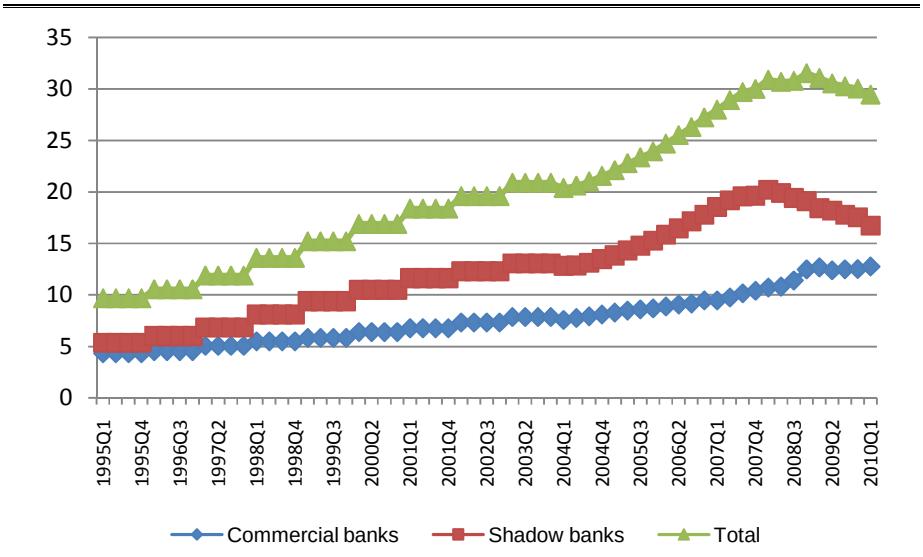
In Appendix II we show that analysis of M2 as a proxy for credit in the economy is meaningless both for developed countries (with securitization market) and emerging economies (where credit is taken in foreign currency from banks that are effectively foreign banks' subsidiaries. M3 for Europe is somewhat more meaningful than M3 in the USA due to lower level of securitization market development. We speculate that in any case, analysis of Bank Assets (commercial and shadow where existent) is the quickest way of analysis of credit developments in the economy.

[15] Werner (2003)

Appendix I

1. Major data for analysis (Flow of Funds Accounts, IMF domestic credit, etc…) is being reported with significant lag. Bloomberg database which is constructed from quarterly reports published by the banks is the quickest proxy for credit in the economy. Very few companies in the EU have reported their 2010 Q2 figures. Based on 2010 Q1 figures bank assets are either contracting or flat in Europe. Around 45% of selected sample of US banks have reported their 2010 Q2 figures. Based on 2010 Q2 estimates, bank assets are contracting in the USA.
2. M2 is not a good proxy for measuring credit change in US economy, therefore it is disregarded from analysis – discussed below.
3. Bank liabilities (traditional banks as well as shadow banking system) for the US is a good proxy for estimating growth. Since 1995, change in the stock of credit has explained about half of GDP movements[16]. Differently put, significant part of economic growth (GDP) has been driven by banks' credit increase. Q2 data for the Flow of Funds Accounts is not yet available. Based on 2010 Q1 data, shadow banks' liabilities are severely contracting while commercial banks' liabilities are neither contracting nor growing.
4. IMF data is only available for 2010 Q1. Credit proxy from IMF is neither contracting nor growing for both US, Europe.
5. Debt aggregates point to overall start of deleveraging process in the USA as of Q1 2010

Chart 1. US Bank Liabilities, Trill. USD.

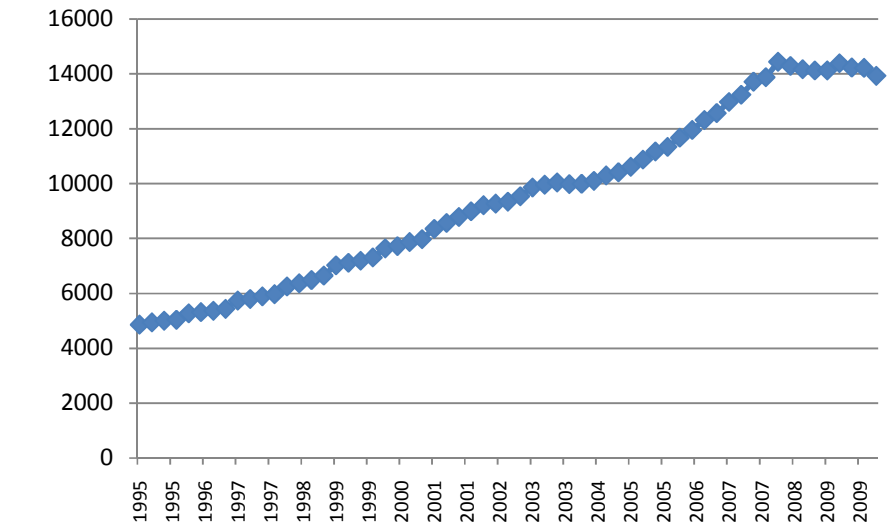


Traditional bank liabilities refer to total liabilities of the commercial banking sector (line 19 of Table L 109 in Flow of Funds Accounts). Shadow bank liabilities (netted from overlaps with Table L 109) refer to the sum of total outstanding open market paper (line 1 of Table L 208), total repo liabilities (line 1 of Table L 207), net securities loaned (line 20 of Table L 130), total GSE liabilities and pool securities (lines 21 and 6 of Tables L 124 and L 125, respectively), total liabilities of ABS issuers (line 11 of Table L 126), and total shares outstanding of money market mutual funds (line 13 of Table L 121).

Source: US Flow of Funds Accounts, Federal Reserve.

[16] Appendix II

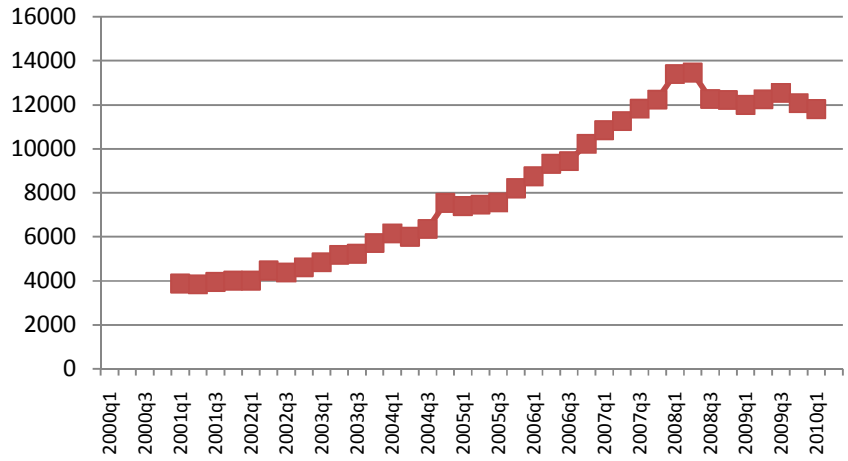
Chart 2. US M3 Aggregate, Bil. USD



M3 monetary aggregate is reconstructed artificially. Federal Reserve does not publish M3 aggregate any more. M3 is reconstructed in the following way: the non-M2 components of M3 include institutional money funds (Bloomberg), large time deposits (Table L5 (line 9)) from Flow of Funds Accounts as well as total finance federal funds transactions and loans made under security repurchase agree liability (Table L 207 (line 1))

Source: US Flow of Funds Accounts, Federal Reserve, Bloomberg

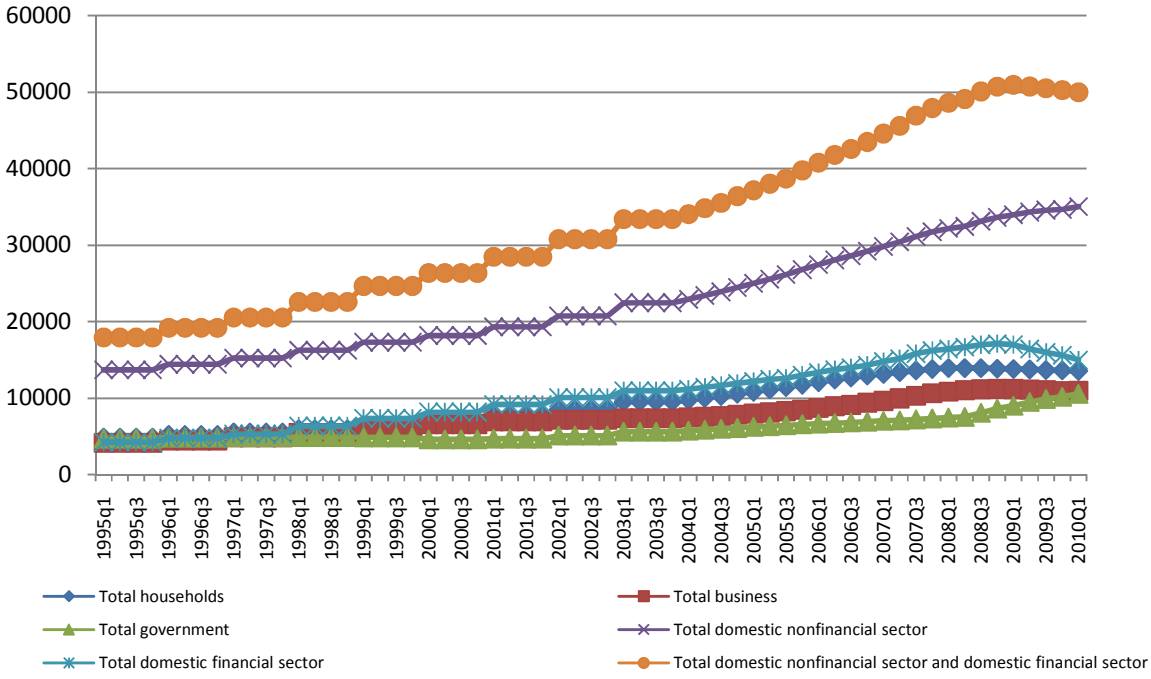
Chart 3. US Banks' Total Assets, Bil. USD



The total of all short and long-term assets as reported on the balance sheet (BS_TOT_ASSET in Bloomberg). Largest 326 banks are being analyzed.

Source: Bloomberg

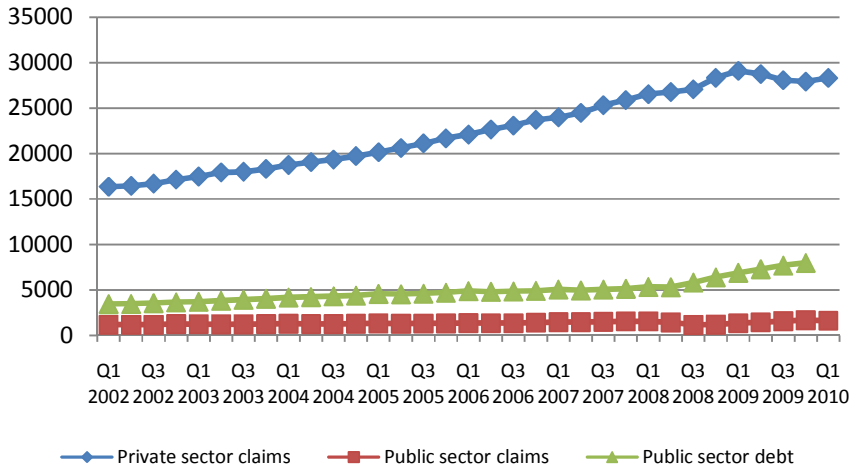
Chart 4. Various US Debt Indicators, Bil. USD, USA



Total households - includes home mortgage debt, consumer credit (D3 table in Flow of Funds Accounts). Total business - includes corporate debt outstanding (D3 table in Flow of Funds Accounts). Total government - includes state and local governments as well as federal government debt (D3 table in Flow of Funds Accounts). Total domestic nonfinancial sector - sum of total household debt, total business debt and total government debt. Total domestic financial sector - D3 table in Flow of Funds Accounts. Total domestic nonfinancial sector and domestic financial sector - sum of total domestic nonfinancial sector and total domestic financial sector.

Source: US Flow of Funds Accounts, Federal Reserve

Chart 5. IMF Private and Public Sector Claims, Bil. USD, USA

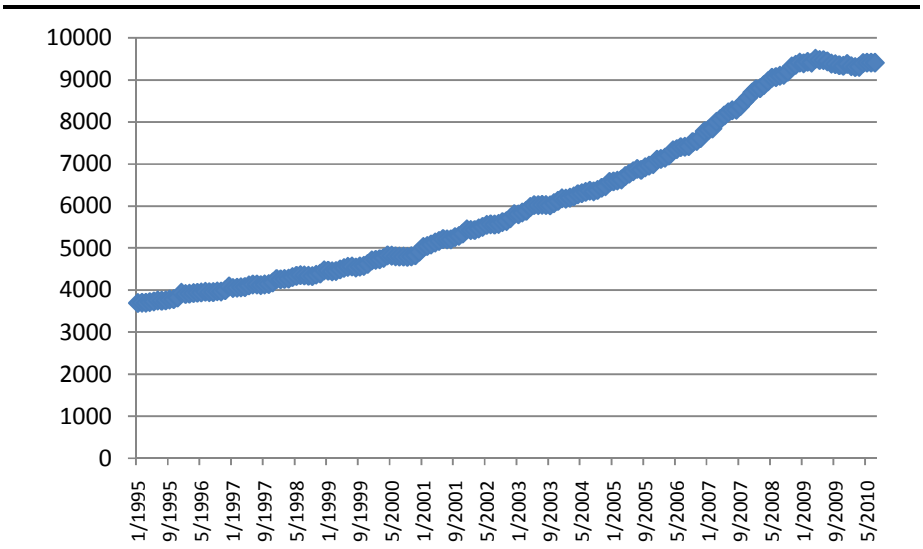


Private/public sector claims are obtained for IMF International Financial Statistics. Taken from section 30 - data for the central bank and other depositary corporations that is consolidated into Depositary Corporations Survey.

Source: IMF

US M2 aggregate, as presented below, turns out to be a bad proxy for monitoring credit developments in the economy - chart not presented.

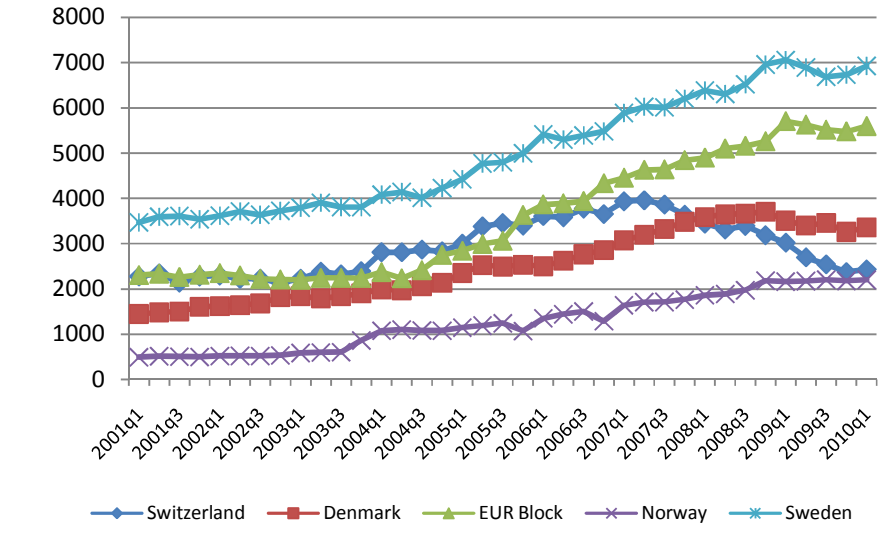
Chart 6. EU M3 Aggregate, Bil. EUR



M2 + repurchase agreements + money market funds and papers + debt securities issued up to 2 years

Source: ECB

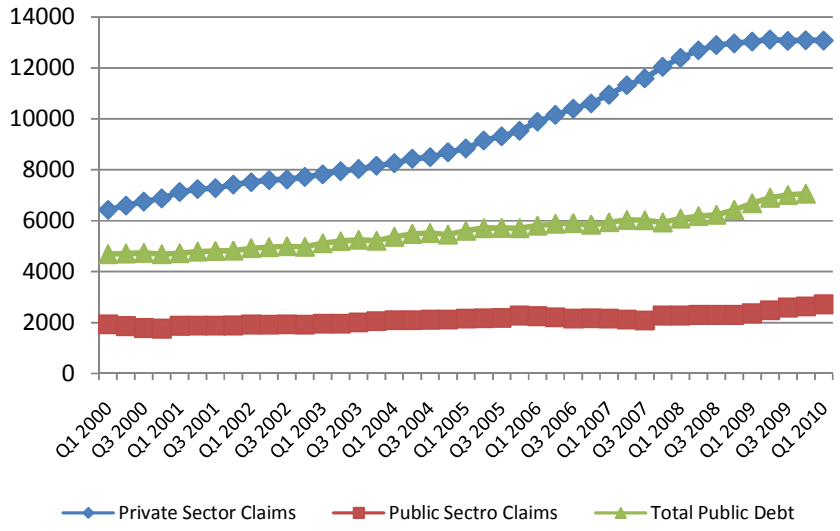
Chart 7. EU Banks' Total Assets, local currency, Bil.



The total of all short and long-term assets as reported on the balance sheet (BS_TOT_ASSET in Bloomberg). Sample consists of 38 institutions in the EU.

Source: Bloomberg

Chart 8. IMF Private and Public Sector Claims, Bil. EUR, EU



Private/public sector claims are obtained fro IMF International Financial Statistics. Taken from section 30 - data for the central bank and other depositary corporations that is consolidated into Depositary Corporations Survey.

Source: IMF

Appendix II

GDP is a flow concept, monetary aggregate is a stock concept, therefore nominal GDP data is regressed on change in the monetary aggregates as well as change in commercial bank liabilities and shadow bank liabilities. As can be seen in Table 1, M2 coefficient is insignificant; however all the rest coefficients are statistically significant.

Table 1.

Dependent Variable: GDP
Method: Least Squares
Included observations: quarterly/annual observations since 1995 [17], USA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2		6.217665	1.749894	0.1107
M3		1.497059	2.970404	**0.0140**
M3 R-squared	**0.468744**			
COMM		2.188365	3.100076	**0.0112**
COMM R-squared	**0.490068**			
SHADOW		0.843337	2.398460	**0.0374**
SHADOW R-squared	**0.365184**			
TOTBANKS		0.621558	2.825636	**0.0180**
TOTBANKS R-squared	**0.443957**			

Traditional bank liabilities (COMM) refer to total liabilities of the commercial banking sector (line 19 of Table L 109 in Flow of Funds Accounts). Shadow bank liabilities (SHADOW, netted from overlaps with Table L 109) refer to the sum of total outstanding open market paper (line 1 of Table L 208), total repo liabilities (line 1 of Table L 207), net securities loaned (line 20 of Table L 130), total GSE liabilities and pool securities (lines 21 and 6 of Tables L 124 and L 125, respectively), total liabilities of ABS issuers (line 11 of Table L 126), and total shares outstanding of money market mutual funds (line 13 of Table L 121). Source: Federal Reserve, Author's regressions

R squared suggests that change in the stock of credit explains about half of GDP.

Even thought M2 monetary aggregate for the USA remained flat (data not presented), it gives no valuable information on economy growth whatsoever. Since securitization market has evolved significantly, this aggregate is simply too narrow to represent the overall economy. Shadow and commercial bank liabilities are better proxies for state of the economy. As evident form regression results in Table 2, total bank liabilities (commercial +shadow, i.e. *BANK*) is a better proxy for the US to track credit developments in the economy than M3 monetary aggregate. Dow Jones Industrial Index is not significantly related to credit developments during the sample period. Stock markets seem to experience long term deviations from credit

[17] 1995 is a point of structural change in economy fundamentals, i.e. deregulation in mortgage market as well as beginning of stock bull market, (see http://ssrn.com/abstract=1652884)

developments in the economy. Housing is strongly related to credit developments (credit leads housing price growth, regression results not presented here).

Table 2.

Method: Least Squares
Included observations: 57, quarterly,1996-2010, USA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: $BANK_{t-1}$				
GDP_t		8.87E-07	-3.611488	**0.0007**
$HOUSE_t$		0.062732	-1.681984	**0.0985**
R-squared	0.197618			
Dependent Variable: $BANK_{t-1}$				
GDP_t		8.98E-07	-3.537336	0.0009
$HOUSE_t$		0.064025	-1.702706	**0.0946**
$INDU_{t-1}$		0.020078	0.353934	0.7248
R-squared	0.199547			
Dependent Variable: M3t				
GDP_t		1.06E-06	-2.626169	**0.0113**
$HOUSE_t$		0.076834	-0.902972	0.3706
$INDU_t$		0.024546	0.236422	0.8140
R-squared	0.121412			
Dependent Variable: $M3_{t-1}$				
GDP_t		1.08E-06	-1.430837	0.1585
$HOUSE_t$		0.076680	0.669083	0.5064
$INDU_{t-1}$		0.024047	0.229621	0.8193
R-squared	0.085413			

GDP – nominal GDP; HOUSE – Log of price change in S&P Case-Shiller Composite 10 Home Price Index; INDU –log of change in Dow Jones Industrial Index; BANK – Log of change in bank liabilities (SHADOW+ COMMERCIAL). Traditional bank liabilities (COMMERCIAL) refer to total liabilities of the commercial banking sector (line 19 of Table L 109 in Flow of Funds Accounts). Shadow bank liabilities (SHADOW, netted from overlaps with Table L 109) refer to the sum of total outstanding open market paper (line 1 of Table L 208), total repo liabilities (line 1 of Table L 207), net securities loaned (line 20 of Table L 130), total GSE liabilities and pool securities (lines 21 and 6 of Tables L 124 and L 125, respectively), total liabilities of ABS issuers (line 11 of Table L 126), and total shares outstanding of money market mutual funds (line 13 of Table L 121). M3 is reconstructed in the following way: the non-M2 components of M3 include institutional money funds (Bloomberg), large time deposits (Table L5 (line 9)) from Flow of Funds Accounts as well as total finance federal funds transactions and loans made under security repurchase agree liability (Table L 207 (line 1)). Source: Federal Reserve, Bloomberg, Author's regressions.

Results for EU indicate relationship between real estate prices, housing prices the stock market and M3 monetary aggregate (Table 3). M3 in EU is more correlated with the economy than in the US. It is not surprising, considering that securitization market is less developed in EU and economy is more reliant on traditional commercial banks.

Table 3.

Method: Least Squares
Included observations: 14, annual,1996-2010

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: $M3_t$				
$HOUSE_t$		0.228190	2.651364	**0.0243**
DAX_t		0.021809	-0.542683	0.5992
GDP_t		1.84E-08	1.535871	0.1556
R-squared	0.529111			
Dependent Variable: $M3_{t-1}$				
$HOUSE_t$		0.183087	-0.328642	0.7499
GDP_t		1.59E-08	3.379943	**0.0081**
DAX_{t-1}		0.017065	-0.253909	0.8053
R-squared	0.585855			

M3 - M2 + repurchase agreements + money market funds and papers + debt securities issued up to 2 years, log of change; GDP – nominal GDP, Region: EU15; HOUSE – Log of price change in Residential Property Price Index Statistics, Euro area 12; DAX – German Stock Exchange Index, log of price change. Source: Eurostat, European Central Bank, Federal Reserve, Bloomberg, Author's regressions.

Emerging market proxy is being considered through Czech Republic (Table 4). Czech Republic is often used in research as sample country for the level of its financial development and data quality (see Bezemer, Werner (2009)). Regression results show that Bank Assets (credit proxy) is significantly correlated with the economy (GDP, house prices, equity markets to some extent).

Table 4.

Method: Least Squares
Included observations: 8, after adjustment,
annual, 2000-2009.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: $BANK_{t-1}$				
$HOUSE_t$		0.198466	3.787196	**0.0193**
GDP_t		5.52E-05	4.350786	**0.0121**
$INDEX_t$		0.024191	2.024578	***0.1129***
R-squared	0.923002			
Dependent Variable: $M2_{t-1}$				
$HOUSE_t$		0.407989	0.731529	0.5050
GDP_t		0.000113	0.395255	0.7128
$INDEX_t$		0.049730	-0.449513	0.6763
R-squared	0.456755			

BANK – log of change in bank assets, sample bank – Komercni Banka, M2 - Monetary aggregate includes currency in circulation, demand deposits, time and saving deposits and foreign currency deposits, log of change; HOUSE - Price indices of selected kinds of real estate, log of change; INDEX – The Prague Stock Exchange PX-Glob Index, log of change; GDP – nominal GDP. Source: Czech Statistical Office, Bloomberg, Czech National Bank, Author's regressions.

These results are consistent with findings of Cull, Soledad and Peria (2007), who showed that foreign banks have access to a larger pool of loanable funds that can help them sustain higher levels of lending. Giannetti and Onegena (2005) employ a large panel of almost 60 000 firm-year observations on listed and unlisted companies in Eastern Europe to investigate the impact of foreign bank lending on firm sales, assets and leverage. They found that foreign lending stimulates growth in firm sales, assets and leverage.

Wu, Luca and Jeon (2007) find evidence that, consistent with the bank lending channel, foreign banks show smaller sensitivity to domestic monetary policy shocks than domestic peers. This is consistent with the existence of an internal capital market for global banks, that is, foreign subsidiaries have access to funds transferred by their parent companies that shields them from domestic monetary shocks. M2 in emerging markets, where credit is borrowed in foreign currency, loses its relevancy. Bank under study for credit proxy in Czech Republic has been part of Société Générale Group since 2001. Consequently it can have increased credit in the economy irrespective of Central Bank operations.

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