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Capital Flows into the United States Ahead of the Great North Atlantic Financial Crisis

Brad Setser

Introduction

The crisis the United States experienced in 2008 wasn't the balance of payments crisis that many expected. It was rather a classic crisis of financial intermediation, the result of a run that took place in the shadow banking system rather than an old-fashioned run on bank deposits. Investors in the banks' short-term paper lost confidence in the value of asset-backed securities that the banks' held on their balance sheet. The crisis was not precipitated by a change in China's exchange rate management and a dollar collapse. On the contrary: China built up reserves at a record pace through the early stages of the crisis, and the loss of confidence in the shadow banking system, rather ironically, led the dollar to rally at the peak of the crisis.

Yet the U.S. balance of payments should not be written out of the story of the global financial crisis: the years immediately preceding the

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global crisis were marked by unprecedented financial inflows into the United States. Sustaining the large housing-driven U.S. external deficits took both central bank reserve accumulation and traditional financial intermediation. Central banks were willing—even too willing—to hold dollars and fund a large (over 5% of GDP) U.S. current account deficit. But they weren't willing to take credit risk. As the domestic counterpart to the U.S. external deficit shifted away from the fiscal deficits of George W. Bush's first term to excessive household borrowing, the world's largest financial intermediaries came to play a central role in the financing of both U.S. households and the U.S. trade deficit. The big banks and broker-dealers: effectively borrowed dollars from the world's central banks and invested the proceeds in risky mortgages that had been repackaged into securities that the rating agencies judged to be safe, thanks to the joys of financial engineering and some generous grading. When this private intermediation came to a stop, the private financial system lacked sufficient capital to absorb the expected credit losses on its U.S. housing exposure—triggering a violent financial crisis and a modest adjustment in the United States' current account deficit.

Back in 2009, Brender and Pisani laid out how complex chains of financial intermediation helped to finance the deficit in the U.S. household sector. Both the growth in those chains of financial intermediation and their collapse show up in the U.S. financial account. In fact, the expansion of gross financial flows from 2005 to 2007 provided a clear indicator of growing financial complexity and building risk in the system, even if the signal wasn't well understood at the time. The collapse of foreign demand for U.S. housing credit in the summer of 2007 should have been interpreted as a leading indicator that the "system" was under stress and many private intermediaries needed substantially more capital.

This paper will make five linked analytical arguments:

1. The sectoral imbalance in the United States shifted from the government sector to the household sector from 2004 to 2007, and increasingly the household sector's deficit wasn't intermediated by government-sponsored (and it turned out government backed) agencies.
2. The available supply of Treasuries failed to grow in line with the enormous increase in central bank reserves—creating a shortage

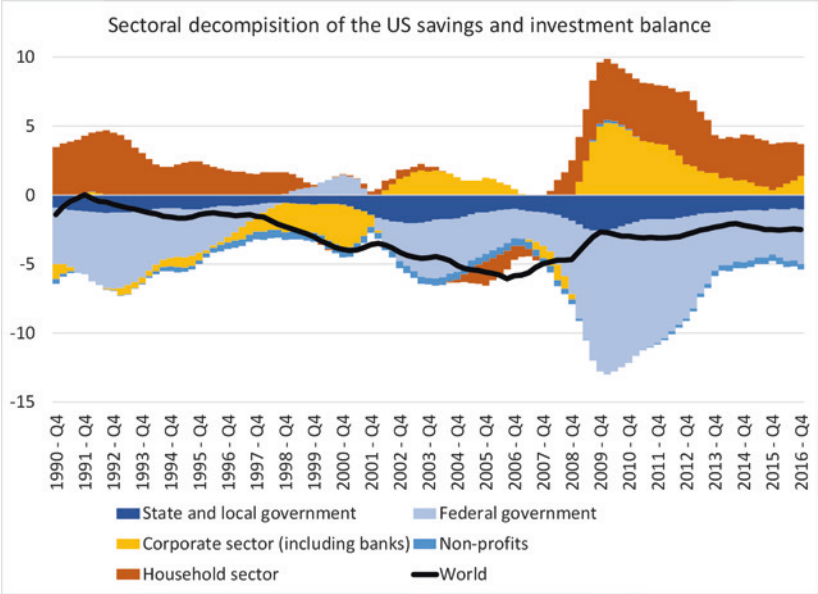
in the market that incentivized more complex forms of financial engineering.
3. After 2006, central bank flows fail to cleanly register in the U.S. data, even after taking into account the weaknesses in the U.S. data and their tendency to undercount actual central bank inflows.
4. The growth in private flows into the United States (and out of the United States) that coincided with record official reserve growth reflected the increasingly complex chains of financial intermediation needed to fund the U.S. deficit, as central banks needed to be matched to safe assets and the risk associated with privately backed U.S. mortgage pools needed to find a home. Such intermediation could have been done domestically, but many risks were warehoused offshore.
5. Some of the "missing" central bank flow—the gap between the growth in dollar reserves implied by the IMF's data and the visible inflow into Treasuries and Agencies—likely was lent to European banks, both directly and indirectly, through the cross-currency swap market. The reversal of these flows in turn explains the surge in inflows into U.S. Treasury bills that marked the crisis.

The Shifting Sectoral Imbalance in the U.S. Economy

An external deficit indicates a gap between savings and investment somewhere in the economy, whether in the corporate sector, the housing sector, or the government (Thiruvadanthai).

The sectoral source of the overall U.S. external deficit hasn't been constant. In the late 1990s, a booming corporate sector and high levels of corporate investment drove a rise in the U.S. external deficit even as the government swung into surplus. After the dot-com bubble burst, the government swung back into deficit—both for cyclical reasons and as a consequence of the 2001 and 2003 tax cuts. A fiscal deficit is a drain on national savings. Over the course of 2004 and certainly by 2005, a strengthening housing market started to propel both U.S. demand growth and raise tax revenues. The economy's borrowing need

thus shifted toward the household sector, as the overall external deficit remained large—in part because households didn't cut their overall spending as oil prices rose.



The household sector is typically a net supplier of savings to the rest of the economy, so it is extraordinary when it on aggregate moves into deficit. As important, the aggregate numbers for the household sector reflected a far bigger gross borrowing need inside the household sector: some households were borrowing large sums, while others continued to save and build up financial assets. Borrowing as a share of household's disposable income soared well above its long-term average from 2003 on as Thiruvadanthai shows in his paper on Current Account Imbalances and Debt Buildup (Thiruvadanthai 2018). Households both borrowed against rising home equity to finance current consumption (home equity lines of credit) and borrowed to buy new homes, supporting a high level of residential investment.

By 2007, the federal fiscal deficit was just over a percent of U.S. GDP, while the current account deficit remained around 5% of GDP—a shift that implied a substantial deficit in the private sector. The "twin deficit"

story was no longer substantively true; the bulk of the economy's external borrowing need came from the private sector. Such a private sector deficit could be financed either by selling safe assets to the world while U.S. financial intermediaries took on housing risk, or by directly placing the housing risk with investors from the rest of the world.

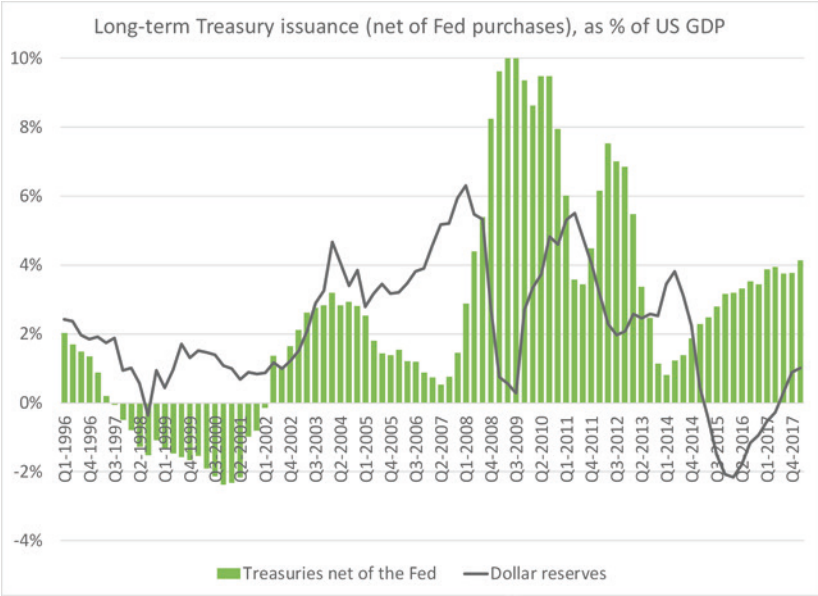
The Rise in Reserves and Thus Demand for Safe Reserve Assets

In broad terms, the shift in the sectoral composition of the U.S. savings imbalance toward households came even as external demand for U.S. financial assets shifted toward safe, government-backed bonds. In 2003, private inflows to the United States fell—putting pressure on the dollar. However, a number of key central banks, particularly in Asia, didn't want to see the value of their currencies rise against the dollar. This resulted in an enormous increase in the pace of global reserve growth.

China of course was the most important country resisting appreciation of its currency during the period. The boom in China's exports that followed its accession into the WTO created natural pressure for appreciation. But China remained reluctant to untether its currency from the dollar—in trade-weighted terms its currency actually fell in 2003 and 2004, as its tight peg to the dollar led it to follow the dollar down. It did allow the yuan to appreciate modestly against the dollar in 2005 and 2006, but the small move against the dollar at best only offset the dollar's depreciation against other currencies. Other emerging economies in Asia didn't want to lose competitiveness to an ascendant China and joined the People's Bank of China in intervention. The central banks of most of the world's commodity exporters also resisted letting their currencies appreciate along with the rising price of oil. Emerging market reserve accumulation easily topped $1 trillion by late 2007 and early 2008.

Central banks traditionally have maintained conservative financial portfolios; reserve managers generally do not have a mandate to take significant credit risk. Their natural habitat is the government bond market. In 2003 and 2004, official investors could comfortably invest their growing reserve portfolios in U.S. Treasury bonds. Net issuance of

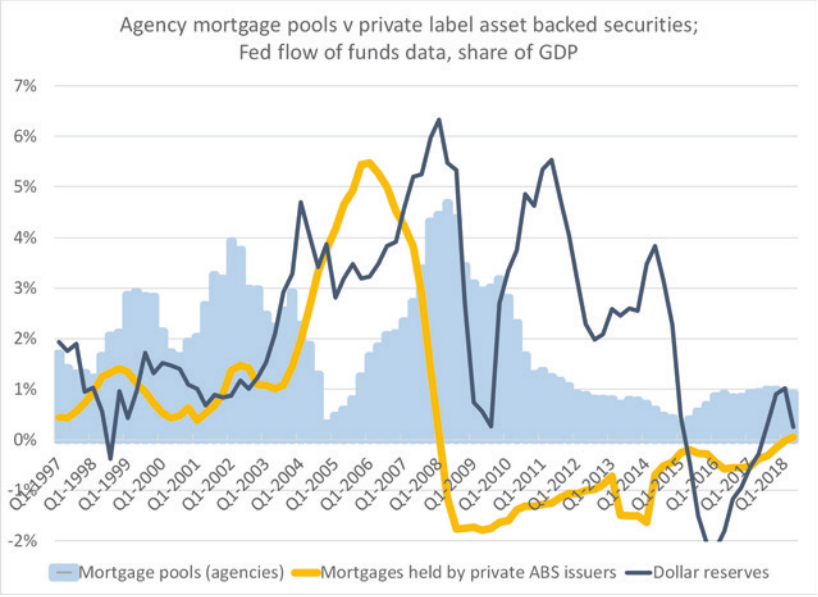
Treasuries reached a local peak at just under $400 billion in the middle of 2003, and declined only gradually in 2004.



Yet even over this period net issuance of Treasuries lagged the increase in global reserve growth. By 2003 the stock of global reserve assets—as reported by the IMF—topped the supply of U.S. Treasuries not held by the Federal Reserve. By the end of 2006, the stock of reserves was about $3 trillion larger than the stock of Treasuries in the market. Even after accounting for central banks holdings of euros and other reserve currencies, central banks' dollar holdings almost certainly exceeded the available Treasury supply. By the middle of the decade foreign holders, mostly central banks, held 65% of the available stock of marketable Treasuries.

Of course, the total stock of Treasuries, net of the holdings of the Federal Reserve, is the theoretical maximum that central banks could hold. In practice, the private sector needs to hold some Treasuries too—they are the collateral used to back a number of basic financial transactions. There is an upper limit to the number of Treasuries the world's central banks can remove from the private market.

Additional demand for safe assets could be accommodated through central bank purchases of the growing stock of bonds issued by the U.S. "Agencies." Government-sponsored entities, notably Freddie Mac and Fannie Mae (collectively known as the "Agencies"), have traditionally helped to transform U.S. housing debt into safe assets that central banks could comfortably hold on their balance sheets, as these institutions were believed to benefit from the implicit backing of the federal government. Central banks willing to give up a bit of liquidity could obtain a small increase in yield by holding the Agency bonds, without necessarily taking any direct credit risk themselves. However, by 2004 the Agencies were under political pressure to limit the growth in their balance sheet, thanks to concerns about the contingent liability they created for the U.S. government. The growth in the Agencies mortgage pools—a measure of their overall growth that captures both the mortgage-backed securities the Agencies guarantee as well as the Agencies retained portfolio—fell from an annual average of between 2 and 3% of GDP from 2001 to 2003 to under 1% of GDP in 2005.



The result was a fairly dramatic fall off in the net issuance of safe U.S. securities even as global reserve growth accelerated to record levels. To put everything starkly, in the four quarters from the middle of 2006 to the middle of 2007, the U.S. Treasury issued about $75 billion—on net—in long-term bonds. The constraints on the Agencies had been relaxed by then; they added just under $400 billion to their total mortgage pools. Yet over this period central banks added $1.1 trillion to their reserves (after adjusting for valuation changes) and liked added around $700 billion to their dollar holdings—a sum well in excess of the $450 billion in "safe" assets issued by the Treasury and the Agencies. In fact, from the start of 2005 to the end of 2007 the increase in the net supply of Treasuries and Agencies (proxied by the growth in Agency mortgage pools) lagged the increase in the world's dollar reserves.

The combination of a surge in central bank demand for safe, reserve assets amid relatively modest growth in supply had three main effects on global markets:

Central banks could buy a portion of the existing stock of government bonds from the private market—reducing the supply of Treasuries in private hands. This both freed up private funds to flow into other assets—investment funds that sold their Treasuries to a reserve manager could buy other bonds—and worked to lower the term premium on government bonds. Central bank demand for safe assets is—to a degree—price insensitive, and thus the rise in demand worked through the market in a way that was similar to the impact of the Fed's large-scale asset purchases. By making duration scarce, the term premium falls, lowering the cost of long-term funding (all else equal) throughout the economy.

Central banks could directly take more risk in an effort to get more yields or set up subsidiaries that were empowered to take more risk to try to get more return. China, for example, appears to have handed about $100 billion of its reserves over to its state banks to manage in 2006 (by swapping reserves for the banking system's yuan), and then it famously set up the China Investment Corporation in 2007 just as the market started to fall (Setser 2009a). The increase in the global reserves reported by the IMF in this period likely understates true official asset growth by over $100 billion a year from 2006 on, thinks to the large increase in China's hidden reserves between the end of 2005 and the

middle of 2008 and the substantial increase in the foreign assets of the sovereign wealth funds of many large oil-exporters.

Central banks could put dollar on deposit in the world's banks, providing the banks with dollars to lend out—or more likely, to invest in U.S. asset-backed securities. Or central banks could also engage in cross-currency swaps with the world's large banks. This would allow the reserve manager to swap dollars for say yen, which could be invested in the safe Japanese government bond market. In the swap market, holders of dollars, generally are paid a premium to swap out of dollars—the bank on the other side of the swap would pay the difference between short-term U.S. interest rates and yen interest rates plus an extra premium ("the cross-currency basis") to encourage investors to give up dollars (Concentrated Ambiguity 2018). Such swaps effectively allowed reserve managers to switch from funding the U.S. government to funding the world's banks in dollars. With a flat yield curve, the world's banks could only make money by borrowing short and lending long if they took on credit risk. Depressed term premiums (Bernanke et al. 2011) meant they could not make money by simply playing the yield curve (Setser 2009b).

Finally, central banks could truly shift away from the dollar into other reserve assets. But there were natural limits to such portfolio shifts in a world where the key central banks were managing their currencies primarily against the dollar and primarily intervening in the dollar market. Selling too many dollars for euros would put pressure on their own formal and informal currency pegs—as they would either need to follow the weakening dollar down (raising their current account surplus) or allow their currencies to appreciate (pulling in financial flows).

A Word on Data Limitations

It isn't possible, even now, to determine exactly what central banks did with their growing reserves during this period. There are too many gaps in the data.

The IMF maintains a data set on the currency composition of the world's reserve holdings. But a number of central banks considered the

currency composition of their reserves a state secret, and only reported their total reserves—not the distribution of their reserves to the IMF. Back in 2017, the IMF only had data on the currency composition of about 60% of the world's reserves, as China was reporting data on the currency composition of its reserves to the IMF. Saudi Arabia and Taiwan are also outside the scope of the IMF's detailed reporting. The "known unknown" is thus the currency composition of the reserves of those countries that didn't report full data to the IMF at this time. It is likely that the currency composition of those countries reserves was fairly close to the currency composition of those that do report, but ultimately that is just a working assumption.[1]

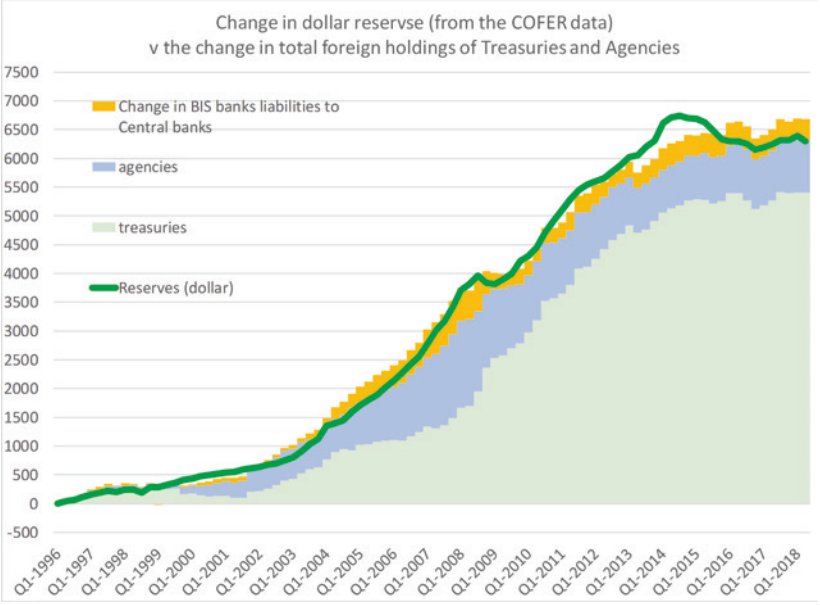
While data on the currency composition of global reserves is incomplete, there is still more data on the currency composition of global reserves than on the portfolio composition of countries' reserve portfolios: there isn't aggregated global data that would show a shift, for example, out of government bonds into equities and riskier corporate debt. Those countries report data using the SDDS format to report the overall split between deposits and bonds and other investments in their reserve portfolio, but the IMF doesn't aggregate that data. And there isn't a common global standard for reporting data about the composition of countries bond and equities portfolios. If say central banks were in aggregate shifting from holding government bonds to the bonds issued by large systemically important banks, it wouldn't show up clearly in any of the major reserves data sets.

The other main source of information on the currency composition of global reserves comes from the detailed data the U.S. reports on foreign portfolio investment in the United States. The U.S. data for the security holdings of individual countries aggregates private and official holdings. But for many surplus countries with large reserves, it provides a reasonable first approximation of the country's reserve portfolio. Official reserves tend to appear

[1]Countries that report their reserves using the IMF's SDDS template usually also report the currency composition of their reserves to the IMF, so use of the reserve template is a reasonable proxy for inclusion in the COFER data set.

in the data more cleanly than private assets, which often are held through global custodial centers. However, the U.S. survey data almost certainly undercounts central bank holdings of U.S. bonds. A central bank that uses a non-U.S. custodian for its bond holdings won't appear as a central bank in the U.S. data. Bonds held at say Belgium's Euroclear will appear as private Belgian holdings. Reserves that a central bank hands over to a private fund manager to manage also, reasonably, appear as private in the U.S. data. Finally, if a central bank swaps dollars with a private counterparty in order to pick up the cross-currency basis (basically a fee for lending out its dollars) and the private counterparty then buys a U.S. bond, that too appears as a private holding in the U.S. data.

In practice, estimates of global dollar reserve growth tend to match total inflows in Treasuries and Agencies more closely than they match the reported "official" central bank inflows in the U.S. data.



The numbers on official inflows are derived from the change in the stock of central bank holdings reported in the survey data, but this still only captures the funds central banks hold directly with U.S. custodians. The close overall correlation between estimated dollar reserves and overall foreign holdings of Treasuries and Agencies suggests that relatively few central banks made risky investments themselves, even back in the pre-crisis days when Treasury supply was constrained. Ultimately though this is a judgment based on a close read of the data, not a fact that falls directly out of disclosed holdings. The gaps in the data are too large to know for sure.

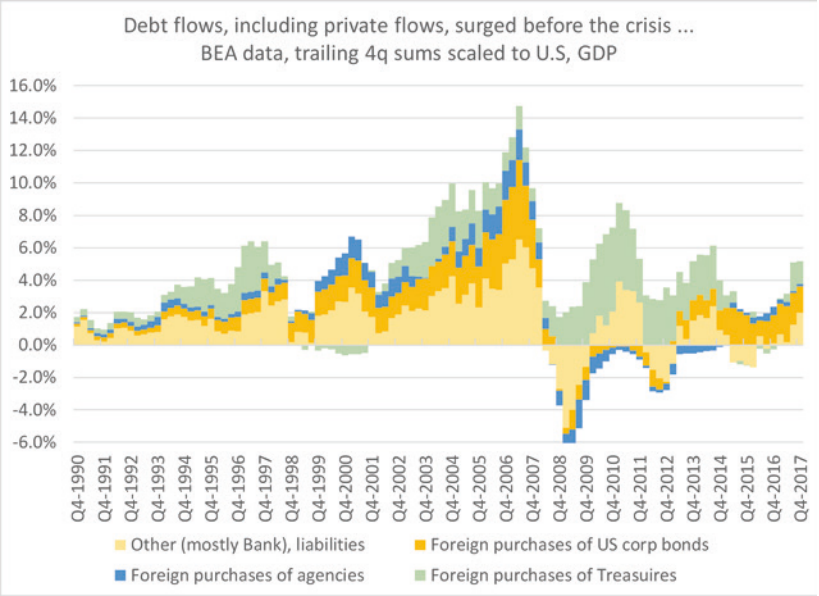
The Surge in Private Inflows and Outflows That Preceded the Global Crisis

There is a deep puzzle in the U.S. financial account data for the period preceding the global crisis.

Between 2005 and 2008, central bank reserve accumulation soared to record levels. A look at the balance of payments of the main surplus countries indicates that the bulk of the financial outflow from these countries—the counterpart to their trade surplus—came from the buildup of central bank and sovereign wealth fund assets. On net, private funds were actually flowing into the main surplus countries at this time, as reserve growth exceeded these countries' current account surplus. There is also good reason to believe that unprecedented growth in total reserves led to unprecedented growth in dollar reserves (Setser 2009a). The main known unknown during this period is what China was doing with its huge portfolio, and there haven't been any major changes in the aggregate currency composition of global reserves as China's reserves were integrated into the global data from 2015 on.

Yet this is also a period when private financial inflows to the United States—judging from the U.S. data soared. In 2007, total gross inflows—including official inflows into Treasuries and Agencies, as well as private inflows into corporate bonds and cross-border bank

lending—reached 14% of U.S. GDP, a record. Those inflows far exceeded current account deficit, which never topped 6% of U.S. GDP. They also are far larger than can be explained by reserve growth alone.



At the time, large gross inflows were seen as a sign that globalization had strengthened the stability of the United States and the global financial system: financial globalization had reduced the risk associated with the United States' persistent, large external deficits, as the risk associated with the U.S. housing boom was being dispersed globally, rather than retained in the "core" of the U.S. financial system. The IMF, reflecting the conventional wisdom of the Federal Reserve and U.S. authorities at the time, wrote in its 2007 assessment of the U.S. economy (emphasis added):

> Innovation based on an "originate to distribute" model is reshaping the financial sector…the income of institutions at the core of the financial system, the commercial and investment banks, increasingly derives from bundling and servicing securitized assets for investors—asset-backed securities and collateralized debt/loan obligations (CDOs/CLOs)—rather

> than from holding loans. The system has thus evolved to yield: (i) ***a profitable and well-capitalized core relatively protected from credit risks***; (ii) an innovative and lightly regulated periphery, including specialized institutions that originate loans and a multitude of hedge funds that support market liquidity and price discovery; and (iii) the transfer and diversification of credit risk via a wider range of securitized assets and credit derivatives. Against this rapidly changing financing landscape, ***U.S. markets have remained globally pre-eminent and robust to a range of shocks.***

Later in the report, the Fund wrote:

> Core commercial and investment banks are in a sound financial position, and systemic risks appear low. (IMF 2017)

Large private inflows during this period were interpreted as evidence that the distortions associated with the buildup in official assets were limited—reserve growth was large, to be sure, but official flows only accounted for a portion of the total inflow into the U.S. financial markets (Greenspan 2007). Most financial intermediation was occurring privately.

The reality, though, was less benign. The large gross financial inflows into the U.S. at this time reflected the development of complex chains of financial intermediation, and thus were a sign of growing risk inside the financial system.

With hindsight it appears likely that the rise in gross flows was directly tied to the fact that central bank dollar reserves couldn't simply flow into the U.S. Treasury market and finance both the U.S. fiscal and external deficit. Private financial intermediaries had to match central banks desire for safety with the actual financial assets the U.S. economy was generating at the time.

Consider three examples of more complex chains of financial intermediation identified.

One: Central banks put dollars on deposit offshore in a European bank, which then buys "private label" U.S. asset-backed securities. This of course would show up as a private foreign purchase of U.S. corporate debt.

Two: A central bank buys a two-year U.S. Treasury bond from a corporate treasurer, which then invests in a money market fund.

The money market fund in turn buys the commercial paper issued by a European bank, or a special investment vehicle domiciled offshore. And the offshore vehicle buys private label asset-backed securities. This would show up as an official inflow into the U.S. Treasury market, a private outflow into foreign short-term securities (the U.S. money market fund buying commercial paper), and private foreign inflow into long-term U.S. corporate bonds.

Three: A central bank engages in a cross-currency swap with a European bank, swapping dollars for euro. The central bank can then invest in a European government bond, while being hedged against exchange rate risk (it effectively is still holding dollars). And the European bank can invest, making a real-estate-backed loan or buying an asset-backed security. It could of course also have bought a "safe" U.S. asset, but the flat yield curve made such straight-forward maturity transformation unprofitable. This shows up in the global data as a central bank purchase of European debt, and a private foreign purchase of U.S. corporate bonds—the fact that the private investor and the central bank have swapped the currency component of their respective returns is largely invisible.

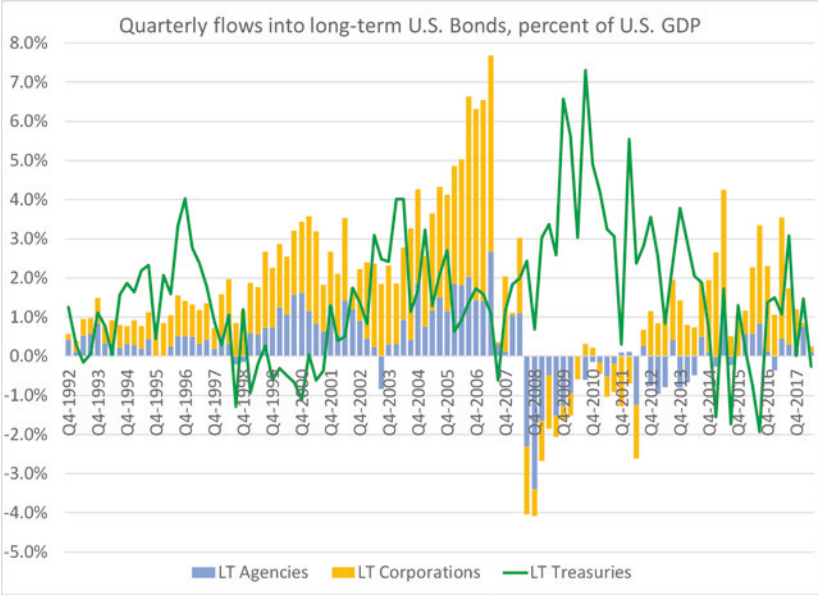
All these more complex chains of financial intermediation, in different ways, left traces in the U.S. balance of payments. All result in a rise in apparent private inflows to the United States at a time of record global dollar reserve accumulation. All in effect, combine private risk capital with dollars borrowed from the world's central banks to support a portfolio composed of private U.S. bonds (Brender and Pisani).

They thus map to the surge in foreign purchases of private label U.S. asset-backed securities from 2005 to the middle of 2007—back at a time when over 15% of all U.S. mortgages were subprime and thus not eligible for repackaging into a traditional agency security.

These complex chains of financial intermediation collapsed in the crisis (Brender and Pisani 2009).

In fact, several started to unravel well before the peak of the crisis in the fall of 2008.

The first real sign of global financial distress came in the summer of 2007, when the investment vehicles of a couple of European banks ran into trouble. Over the course of that summer, foreign purchases of U.S. corporate bonds—the balance of payments category that includes asset-backed securities—more or less came to a complete halt.



Cross-border bank flows (a category that includes many of the activities of money market funds as well as direct bank flows) also slowed in late 2007, and then fully reversed during the crisis. This category is a difficult one to track in the balance of payments data, as there is a strong correlation between bank inflows and bank outflows, so the net flow is typically only a fraction of the gross flow. Nonetheless, the rise in gross bank flows from 2005 to 2007—which shows up clearly in a chart of cumulative flows—provided a leading indicator of growing financial complexity and rising leverage. The pro-cycle process identified by Adrian and Shin (Adrian and Shin 2010) left a clear mark in the balance of payments data.

Global reserve growth remained strong—in part because the dollar remained relatively weak—even after the fall in private demand for U.S. asset-backed securities in the summer of 2007. At this time, the Federal Reserve was cutting rates to support a weakening U.S. economy, leading the dollar to fall against the euro—while many emerging markets still refused to allow their currencies to float freely against the dollar. Global reserve growth reached its all-time peak in the four quarters that ended in the middle of 2008.

Over this period, the "Agencies" significantly increased their issuance. They remained under private ownership, but they were effectively providing policy support to the U.S. housing market. Increased Agency issuance in turn also helped to meet a portion of the rise in global demand for reserve assets during this period, as foreign demand for Agencies continued—albeit at a more modest pace than in early 2007—through the summer of 2008. But these inflows hinged on the credibility of the U.S. government's backstop for the Agencies, not on a judgment that the Agencies had only backed solid mortgages or that the Agencies had enough capital of their own to provide foreign investors holding Agency bonds with protection against a deteriorating U.S. housing market. When foreign investors—notably China, which had been a huge purchaser of Agency mortgage-backed securities—and Russia—which held the bulk of its growing reserves in the short-term securities the Agencies issued directly—lost confidence in the federal backstop in the third quarter of 2008, foreign demand for Agencies truly came to a sudden halt.

By the fall of 2008, losses on private label mortgage securities and fears of future losses paralyzed the private financial system. Lenders to the world's banks realized, too late, that the world's big banks lacked sufficient buffers of capital to clearly be able to absorb the potential losses on their suddenly illiquid private label asset-backed security holdings.

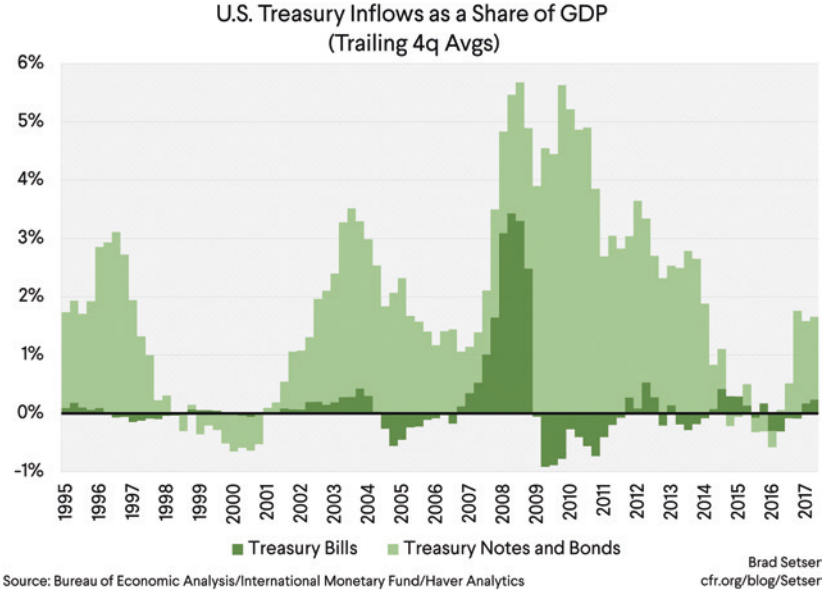
The dollar's rally after Lehman's bankruptcy has attracted a great deal of attention, as it created the perception that foreign demand for U.S. financial assets rose in the midst of the U.S. financial crisis. The reality is more complicated. Private inflows into risky U.S. financial assets fell, as one would expect. In fact, private flows into U.S. bonds actually reversed—foreigners were net sellers of U.S. corporate debt in 2008 and 2009 and net sellers of Agencies from mid-2008 onwards. Foreign banks also reduced their lending to the United States. The inflow into the U.S. market came because U.S. banks—and other American short-term lenders—reversed their global lending and brought their funds home. This repatriation, rather than a rise in private foreign demand for U.S. financial assets, accounts for the relative stability of the U.S. balance of payments amid the crisis.

If this repatriation is excluded, the magnitude of the swing in foreign demand for U.S. corporate bonds and foreign bank lending to the

United States would be in line with the kind of swings experienced by emerging markets during a "sudden stop." Total inflows into U.S. debt, including bank flows, from abroad fell from a peak of 14% of U.S. GDP in 2007 to through of negative 6% in early 2009, a swing of close to 20% of U.S. GDP.

After Three Sudden Stops, a Surge: The Crisis Driven Inflow into U.S. Treasuries

There of course was one final, and important flow in the crisis—a surge in foreign demand for Treasury bills. This apparent inflow helped to offset the reversal of private inflows into long-term bonds. Much of the rise in demand for Treasury bills clearly came from official sources: China's holding of short-term bills rose from close to zero to $200 billion; total central bank holdings of bills rose by $350 billion in the second half of 2008 and the first quarter of 2009. Central banks thus account for well over half of the total inflow into bills at the height of the crisis.

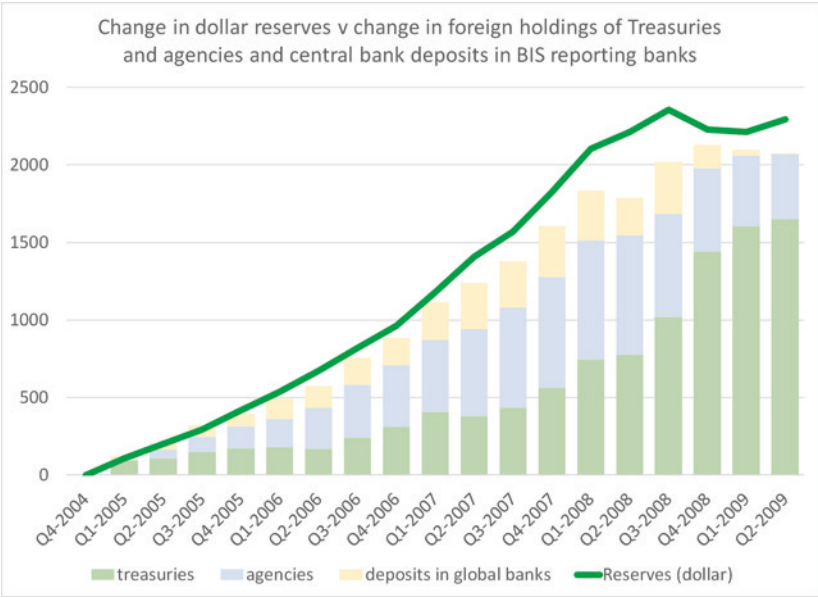


Lehman wasn't just a shock to the U.S. financial account—it was a shock to the entire global financial system. Banks pulled back globally, putting pressure on most emerging economies. The crisis thus triggered a very sharp swing in reserve growth. Reserves actually increased by about $300 billion in q3 2008 (an annual pace of $1.2 trillion). In the fourth quarter, central banks reduced their reserves by $100 billion (annual pace of negative $400b). The net central bank inflows into Treasury bills in the fourth quarter ($200 billion) and the first quarter of 2009 ($80 billion) thus cannot be explained by a rise in global reserve holdings. Central banks were selling reserves and dollars at the same time when they were shifting funds into Treasuries.

It consequently is clear that the flow into Treasuries primarily reflects a shift in central banks' portfolios toward safety rather than a surge in demand for U.S. financial assets. The flow into Treasuries came as central banks moved out of the Agency market—there were $175 billion in foreign central bank sales of Agencies in the fourth quarter of 2008 alone. The BIS data also shows an almost $200 billion fall in central bank dollar deposits in global banks in q4 2008, and another fall of $100 billion in q1 2009. The big inflow into Treasuries attracted a lot of attention, as it was very visible. But there were equally large outflows from other dollar assets, which were no longer considered safe.

Reserve managers broadly speaking acted like everyone else: they sought safety in the crisis. In fact, the surge in demand for Treasuries helps clarify one of the great mysteries in the pre-crisis balance of payments. From the end of 2005 to the middle of 2008, only about a third of estimated dollar reserve growth flowed into Treasuries and only about two-thirds flowed into Treasuries and Agencies. One-third didn't appear in the U.S. securities data. The bulk of these missing reserves likely had been lent to the global banks either directly, as deposits, or indirectly, through cross-currency swaps.

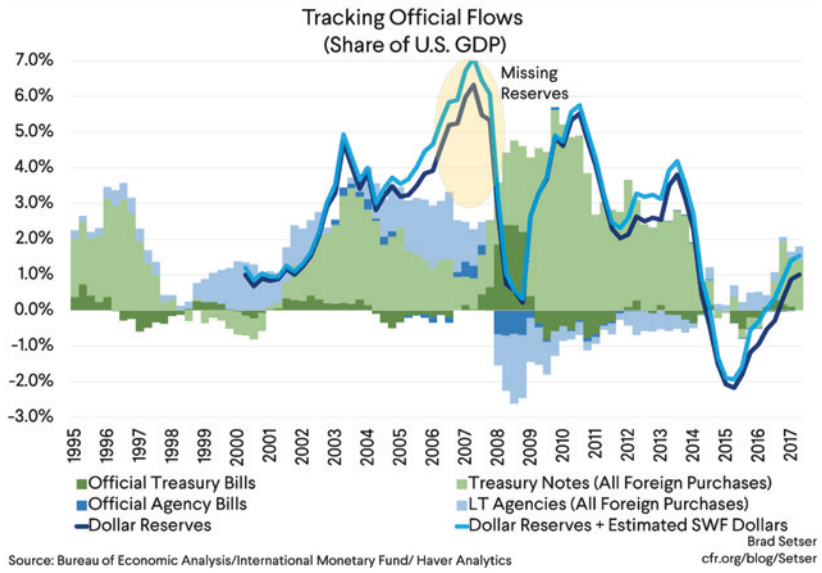
By the middle of 2009 that gap has largely disappeared, as the reserves that had flowed into dollar assets other than Treasuries before the crisis flowed back into Treasuries during the crisis. Between the middle of 2008 and the middle of 2009 foreign holdings of Treasuries rose by a remarkable $900 billion while global reserves were essentially flat.



The surge in demand for U.S. Treasuries in the crisis helped hold down U.S. rates even as the U.S. increased issuance. But the importance of this "stabilizing" flow shouldn't be overstated, as the flow into Treasuries was the counterpart of instability in the market for Agencies and the broader global market for dollar funding. It took a series of dramatic actions by the U.S. government, in conjunction with the Treasuries and central banks of key European states, to stabilize the global financial system through a combination of equity injections and liquidity support. Foreign central banks, reasonably, sought safety in the crisis, even if that added to the risk of global instability—they didn't act differently than private investors.

After the violent swings of the crisis years, the United States settled into a "new normal" from 2009 onwards. The U.S. financial account in the years immediately after the global crisis actually looked a bit like the financial account back in 2003. Strong global reserve growth translated directly onto strong foreign demand for U.S. Treasuries. There was

very little foreign demand for any other types of U.S. bonds, and with no shortage of Treasury issuance, there was no need for complex chains of financial intermediation. These intervention and reserve driven flows continued, with a brief interruption at the peak of the Euro Area's crisis, until the dollar rallied on the back of monetary policy divergences between the G-3 economies in the summer of 2014.



Without the need for complex chains of financial intermediation, gross financial inflows and outflows into the United States fell significantly. The sharp increase in gross flows during the period from 2004 to 2008 now looks like a blip rather than the irrevocable march of financial globalization and the start of a permanent decoupling of national savings from national investment.

Conclusion

The U.S. crisis manifested itself as an old-fashioned run in the modern securities market—large pools of wholesale dollar funding no longer believed that the global banks and large broker dealers were safe, and no longer wanted to give the banks any funds to intermediate. The government had to step in—and eventually did, on an unprecedented scale.

Yet even if the crisis didn't follow the classic contours of a balance of payments crisis, the buildup of vulnerabilities that gave rise to the crisis left large traces in the balance of payments data. The rise in gross inflows and outflows from the U.S. indicated rising financial leverage, as in some sense the global financial system sought to find a home for the private housing risk that the United States' main external funders—the world's central banks—didn't want to take. Gross debt inflows into the U.S. peaked at an incredible 15% of U.S. GDP in the middle of 2007. They subsequently have fallen back to a healthier 5% of U.S. GDP.

There was a clue in this rise, one that unfortunately wasn't well understood in real time. Rather than a sign of healthy globalization, the rise in cross-border flows—both absolutely, and relative to the U.S. current account deficit—was a sign of building systemic risk.

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