U.S. Monetary Policy, 'Imbalances' and the Financial Crisis[1]

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[1] Parts of this document draw on my previous work with Ricardo Caballero, Emmanuel Farhi and Hélène Rey (Caballero, Farhi and Gourinchas (2008a, 2008b), Gourinchas and Rey (2007)). It is also very much inspired by Caballero's recent Baffi lectures (Caballero, 2009). Many thanks to Olivier Jeanne, Maury Obstfeld and Ricardo Caballero for comments. Of course I am solely accountable for any mistakes.

I. Introduction

The proximate causes of the financial crisis that started in the summer of 2007 are by now well identified (Brunnermeier (2009)). Cheap and poorly documented mortgage financing helped fuel an unsustainable housing boom in the U.S. that came to a halt in early 2006. The broad-based reversal in the U.S. housing market triggered severe markdowns on high-risk mortgage products –the subprime crisis. Three factors ensured that the collapse in what was a minor segment of the U.S. financial markets turned into a global financial conflagration. First, profound structural changes in the banking system, with the emergence of the 'originate-and-distribute' model, coupled with an increased securitization of credit instruments, led to a decline in lending standards and a general inability to re-price complex financial products when liquidity dried-up. This lowered dramatically confidence between financial intermediaries, severely disrupting interbank markets and the flow of credit. Second, banks relied increasingly on short-term financing –either directly or through off-balance-sheet vehicles— exposing themselves to significant funding risk. Lastly, increased financial globalization and the strong appetite of foreign –especially European-- financial institutions for U.S. structured credit instruments quickly propagated the crisis to Europe and the rest of the World.

In these remarks, I propose to look beyond immediate causes, and to provide an assessment of more structural macroeconomic forces at play. More specifically, I will concentrate on two key popular explanations: the role of U.S. monetary policy in the years leading to the crisis, as well as the role of global external factors, in particular the growing external deficits of the United States (the so called 'Global Imbalances'). I argue that neither explanation is fully satisfactory. In line with Caballero (2009), I propose instead that the fundamental disequilibrium at the root of

the crisis, both in the U.S. and the global economy lies elsewhere: in the imbalance between the global demand for safe and liquid debt instruments –both within and outside the U.S.—and the limited supply of this asset. As I will argue, this "safe-asset" imbalance had repercussions both on the effect of monetary policy and on the pattern of external deficits of the U.S.

As a prelude, the next section reviews the state of the macroeconomic environment before the crisis. Section III concentrates on the conduct of monetary policy in the U.S. in the years before the crisis. Section IV reviews the evidence on the role "imbalances", global or otherwise. Section V concludes.

II. The State of Macro

A. Before…

It is useful to start by reviewing what we thought we knew around 2005.[2] Cyclical economy-wide fluctuations decreased steadily since 1980, in what came to be known as the "Great Moderation". The last two pre-crisis U.S. recessions on the record (1991 and 2001) were relatively shallow and short-lived. The battle against the high inflation of the 1970s was decisively won in the 1980s. By 2005, monetary conditions were fully under control, with stable and low consumer price inflation, perceived as the primary mandate of the Federal Reserve. To achieve this objective, the Fed had one powerful instrument: the policy interest rate (the Federal Funds rate) set through open market operations. Stable monetary policy anchored inflation

[2] See the recent IMF Staff Position Note by Blanchard, dell'Arricia and Mauro (2010) for additional details.

expectations, creating a stable environment, and allowing the economy to operate close to its potential output. As of 2005, the state of the macro-economy was widely perceived to be good.

There were two important blemishes, however, on this rosy picture: an increasingly overheating housing market, and growing external deficits of the United States. Between January 1997 and January 2006, the S&P Case Shiller Composite-10 Home Price Index increased by 128 percent in real terms (see **Figure 1**). Household leverage (the ratio of household debt to household disposable income) increased together with rising real estate prices. Yet, the general perception was that these developments were largely benign, for three reasons. First, in the context of rising house prices, debt service obligations of households could easily be met. Second, financial innovations (chiefly, increased securitization) were seen as positive factors, lowering the costs of borrowing for potential homeowners and reducing risks for lenders. With limited supply elasticity in the short run (the stock of housing increasing only slowly over time), it was only natural that the rise in housing demand increased prices. Lastly, while concerns about possible "froth" in the housing markets later emerged (Greenspan (2005b)), the general perception was that the U.S. economy could easily weather the necessary slowdown in house prices in some of the most speculative markets without impacting aggregate conditions. The extent of real estate losses would be localized, and in any case, the central bank claimed it remained vigilant and ready to offset declines in aggregate demand through appropriate interest rate policy.[3]

[3] See chairman Greenspan's testimony before the Joint Economic Committee, June 9, 2005.

Over the same period, the U.S. current account deficit, measuring roughly the excess of imports over exports, or equivalently the weakness of national saving compared to domestic investment, grew from 0.5 percent to 1.9 percent of the world's output (see **Figure 2**).[4] The counterpart of these persistent deficits was growing financing needs for the U.S. economy from the rest of the world. By 2005, these "global imbalances" were increasingly perceived as posing a serious threat to the global economy.

The danger, it was argued, was that the U.S. was becoming dependent on foreign financing. Like a typical emerging market economy running chronic current account deficits, it was at the mercy of a sudden withdrawal of foreign capital (a "sudden stop" in the jargon). The dire consequences of such a capital flow reversal were well understood by international macroeconomic scholars. Unable to borrow, the U.S. economy would face a sharp increase in interest rates, coupled with a collapse of its currency, triggered by foreign investors' refusal to purchase additional dollar assets. Domestic investment would collapse, national saving would rise (as required to close the current account deficit) with dramatic consequences on consumption, employment and aggregate activity. The contraction in the U.S. economy would then propagate to the rest of the world, in a potentially devastating global downturn.[5] While this was not the only possible interpretation (a point on which I will elaborate later), the view described above was widely shared and framed important policy discussions (e.g. G7 and IMF communiqués in 2003-2007).

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[4] From 1.5 percent to 6.5 percent of U.S. output.

[5] See Obstfeld and Rogoff (2000, 2005, 2007) for detailed discussions of the consequences of a sudden stop on the U.S. economy. See also Roubini and Setser (2005)

B. …and After

It is instructive to review what remains of the common wisdom in the light of the crisis. Consider first what we learned about the policy mix. It is now evident that stable monetary conditions do not *by themselves* guarantee a stable macroeconomic outcome. Instead, we have belatedly realized the extent to which the period preceding the crisis, despite stable consumer price inflation and output growth, was marked by an "orgy of leverage" on the part of households and financial intermediaries that was a leading cause of the crisis (Obstfeld (2009)).

In retrospect, it is also clear that this excessive leverage developed in the context of low nominal and real interest rates that fueled the rapid increases in house and asset prices. Once the crisis hit, it also became rapidly obvious that the policy interest rate was not a sufficiently powerful instrument to offset the contraction in aggregate demand and stabilize output. With federal funds rate rapidly approaching the zero nominal bound, traditional monetary policy had to be supplemented by vigorous fiscal policy as well as non-conventional monetary policy.

This naturally leads to the following question: to what extent was U.S. monetary policy in 2001-2007 responsible for the low real interest rates, the associated excessive build-up in leverage and subsequent collapse of the U.S. economy?

On the external front, the prevailing wisdom has also been challenged, although in a different direction altogether. The salient fact here is that global imbalances were not even remotely the trigger of the crisis. There was no collapse of the U.S. dollar. U.S. current account deficits contracted --a natural response in a recessionary context— yet the U.S. never faced any

difficulties in funding itself on international capital markets. In fact, quite the opposite happened. The U.S. currency strengthened, and foreign capital never fled the safe harbor of U.S. government debt markets. The particular vulnerability that worried many policymakers and academics alike –that the U.S. would face a 'sudden stop'—never materialized.

But this only constitutes prima-facie evidence against this particular transmission mechanism. It is conceptually possible that global imbalances contributed to the crisis through other channels. For instance, one may ask to what extent global imbalances facilitated the build-up in U.S. leverage by letting U.S. households, financial intermediaries, even federal and local governments rely increasingly on cheap financing from abroad.

In sum, the state of our understanding has been profoundly challenged. Traditional indicators of macroeconomic stability proved profoundly inadequate. Conversely, some supposedly well-identified risk factors did not materialize. The next two sections explore more specifically the role of monetary policy in the years 2001-2007 and the role of "imbalances", global or otherwise.

III. The Role of Monetary Policy, 2001-2007

Figure 3 plots the Federal Funds rate since 1999, together with various other market interest rates (that I will discuss later). The shaded areas report the NBER-dated recessions of March-November 2001 and December 2007--.

In January 2001, as the economy weakened rapidly following the collapse of the dotcom bubble, the Fed started to loosen monetary policy. The Federal Open Market Committee (FOMC) reduced the Federal Funds rate from 6.25 percent to 1.75 percent by the end of the year.[6] Policy rates kept going down in 2002 and 2003, although at a markedly slower rate, reaching 1 percent on June 25, 2003. The Federal Funds rate was set to stay at this unusually low level for a full year, until June 24, 2004. Two considerations motivated the decision to maintain low nominal interest rates over that period. First, employment was recovering more slowly than expected from the 2001 recession (the "jobless recovery"). Second, the FOMC was seriously concerned about the risks of a Japanese-style deflation, following the collapse of U.S. equity markets. The perceived danger was that the Fed would be forced to lower its policy rate to zero. In order to avoid this undesirable outcome, the FOMC started to provide "forward guidance", i.e. to announce that monetary policy would remain accommodative for an extended period of time, so as to anchor expectations of moderate price inflation (see Bernanke (2010) for a discussion). As deflationary risks started to fade and the economy's recovery took hold, the FOMC shifted towards tightening its monetary stance. Starting in June 2004, the FOMC increased interest rates gradually and measurably until June 29, 2006 when they reached a plateau of 5.25 percent.

Many voices are now arguing that the extended period of low policy interest rates between June 2003 and June 2004, followed by a period of "measured" rate hikes is directly or indirectly responsible for the crisis: policy rates were too low, for too long, fueling the housing boom and ultimately destabilizing the U.S. economy (Taylor (2007, 2009, 2010)).

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[6] This period also includes the FOMC's interest rates cuts after the 9/11 attacks.

A. The Taylor rule critique

Taylor's argument relies in large part on the deviation of policy rates from the predictions of his "Taylor rule" between 2002 and 2007 (Taylor (2007)). The traditional Taylor rule sets the overnight federal funds rate as a function of two factors: the deviation of the current inflation rate from the policymakers' target inflation, and the output gap. The precise formula for the original Taylor (1993) rule takes the following form:

$$i_t = 4 + 1.5(\pi_t - 2) + 0.5\, z_t$$

Where i_t is the overnight federal funds rate (the policy rate), π_t is the actual inflation rate and z_t is the output gap, expressed as the percentage deviation of output from 'potential output'. The rule assumes a target inflation of 2 percent, and a target real interest rate also of 2 percent. As is widely known, the rule prescribes that the Fed tightens monetary policy somewhat aggressively (i.e. with a coefficient above 1) when inflation is above its target ($\pi_t > 2$), and also, but less aggressively, when the economy is in danger of overheating ($z_t > 0$). **Figure 4**, from Bernanke (2010), compares the target federal funds rate to the Taylor rule prescription, illustrating the extent to which policy interest rates were apparently "too low for too long." A Fed operating under such a rule would have started a tightening cycle in 2002, with policy rates predicted to climb to 7.25 percent by 2006. Using simulations of the number of housing starts between 2000 and 2006, Taylor (2007) argues further that this tightening would have avoided much of the housing boom.

There are a number of reasons, however, why this conclusion is far from warranted. First, one needs to recognize there can be significant disagreement about the two key "ingredients" that go into the Taylor rule: the measure of inflation and of the output gap. Bernanke (2010) argues that

the Fed was acting in line with "a" Taylor rule, once we feed in the proper ingredients. Reasonable people can disagree about the measure of inflation (CPI, PCE, headline, core, expected, current…), and the measure of the output gap (based on marginal costs, unemployment, a production function, HP filter,…) that should be fed into the rule. The lack of consensus on some of these measures simply reflects the difficulty in measuring them correctly. Naturally, central bankers should be –and often are-- cautious of any particular estimate. Yet, overall, the Fed provides solid arguments that the policy rate was not excessively low in 2001-2004, given the deflationary pressures it perceived at the time (i.e. a low $(\pi_t - 2)$) and the weak recovery from the recession (i.e. a low z_t). More, substantively, it would be a mistake to turn the debate about the role of the Fed into a narrow discussion of the "correct" measure of price inflation and of the output gap. While there are important technical discussions to have on this topic, this is not where we should focus our attention.

Second, it is important to keep in mind what criteria one should use when comparing actual monetary policy decisions to the predictions of the Taylor rule. The original rule was designed as an ad-hoc rule capturing relatively well the interest rate decisions of the FOMC during the years 1987-1992. This was essentially a "positive" (i.e. descriptive) exercise, although the motivation for the rule itself came from first principles and a careful discussion of monetary models developed in the 1970s and 1980s. The rule's "normative" (i.e. prescriptive) significance came from two sources. First, there was the widely shared view that the conduct of monetary policy between 1987 and 1992 was very successful. Second, the development of New-Keynesian monetary models allowed researchers and central banks to verify that rules of the type Taylor analyzed (although not necessarily the specific one he proposed) can have good properties for

price stability.[7] In addition, theoretical research identified conditions under which monetary rules of this type would stabilize both inflation and, as a by-product, output at its potential level (i.e. a zero output gap).[8]

It follows that the proper way to evaluate the Fed's performance, in relation to the predictions of a Taylor rule, is by its ability to stabilize prices and output. In particular, it does not seem logically appropriate to argue that the Fed committed policy mistakes simply because a crisis subsequently occurred, especially if that crisis is of a nature that did not figure in the considerations behind the original discussions and motivations of the proponents of Taylor-type rules. In other words, to make the case against the Fed's policy, proponents of Taylor-type rules would need to argue that it led to significant price or output instability.

Here the record is scant. **Figure 5** reports the 12-month annualized headline and core (i.e. excluding energy and food) CPI inflation since 2000, together with the target federal funds rate. Core CPI inflation remained below 2 percent in 2003 and 2004 and only approached 3 percent in Sept. 2006. Headline inflation was higher during some of the period, due to the rapid increase in energy prices, but more importantly was more volatile. There are three sound reasons why monetary policy often targets the more inertial components of the consumer basket. First, tautologically, more volatile components are less rigid, and therefore can rapidly adjust in response to changes in demand and supply without any need for monetary intervention. Given

[7] A key property is that the rule satisfies the "Taylor principle" that nominal interest rates respond more than one to one to inflation rates, as is the case in the original rule.

[8] Blanchard and Gali (2007) call this the "divine coincidence".

the delays in the transmission of monetary policy to the broader economy, responding to changes in the volatile components of the price level could conceivably exacerbate rather than reduce macroeconomic instability. Second, energy prices are intimately connected to financial markets. Durable energy inputs are assets. Gasoline or heating oil can be stored, and movements in their price reflect also arbitrage conditions prevailing in financial markets. Using interest rate policy to control the rise in energy prices raises broader questions about the role of monetary policy in controlling asset prices (I will have more to say about this later). Lastly, while energy costs represent a small share of household expenditures, they are highly visible and resonate powerfully in the public's perception of inflation. What is of paramount importance for central banks facing rapidly increasing energy prices, is to avoid "second round" inflation caused by the unmooring of inflation expectations that would spread to core inflation.

Figure 6 reports long run inflation forecasts from two sources: the Survey of Professional Forecasters 10 year ahead forecast inflation, and the break-even inflation implicit from U.S. Treasury inflation protected securities (TIPS), a measure of the market's expectation of inflation. Obviously, inflation forecasts remained well-anchored throughout the period. Indeed they remained stable to this day. According to the professional forecasters, 10-year ahead inflation forecasts has been 2.5 percent since 1998! Economists are always somewhat suspicious of survey-based forecasts. But the break-even inflation from the TIPS data tells a similar story. It does show more variation, increasing from 1.5 percent in 2002 to 2.7 percent in 2005 before falling back. This hardly constitutes unstable monetary conditions. The period is, of course, also one of stable output growth, recovering from the 2001 recession. By the standard that Taylor rule

proponents purport to adopt, then, there is very little evidence that the Fed's actions between 2001 and 2007 were inappropriate.

B. Low or Negative Real Interest Rates

While a narrow Taylor-rule critique appears relatively weak overall, the broader question raised by Taylor (2009) remains relevant: did low policy rates contribute to the crisis? In a recent paper mostly focused on exit strategies, Hoenig (2010) notes that the real federal funds rate (i.e. the target federal funds rate minus annual core PCE inflation) was negative 40 percent of the time in the 2000s. The other decade with frequently negative real policy rates was "during the 1970s, preceding a time of economic turbulence" (p9). This parallel seems unwarranted since it misunderstands the reasons why real policy rates were negative then and now. In the 1970s, real federal funds rates were low because of high and increasing inflation, i.e. the very definition of monetary instability. Now, as argued above, inflation has remained low, and inflation expectations remained soundly anchored. Real rates were negative between 2002 and 2004 as the Fed was trying to fend off the threat of deflation.[9]

The more sensible argument is that low (although not necessarily negative) real interest rates can be a source of financial instability. The relevant observation here is that low real interest rates can be a problem especially in periods of robust growth, like the one the world economy, and the U.S., experienced in the years preceding the crisis. Low real rates can be dangerous in a rapidly

[9] Real target rates have, of course, been mostly negative since the onset of the crisis, as the Fed pushed its target rate to 0-0.25 percent.

expanding economic environment because they relax long term budget constraints, allowing households, governments and firms to be lulled into a false sense of financial security and leading to dangerous increases in leverage and potential misallocation of capital.

It is also well known, from a theoretical point of view, that an economy with low real interest rates relative to its growth rate can be prone to "rational bubbles", i.e. the emergence of non-fundamental valuations for existing or new assets, sustained not by the naiveté or irrationality of some investors, but by the correct belief that they will on average deliver a return comparable to other assets. While this belief may be correct at the level of individual investor, the emergence of bubbles coupled with high leverage can make the economy as a whole much more vulnerable to a sudden change in economic conditions, whether a decline in wealth (as many households experienced as house prices declined), or an increase in interest rates (as many levered-up financial intermediaries effectively experienced during the run on the repo markets).

An interesting possibility is that favorable supply shocks (technology, globalization) may provide a fertile ground for asset bubbles, as they generate optimism about asset returns, yet depress inflation, inducing central banks to maintain policy rates at low levels. In the years leading to the crisis, the growing integration of manufacturing China and other emerging economies into the global supply chain may have played such a role.

Recent history is littered with episodes of low real interest rate followed by crisis. The Latin American debt crisis of the early 1980s followed an extended period of low world real interest rates that lead too many emerging market Latin American economies to borrow to unsustainable

levels. The 1997 Asian can be interpreted in the same light, as massive private capital flows into emerging Asian economies in the context of supercharged growth rates led to a massive increase in leverage in Asian financial institutions and the emergence of bubbles. The same dynamics were at play even more recently in Ireland, Spain, Portugal and Greece following the adoption of the European common currency. The reduction in long term borrowing costs matched by a rapid economic catch-up fuelled unsustainable housing booms, largely financed by external credit. It is not always easy to identify when real interest rates become too low and formal tests are not available. Nevertheless, prolonged periods of low interest rates, especially in the context of rapid economic growth, should always be viewed with extreme caution by policymakers.

C. Short and Long Rates

It is also important to observe that the rate that is relevant for market developments may not be the policy rate set by the central bank. Under normal conditions, monetary policy operates by affecting both short and long term interest rates. The former are important for the banking system, the latter for the business conditions that firms and households face when borrowing and lending. Theoretically, a credible central bank can stabilize the economy with relatively small changes in the short-term policy rate, as long credible signals about the future direction of short-term rates move the long-term market-based interest rates in the appropriate direction.

From that point of view, something surprising happened when the Fed started tightening monetary policy in June 2004: longer maturity interest rates did not respond much. **Figure 3** reports the yield on 10-year constant maturity Treasury securities together with the target federal

funds rate. As already noted, between 2001 and 2004 the policy rate decreased by 5.5 percent, from 6.5 percent to 1 percent. Over the same period, the yield on 10-year Treasuries decreased by 3.57 percent, from 6.77 percent to 3.2 percent.[10] Between 2004 and 2007, on the other hand, the policy rate increased 4.25 percent, to 5.25 percent, while the yield on 10-year notes increased only 2 percent, to 5.2 percent. **Figure 7** shows that the same pattern is apparent in real rates. World short term interest rates exhibit a pattern very similar to U.S. short rates, with a tightening between 2004 and 2007. Despite this, U.S. long rates remain flat or declining over the same period. Testifying before the Committee on Banking, Housing and Urban Affairs in February 2005, chairman Greenspan expressed some surprise with the lack of response of long term interest rates: "For the moment, the broadly unanticipated behavior of world bond markets remains a conundrum. Bond price movements may be a short-term aberration, but it will be some time before we are able to better judge the forces underlying recent experience" (Greenspan (2005a)).

What accounts for this puzzling pattern? One important clue comes from the behavior of world saving. **Figure 8** reports gross world savings, as a fraction of world output. Starting in 2002, the world saving rate increased very sharply, from 20.5 percent to 24.5 percent in 2007. This increase has two sources: the growing saving rates of emerging Asia, including China, and of oil and commodity producing economies, following the rapid rise in energy and commodity prices. In a global economy, an increase in global savings, regardless of its origins, will depress world real interest rates. I will come back to the role of global factors in the next section, but it is

[10] The 10-year yield peaked and bottomed out well ahead of the policy rate, as should be the case if markets anticipate the change in course in policy.

important to note here that the Fed, by its own admission, felt that it did not have as much control over the yield curve as it perhaps wished. The final result was that long term real rates remained low, making borrowing attractive for households.

D. Monetary Policy and Financial Instability

There are two ways to look at this observation. First, one may argue that the FOMC should have raised policy rates faster and more aggressively in 2002-2006, so as to counteract the depressing effect of the increase in world savings on long term real rates and avoid potential future financial instability. Following the same line of reasoning, the Fed should have stepped on the brakes as soon as evidence of excessive household and financial sector leverage emerged. In short, the Fed should be asked to use interest rate policy to "lean against the wind".

The Federal Reserve position on this question was simple.[11] It argued (a) that reacting to asset prices was not desirable from the point of view of price stability; (b) that bubbles were difficult to identify; (c) that interest rate policy could effectively deal with the consequences of a burst bubble if it impaired the broader economy ("mopping up") and (d) that the effectiveness of raising policy rates for pricking bubbles was highly uncertain.

[11] See Mishkin (2007) for a clear exposition.

This view was strengthened after the successful response to the 2001 dotcom collapse, in lulling us, in retrospect, into a dangerous sense of complacency.[12] Two related remarks are useful here. First, there is a growing perception that some bubbles may not matter as much as others. Asset bubbles where investors have relatively little leverage may pose little systemic risk. The 2001 dotcom bubble was, in retrospect, of that garden-variety type. Asset bubbles with highly leveraged investors, firms or households can pose a more systemic threat. If correct, this suggests that monetary authorities should look more closely at the evolution of credit aggregates and investors' leverage.[13]

Perhaps more importantly, underlying this benign attitude was the growing belief that financial markets would find it in their interest to self-regulate and self-correct (the so-called "Greenspan doctrine") so that global risks would remain contained. This belief, and the notion that the Fed would be able to "mop up" after the collapse are two clear casualties of the recent crisis.

Yet, it does not follow that the FOMC should have raised the federal funds rate more aggressively to stem some of the financial excesses. The reason is that the other arguments advanced by Fed officials remain relevant. In an environment with stable prices and stable output growth, such increase would have had some adverse consequences on economic activity. In effect, it would have required that the Fed chase two objectives –financial and price stability— with only one instrument: the policy rate.

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[12] See Borio and White (2004) for an elaboration on the argument that periods of macroeconomic stability or successful stabilizations may increase future financial instability.

[13] See White (2009).

It is a generally sound principle of policymaking that one instrument can only achieve one objective. The Federal Reserve is thus correct when it asserts that incorporating asset prices in its objective function can have adverse consequences on price stability (a) or that it may not be the correct instrument altogether for fighting asset bubbles (d). Evidence on this last point is provided in the contrasting statements about the effect an increase in policy rates would have had on the housing bubble in Bernanke (2010) and Taylor (2007).

It does not follow either, as the Fed tried to argue, that the optimal policy is to ignore financial market developments until after calamities have happened, under the optimistic belief that markets will look after themselves.

The correct answer, of course, is to deploy multiple instruments, to achieve multiple objectives. As Blanchard et al (2010) emphasize, the "good news" is that we do have multiple instruments, from non-conventional monetary policy (quantitative or credit easing) to cyclical regulatory instruments. Whether these instruments have to be centralized at the Federal Reserve or not is a difficult question that I will not address here. The overall failure of the Fed –and of most economists-- was not one of policy, but one of imagination: after it grew increasingly concerned about a possible housing bubble (in part under the prodding of Governor Ned Gramlich), the Fed failed to stir a debate on the proper regulatory changes that could have made a difference.

IV. 'Imbalances'

I now turn to the question of whether imbalances, global or otherwise, played a part in the current crisis. As argued earlier, widespread initial worries that large external deficits would make the U.S. vulnerable to a classic "sudden stop" crisis proved entirely unfounded. The question that remains before us is whether 'imbalances' –and of what nature-- contributed to the crisis –and through what channel.

A. Four Phases of Global Imbalances: 1990-2007

Consider **Figure 2** again. Together with the U.S. current account, it plots the current account of continental Europe and Japan, oil producing economies, emerging Asia ex-China, and China.[14] Four phases stand out:[15]

- Between 1990 and 1997 U.S. external deficits were quite moderate, between 1 and 2 percent of U.S. output.
- The 1997 Asian financial crisis forced a decrease in investment and an abrupt current account reversal in that region. At more or less the same time, the U.S. experienced an investment surge, linked to the high-tech boom. The net result was that the higher desired (net) savings from the rest of the world met the higher desired (net) borrowing of the U.S., without much impact on world real interest rates. U.S. external deficits worsened

[14] Continental Europe includes: Austria, Belgium, France, Germany, Ireland, Italy, the Netherlands, Spain, Denmark, Iceland, Sweden and Switzerland. Oil producing countries include: Canada, Norway, Mexico, Venezuela, Russia, Saudi Arabia, Iran, Nigeria, Kuweit, Libya, Oman and Bahrein. Emerging Asia ex-China includes: Indonesia, Malaysia, the Philippines, Singapore, Thailand and South Korea.

[15] See Blanchard and Milesi-Ferretti (2009).

dramatically, to 4 percent of U.S. output (1.4 percent of world output). Reflecting the prevailing optimism about the U.S. economy, **Figure 9** shows a significant share of U.S. gross capital inflows went to direct investment and equity portfolios.

- As the dotcom boom turned to bust in 2001, global (and U.S.) desired investment declined, but not global desired savings. In equilibrium, world saving and world investment must always equal each other. As Bernanke pointed out in his insightful 'Savings Glut' lecture (Bernanke (2005)), "The textbook analysis suggests that, with desired saving outstripping desired investment, the real rate of interest should fall to equilibrate the market for global saving." Indeed, that period is marked by a decline in world real interest rates (**Figure 7**) and a concomitant decline in world saving (**Figure 8**). What is relevant for us is that this decline in world savings was not evenly distributed. In particular, U.S. savings declined even more than U.S. investment, so that the current account deficit of the U.S. worsened to 5.3 percent of U.S. output by 2004. I will come back to that point later, but an important clue is the significant reallocation in the composition of U.S. gross capital inflows, towards debt flows, especially Treasury and agency debt, and the increasing role of official investors and dollar reserve accumulation (**Figure 9 and 10**).
- Lastly, between 2004 and 2007, global saving increased again, as a result of the rapidly growing saving rates of China and oil producers. This pushed down real interest rate further. That period sees a moderate stabilization of U.S. external deficits at elevated levels (5 to 6 percent of U.S. output) with continued heavy reliance on debt financing and reserve accumulation by foreign central banks.

B. What Imbalance?

The view that global imbalances played a significant role in the current crisis combines several of the ingredients already mentioned (Portes (2009), Obstfeld and Rogoff (2009)).

It starts by noting that the large current account surpluses of emerging Asia and oil producing countries, especially after 2004, exerted downward pressure on U.S. interest rates. The abundance of foreign capital made borrowing easy and cheap in the U.S. These low interest rates, in turn, set in motion a "search for yield" (Portes (2009)) and "fed into a powerful multiplier mechanism based on unrealistic expectations, asset market distortions, and agency problems, notably in markets for housing finance. The resulting asset appreciation, especially housing appreciation, was a major driver of high consumer spending and borrowing." (Obstfeld and Rogoff (2009), p25)

Some elements of this interpretation are largely correct in my view: excess savings lowered real interest rates after 2004. Low interest real interest rates fueled leverage. Leverage bred financial instability and the crisis. Nonetheless, I will argue that this view is incomplete, as it does not focus on the core of the problem, the safe asset imbalance. As I will argue, that imbalance is conceptually separate from the structure of global imbalances.

To highlight as starkly as possible the role of global imbalances, consider the following conceptual experiment. Imagine that in the year 2006 (for illustration), the U.S. and the rest of the world agreed to implement a set of policies to eliminate global imbalances. In practice, this would have meant higher national savings (e.g. public savings) in the U.S. and other deficit

countries, and higher aggregate demand (e.g. private consumption) in China and other surplus countries.[16] While such a policy would have eliminated global imbalances, it would have had a limited impact on global savings and investment. Since it is global savings and investment that determine global real interest rates, the latter would also have remained unchanged: U.S. borrowers and lenders would have faced the same low real cost of funds. It follows that the same "search for yield" would have taken place. Households and financial intermediaries would have increased their leverage etc….. In short, eliminating global imbalances in this fashion would have had little effect on interest rates and the world economy would most likely have barreled down the same path….

Importantly, as pointed out by Obstfeld (2009), the explosion in cross border financial trades and the corresponding "pyramid of interdependent credit risks" (p4) could still have occurred, even without any current account imbalances. This implies that the overall structure of gross financial flows would have remained essentially the same, with high foreign demand for U.S. debt instruments.

Conversely, suppose now that the coordinated policy prescription had been to reduce desired savings or increase desired investment proportionately in all countries in the world. With lower desired saving and higher desired investment, world interest rates would have risen sufficiently to restore a global equilibrium. Importantly, global imbalances would have remained mostly unchanged, yet higher world interest rates would have dampened speculative behavior.

[16] Such policies were advocated at the time by the IMF, as part of its revised surveillance mandate.

It follows that the geography of imbalances is not, by itself, responsible for the crisis.[17] What is central, and what we need to understand, is the structure of the global demand for saving and its impact on world interest rates.

Caballero et al (2008a) expand on that point. They argue that the Asian crisis of 1997, the subsequent rapid growth of China and other East Asian economies and the associated rise in commodity prices in recent years reoriented capital flows from emerging markets toward the United States. In their analysis, emerging markets and commodity producers, countries with rapidly increasing wealth, faced a shortage of stores of value. In other words, their financial development lagged behind their economic development. Lacking liquid, sound financial instruments to store their newly created wealth, these emerging economies perceived the U.S. (and other developed economies) as providers of these financial instruments, with their deep well-developed, and *supposedly* well-regulated, financial markets.

Three factors made U.S. financial markets and dollar assets the destination and instruments of choice. First, the U.S. dollar remains the world's reserve currency. With deep financial markets (especially the government bond market), it could absorb the foreign demand for capital. Second, some central banks, including but not limited to the People's Banks of China, actively sought to

[17] From that point of view, it is interesting to note that the developed economies that experienced the worst stock market declines during the crisis are countries that could exploit regulatory arbitrage and issue ABCP, not the countries with the largest current account deficits. Along that dimension too, the geography of global imbalances is relatively uninformative. See Acharya and Schnabl (2009).

accumulate larges dollar reserves either to insure against future "sudden stops" or to sterilize their growing external surpluses and maintain a stable value of their currency relative to the U.S. dollar. Third, many commodity and oil producers also maintained pegs to the U.S. dollar. Faced with increased external revenues as energy and commodity prices soared, they too, turned to U.S. asset accumulation through their central bank or sovereign wealth funds.

The emphasis --further developed in Caballero (2009), is on the growing demand for safe, liquid debt instruments from emerging economies and commodity producers. A key observation made in that paper is that this excess demand for safe assets was not limited to emerging economies or their central banks. The entire world, including U.S. financial intermediaries, European banks, money market funds etc…, developed an increasing appetite for safe debt instruments. However, a substantial impetus for this demand originated with emerging economies.

The argument can be summarized as follows:

- The 2001 dotcom crash and the 9/11 attacks led to a reallocation of capital towards safe assets as the world came to realize that there was substantial risk in U.S. assets. This reallocation is evident along the international dimension in **Figure 9 and 10** where we see the large increase in the share of debt, especially Treasuries and agency debt, in gross capital inflows between 2001 and 2004.
- As the demand for safe assets outstripped supply (constituted of triple-A corporate bonds, government securities and agency debt backed by the securitized mortgages of low-risk borrowers), this created an irresistible profit opportunity for the U.S. financial system: to

engineer “quasi” safe debt instruments by bundling riskier assets and selling the senior tranches (originate and distribute).

- This allowed the U.S. financial system to transfer part of the demand for safe liquid debt instruments onto ultimately higher risk assets, fueling increases in asset prices across the board and allowing more borrowing. A feedback loop was created that allowed more risky assets to be created and securitized into ‘safe’ ones, backed by the expectation that their value would not fall. Poor credit rating and greed played their part too!
- Creating synthetic *supposedly* triple-A assets on such large scale allowed supply to meet demand, at the cost of making the financial system vulnerable to systemic risk, since the correlation of synthetic asset distress and systemic distress is much higher than for single bonds of equivalent rating (Coval, Jurek and Stafford (2008)).
- When the crisis reached the systemic stage, the only *bona-fide* safe debt instruments left were U.S. Treasuries. By then, even triple-A corporate bonds and agency debt faced significant liquidity and counterparty risk. As global investors sought to re-price risk and deleverage, the demand for Treasuries surged, pushing yields to all time lows. This explains the strength of the dollar at the worst of the crisis and the ease with which the U.S. was able to fund its deficits, despite the crisis originating here.

In other words, the U.S. <u>did</u> experience a “sudden stop”. But this sudden stop was not along the external dimension of the global imbalances. Instead, it was along the internal lines of the safe debt instrument imbalances: market participants refused to extend credit to institutions holding securitized assets, freezing suddenly the entire securitization industry and repo markets. Instead, both domestic and foreign investors rushed to the safety of U.S. Treasuries.

C. Global and Safe Asset Imbalances

As emphasized earlier, the link between global and safe asset imbalances comes from two observations. First, the U.S. has long played the role of a global provider of liquidity to the rest of the world. **Figure 11**, from Gourinchas and Rey (2007) shows the fraction of liquid liabilities (debt, bank loans and short-term credit) in total U.S. gross external liabilities, and the fraction of risky assets (equities and direct investment) in total U.S. gross external assets between 1952 and 2004. The figure illustrates how the U.S. has historically provided liquidity to the rest of the world: it borrows by issuing safe liquid debt assets (Treasuries, bonds) and invests in risky ones with a longer maturity (equities and direct investment). This transformation of liquidity is an important global function of U.S. financial markets, reflecting partly the *perceived* depth and security of U.S. debt markets as well as the special role of the dollar as a reserve currency.

In recent years, this mechanism was exacerbated by the demand for reserves from foreign central banks. This demand for reserves was an important component of the overall safe asset imbalance and was largely directed towards dollar safe assets.

It follows that the U.S. financial system was perceived as uniquely positioned –although by no means the only one- to meet the demand for safe assets. This unique advantage proved a key factor of its ultimate instability.

V. Conclusion

In these remarks, I have attempted to establish the following points:

First, it is difficult to fault the conduct of U.S. monetary policy on the "narrow" objectives that it was assigned to achieve, especially in terms of interest rate policy. But the Fed missed part of the bigger picture. It –and most other observers with it-- failed to see the eventual threat that low or even negative real interest rates coupled with a credit boom posed to the stability of the financial system. The course of monetary policy between 2001 and 2006 caused no immediate threat to the economy. Nonetheless, because of a benign view of the risks in the financial markets, it did not engage in a productive discussion on how to control financial risks and limit the fallout from the housing and credit bubble, using other instruments than interest rate policy.

Second, the global increase in demand for U.S. debt assets after 2001, more than global imbalances per se, contributed to the decline in real interest rates that fueled the credit and housing bubble. The excess demand for safe debt instruments created conditions under which it became profitable for the U.S. financial sector to 'manufacture' pseudo triple-A assets that turned out to be extremely vulnerable in case of systemic distress. This imbalance and the regulatory failures of many advanced economies' financial systems lie at the heart of the financial crisis.

The unique position of the U.S. as a global provider of liquidity, and the important role of the dollar as a reserve currency played an important role in generating excess demand for safe dollar assets and global imbalances. The latter, however, were not the dominant driver of the crisis.

VI. References

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I. Figures

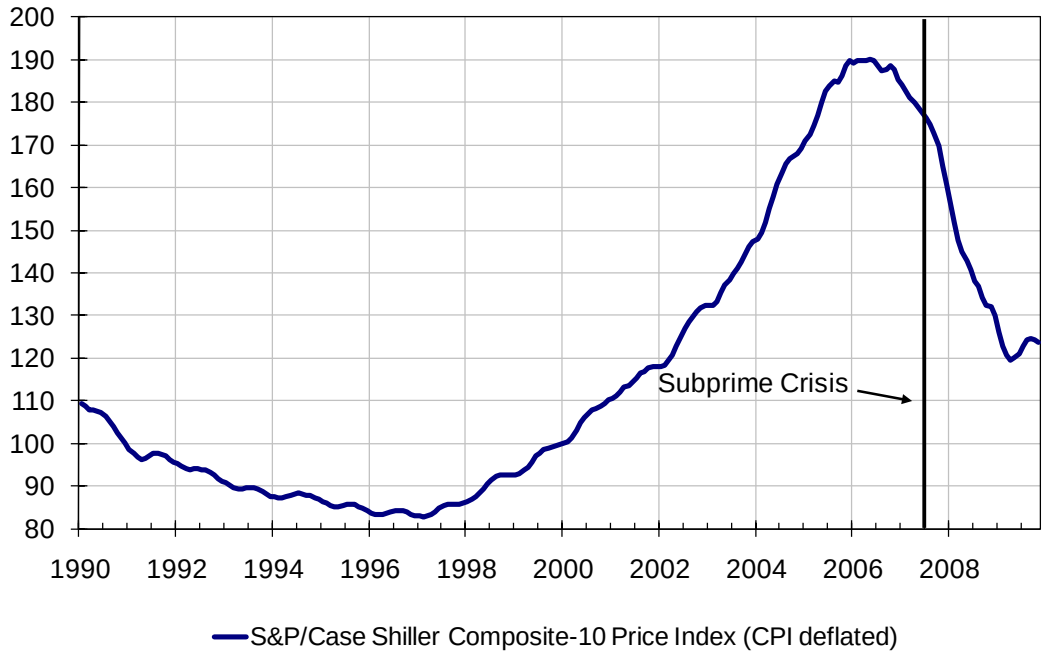

Figure 1: S&P Case Shiller price index (real). Source: S&P Case Shiller Composite-10 Home price index deflated by CPI for urban consumers (SA).

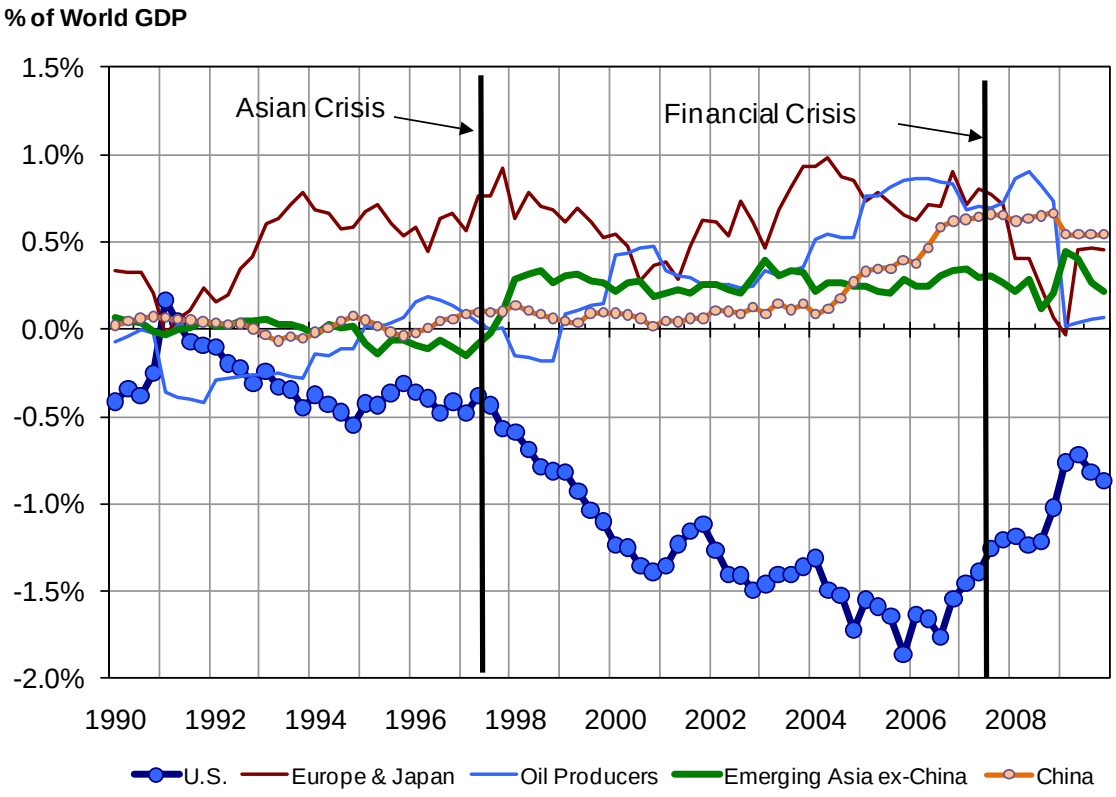

Figure 2: Global Imbalances. Current account deficits as a fraction of world GDP. Source: IMF, WDI, OECD.

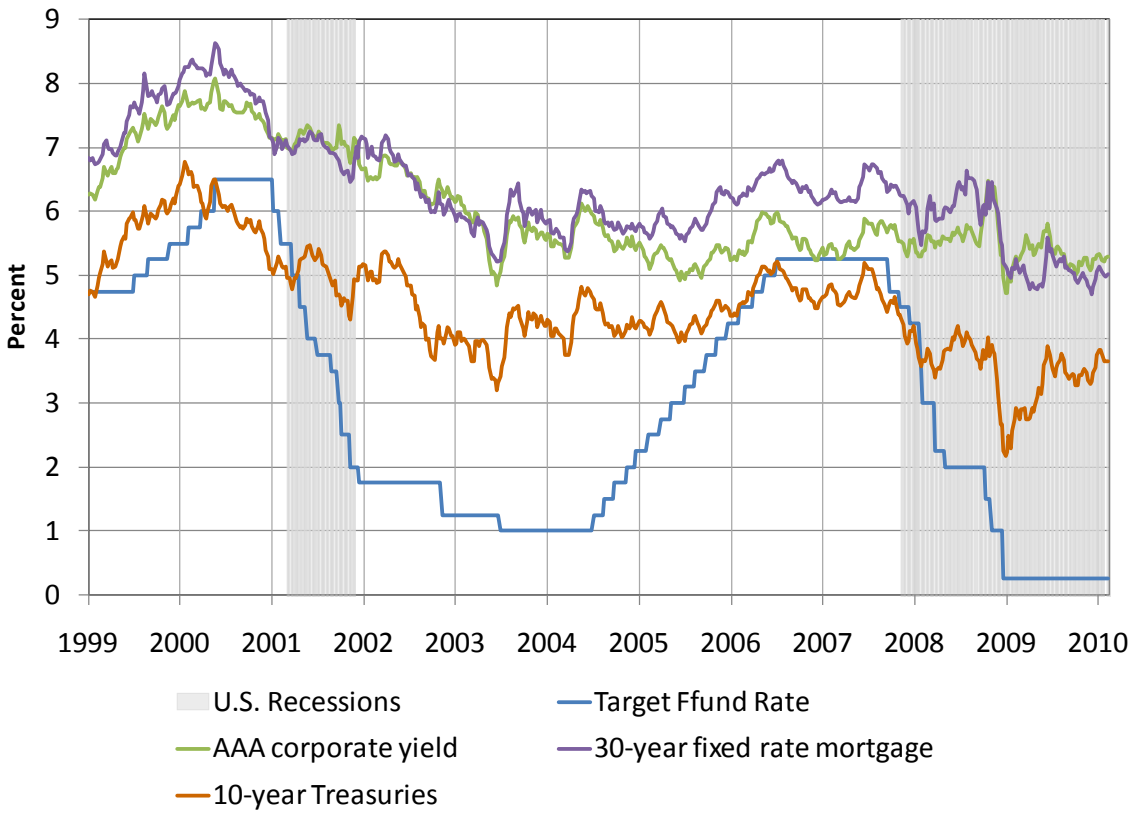

Figure 3: U.S. Interest Rates. Source: Federal Reserve

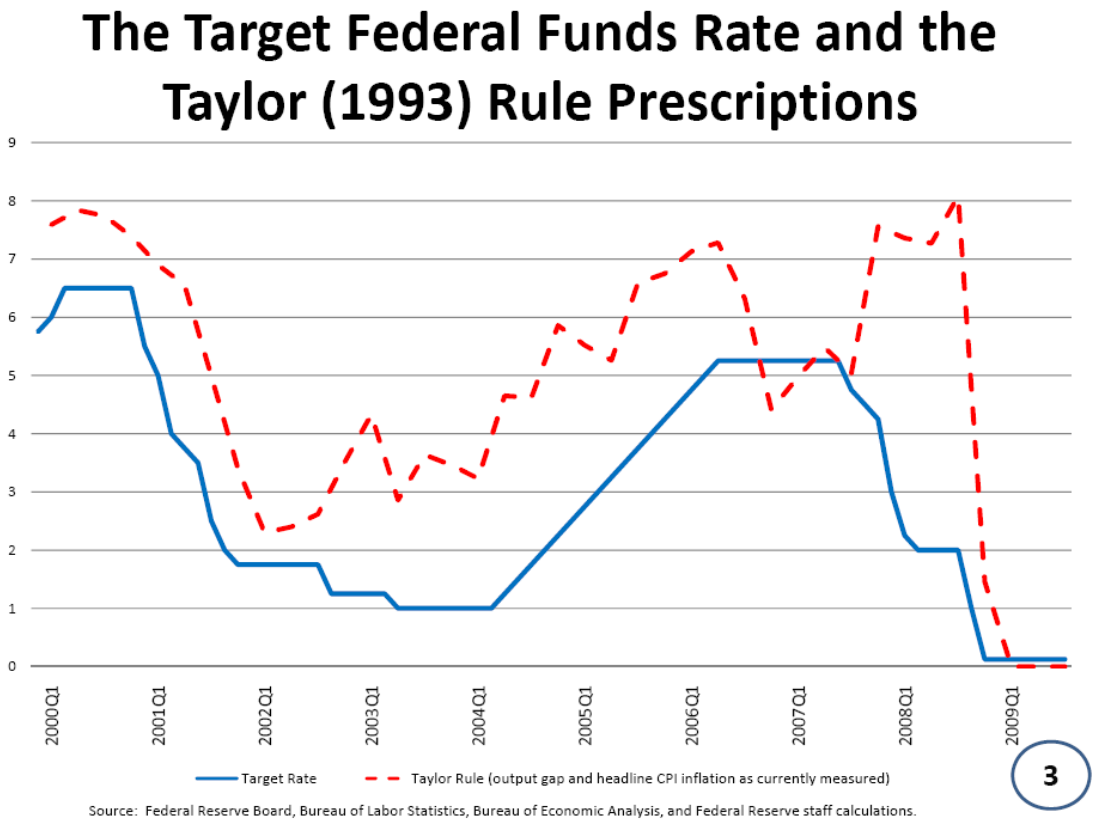

Figure 4: Federal Funds Rate and Counterfactual Taylor rule rate. Source: Bernanke (2010)

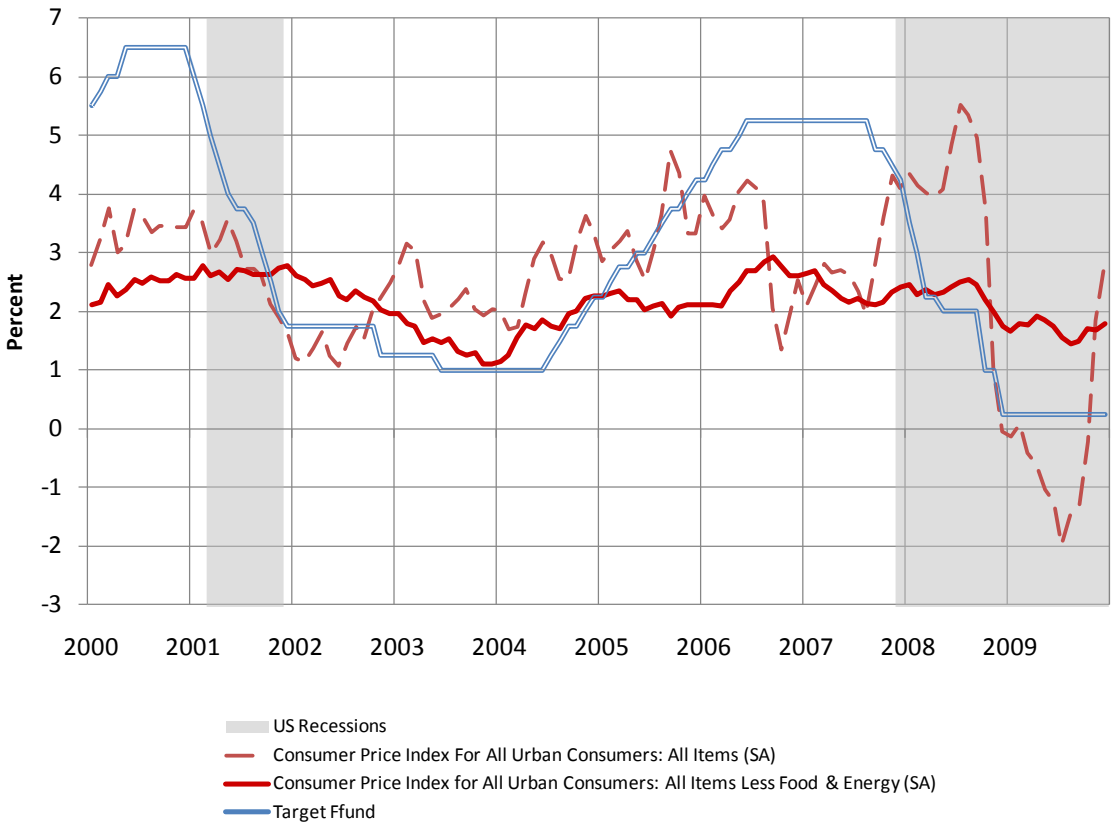

Figure 5: Inflation rate. Source: FRED database.

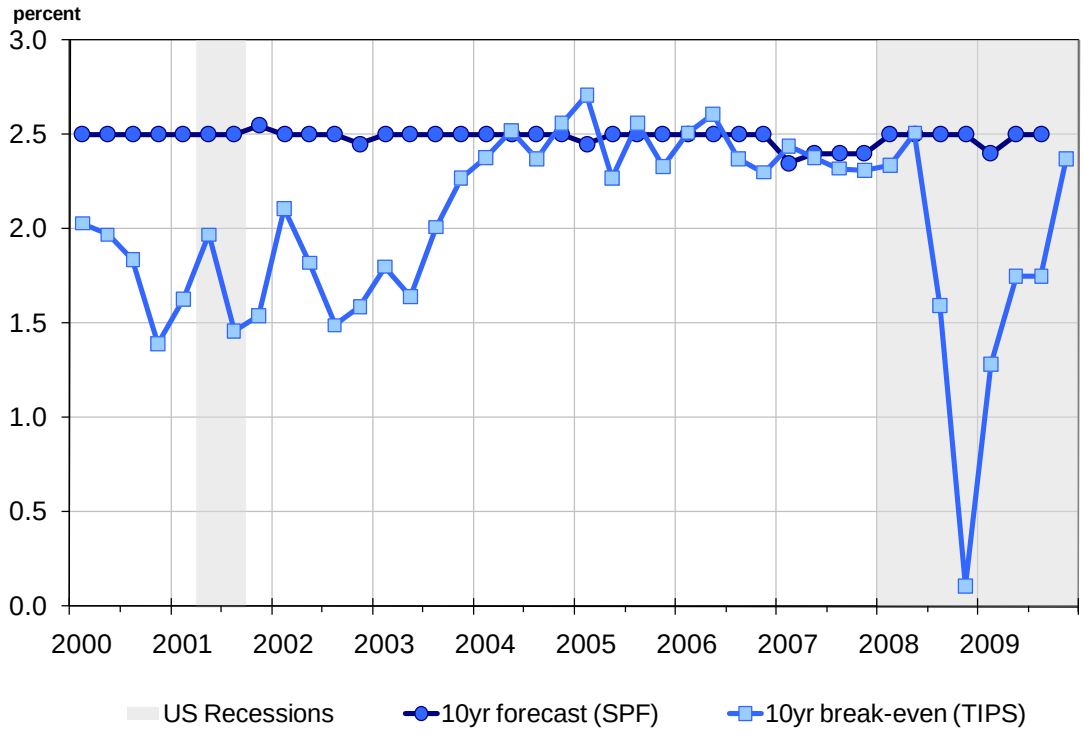

Figure 6: Inflation Forecasts. Source: SPF: Philadelphia Fed. TIPS: Federal Reserve

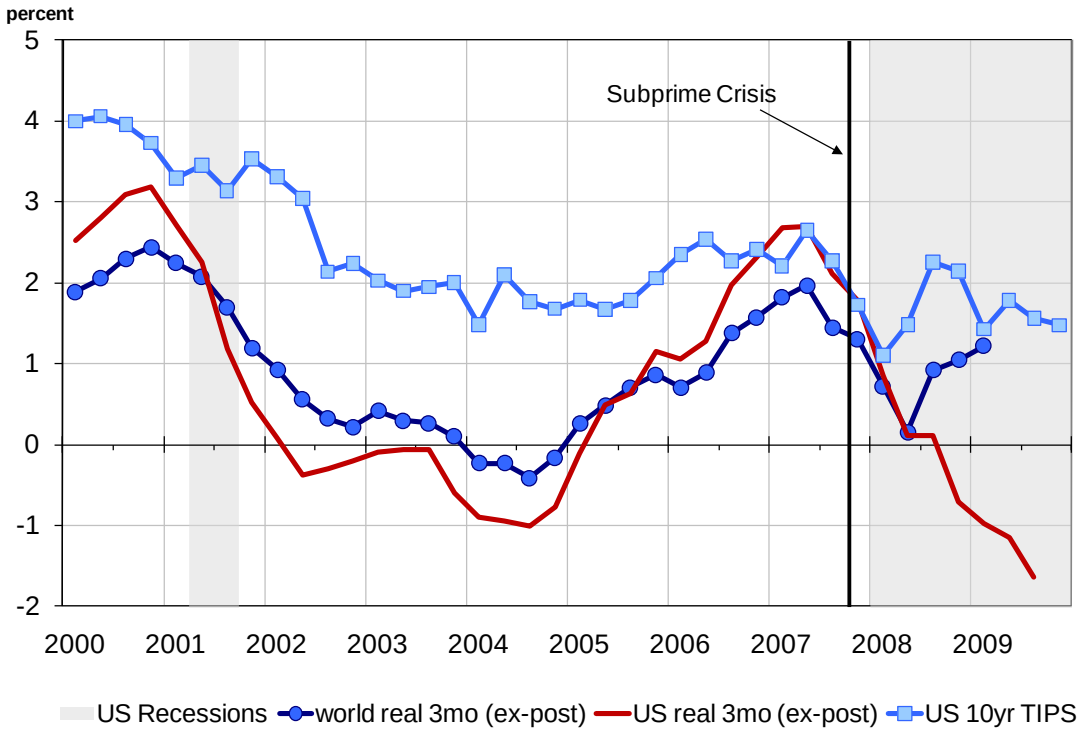

Figure 7: Real interest rates. Source: IFS, WDI, OECD.

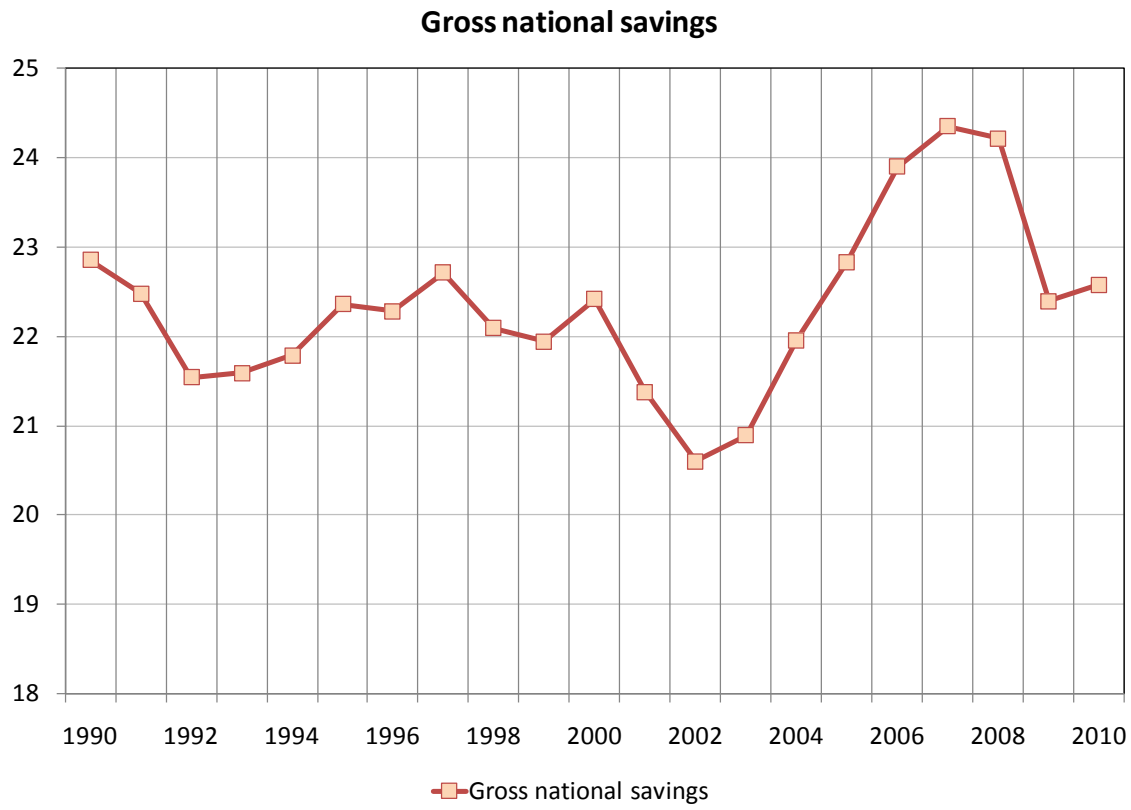

Figure 8: world saving rate. Source: WEO. Percent of world GDP

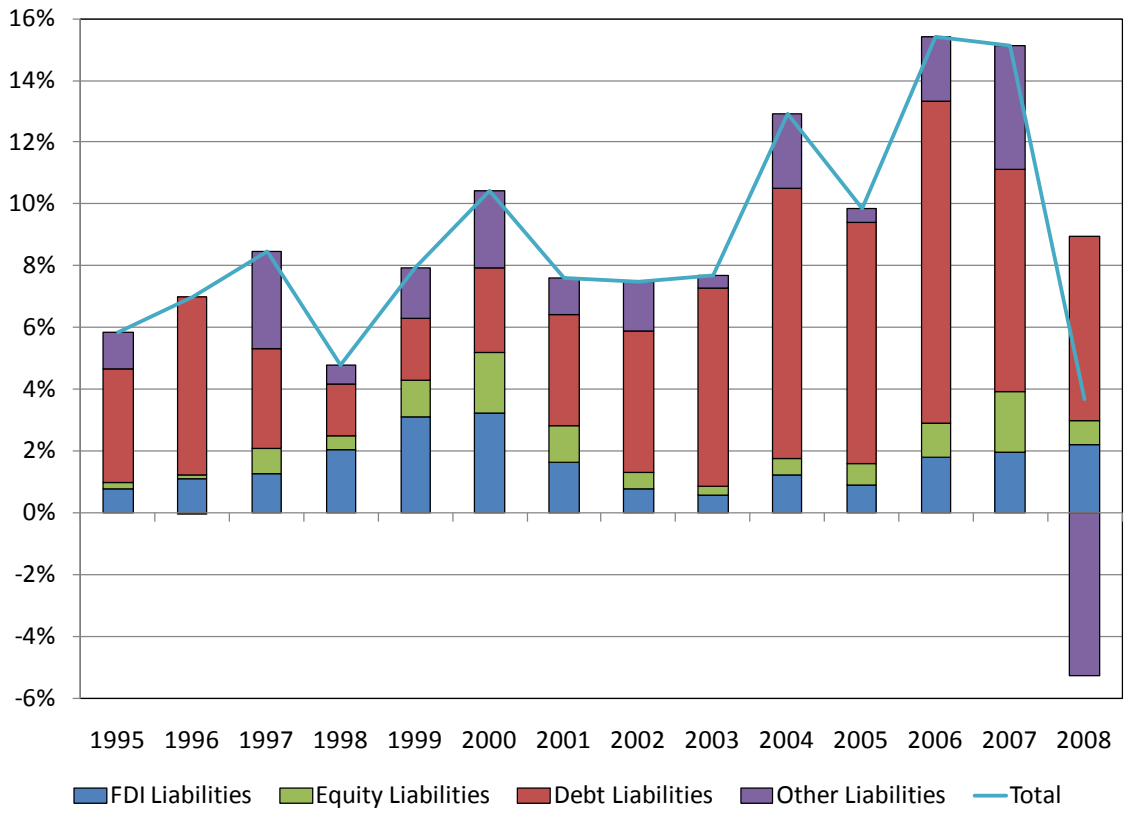

Figure 9: Composition of U.S. Gross Capital Inflows. Source: BEA. Percent of U.S. GDP

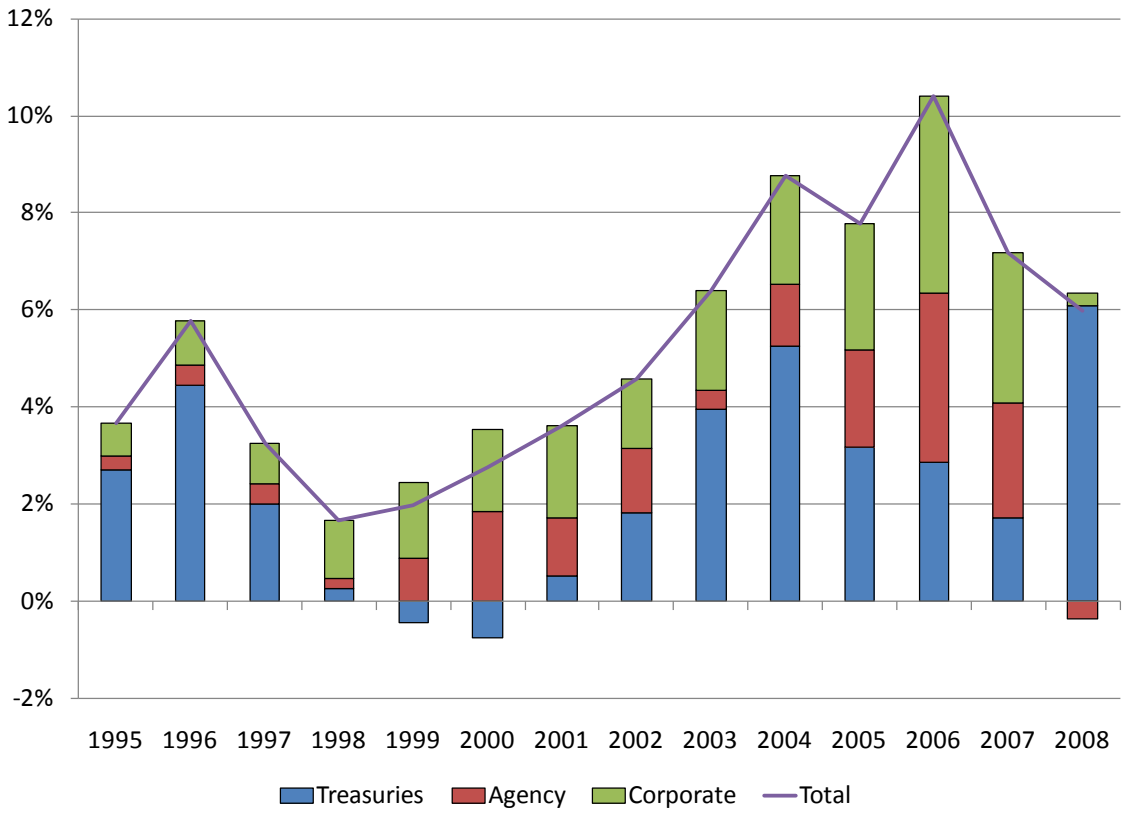

Figure 10: Decomposition of U.S. Gross Debt Inflows. Source: BEA. Percent of U.S. GDP

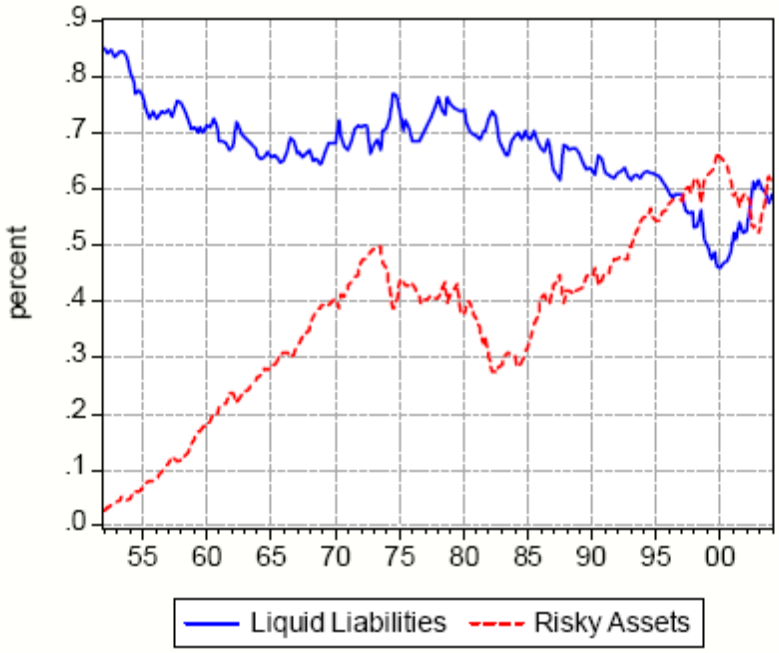

Figure 4: liquid liabilities as a fraction of total liabilities and risky assets as a fraction of total assets. Source: Gourinchas and Rey (2007)