

# The Making of America's Imbalances\*

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## Abstract

This paper tracks the history of sectoral saving and borrowing in the US economy over the past 50 years. We show that the financial imbalances that erupted in the financial crisis of 2008 were long in the making and preceded the emergence of global imbalances in the 2000s. These new dynamics in the household sector were already apparent in the 1990s, long before the deterioration in the US government balance or the current account balance and long before the arrival on the international stage of Chinese reserve accumulation. The record low household savings rate in the past decade was the product of two separate trends: a sharp fall in the asset acquisition of American households in the 1990s, and an explosion of mortgage borrowing in the 2000s. The American credit boom of the 2000s had few direct links to reserve accumulation in emerging markets. The mortgage boom was financed by the US financial sector which intermediated foreign funds from *private* sources.

Keywords: savings rate, flow of funds, wealth effects, financial instability, global imbalances, current account deficit.

JEL classification: E21, E22, F32, N10, N12

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## 1. INTRODUCTION

Discussions of the international economy and the global financial crisis give enormous emphasis to current account imbalances. Global imbalances such as those between the US and China or Germany and the rest of the EU are the object of much debate. Many central bankers, in particular, have embraced a reading of the global financial crisis in which imbalances and the surge in uphill net capital flows from poor to rich countries play a dominant role. In this view, a large and sudden rise of desired savings from developing countries, a savings glut (Bernanke 2005), flooded the US economy. Such explanations attribute a good part of the imbalance to events that took place outside the US and other developed countries. Yet the role of foreign capital in the US credit boom remains an area of much debate. What were the exact channels through which the reserve hunger of emerging markets fueled the housing boom in America? How did savings and investment patterns in the U.S. economy change with the influx of foreign savings?

It is widely understood that at the international level, one country's current account deficit is another country's surplus. Therefore, for example, a change in the American current account deficit will be matched by changes elsewhere. At the national level too, a change in the current account deficit, a nation's net financial investment with the rest of the world, will be reflected in adjustments to saving by one or more sectors of the domestic economy. Since the net financial investment of all sectors (including the financial and the foreign sectors) must sum to zero, changes in one sector must lead to changes elsewhere in the economy. We can therefore study the evolution of global imbalances through the lens of sectoral financial balances in the US economy. This provides us with a new and potentially more informative perspective on the role of global and domestic factors in the making of America's financial imbalances.

Our financial balances based approach meshes with other contributions arguing that for a better understanding of global imbalances, we have to look beyond the study of net flows of capital (as measured in the current account and implicit in the savings glut hypothesis) and focus on the underlying gross flows of capital (Borio and Disyatat 2011; Shin 2011). In today's world economy, net flows of capital are dwarfed by the underlying

gross inflows and outflows of capital.<sup>1</sup> In the US case, gross inflows of capital in 2007 were approximately \$2.1 trillion while gross outflows of capital reached \$1.4 trillion. This resulted in a net inflow of foreign capital (equal to the current account deficit) of \$710 billion. Moreover, the gross financing flows do not have to align with trade flows. For instance, European savers can finance American deficits vis-à-vis Asia despite a balanced trade account between Europe and the U.S. Authors such as Obstfeld (2012) as well as Lane and McQuade (2013) have accordingly questioned the usefulness of the current account for an understanding the causes of the 2008 crisis and the drivers of financial fragility more generally. Jorda, Schularick and Taylor (2011) have shown that in advanced economies, current account imbalances are not a particularly reliable warning signal for financial crises, but credit growth is.

The present paper extends this focus on gross savings flows to a sectoral study of the US economy over the past 50 years. Our goal is to delve deeper than the usual generalizations about the decline in savings rates and the increase in foreign borrowing in an effort to understand the causes and consequences of the American role in the global imbalances debate. We will show that the relationships are more nuanced than the twin deficit terminology introduced in the 1980s when the US first encountered large current account and government deficits. Our data for the household, non-financial business and government sectors show substantial shifts in the financing patterns within the US economy that could have been interpreted as an early warning sign for financial stability risks (Eichner, Kohn and Palumbo 2010).

Specifically, we show that the America's imbalances were long in the making. Long-standing patterns of inter-sectoral financial flows have dissolved in the past two decades. New dynamics in the household sector were apparent in the 1990s, before the deterioration in the US government balance or the current account balance and long before the arrival on the international stage of Chinese reserve accumulation. From this perspective, the decade of the 1990s – when rising equity wealth led to a sharp drop in active savings – was as crucial for the making of American imbalances as the 2000s

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<sup>1</sup> In the first globalization, before 1914, gross flows corresponded much more closely to net flows of capital; see Obstfeld and Taylor (2004) and Schularick (2006).

when household borrowing accelerated sharply against the background of much reduced active savings. Our key results can be summarized as follows.

First, the deterioration of the US current account was mainly driven by the worsening financial balance of the household sector and temporary swings in the federal budget deficit. The business sector was, largely, a passive bystander that did not borrow meaningfully from other sectors. Unlike most textbook models suggest, the American business sector is largely self-financing and does not depend on (net) intermediation of savings from other sectors. The substantial worsening of the household financial position got underway in the mid-1990s when households' acquisition of financial assets fell dramatically. It deteriorated further in subsequent years when the unprecedented growth of mortgage borrowing occurred at a time of much reduced active savings by households. When record low active savings met the housing credit boom of the 2000s, the overall financial balance of the U.S. economy went deep into the red.

Second, the foreign sector played an increasingly large role in recent decades as global financial integration proceeded at a rapid pace. Two sources of foreign capital inflows have been dominant: official inflows, reserve accumulation, into government securities, and private inflows into fixed income securities issued predominantly by U.S. financial companies. Foreign direct and equity investments play no important part in the overall picture.

Lastly, the American credit bubble of the 2000s was financed by private capital. On a flow basis, reserve accumulation by foreign governments played virtually no direct role in the financing of the American credit bubble of the 2000s. The U.S. financial sector provided the financing for mortgage-hungry country. Wall Street fed the credit hunger of the American economy by borrowing from other households and by issuing debt liabilities in international financial markets; but it was the foreign private sector, not foreign governments, that provided most of the fuel for the fire. Chinese purchases of Treasury securities helped fund the war in Iraq at low cost, but the domestic credit boom was a story that was homemade, albeit with some support from (mainly) European creditors to American financial institutions. Our results here stand in clear opposition to arguments that link the bubble in US housing markets in the 2000s with the global glut of savings (Bernanke 2005), at least as far as the direction of capital flows is concerned.

Our paper does not aim to speak to the debate about the causes and consequences of global imbalances that has blossomed in recent years (Mendoza et al. 2009; Caballero et al. 2008; Carroll and Jeanne 2008). Nor are we interested in the question whether America's current account deficit is of the "good" or "bad" variety. Blanchard and Milesi-Ferretti (2011) discuss deficits that arise for "good reasons" such as a promising economic outlook or high investment and those that have "bad" origins such as financial distortions, incomplete markets or misguided policies regarding national savings. The goal of this article is to shed new light on the financial flows underlying America's imbalances and track their development over half a century of economic history.

The structure of this paper is as follows. In the next section, we describe our data sources: the recently revised National Income and Product Accounts (NIPA) and the financial flows from the Flow of Funds (FoF) accounts. In section 3, we trace the evolution of sectoral savings and investment balances over the past 50 years. In the following section, we go beyond changes in net financial balances and look at the underlying financial flows. In section five, we complement our treatment of 50 years of U.S. macroeconomic history by examining the development of sectoral debt and net worth. The last section presents some concluding thoughts.

## **2. DATA**

There are two largely independent sources of data on savings and investment in the US: the National Income and Product Accounts (NIPA) and the Flow of Funds Accounts (FoF). NIPA takes the familiar income accounting approach that defines savings as the difference between income and expenditure. The flow of funds approach measures saving from financial flows. In the FoF accounts, saving is net financial investment or the difference between the net acquisition of financial assets and the net increase in liabilities. Conceptually, net financial investment plus net investment in physical assets are the same as saving from NIPA. After correcting for some differences in definitions and accounting treatment, the two measures should be identical although difficulties in measurement result in sometimes large discrepancies. Both NIPA

and FoF provide information for saving in the major sectors of the economy: households, government, business and the rest of the world (foreign sector) although FoF has greater sectoral detail, particularly for the financial sector.

The NIPA are more commonly used and most readers will be familiar with the overall structure of the accounts. However, our examination of sector by sector savings balances motivates our interest in specific financial flows in order to understand changes in the overall aggregates. For example, NIPA tells us nothing about the increase in leverage in the business sector and the increasing role of mortgage financing. For such information we turn to the FoF which provides considerable detail about the financial flows by type of asset as well as information on asset balances (stocks).

The NIPA follows the same national accounting structure used around the world. FoF accounting structures are less common in other countries and less familiar to economists in the US although the Federal Reserve has published FoF accounts for over 50 years. In 1993, the statistical groups at several international financial institutions recommended a framework for national accounts that includes both financial and real data. The US introduced its integrated macroeconomic accounts in 2006 (Bond et. al 2007) which draws on data from both NIPA and FoF. Our data are taken from the original sources, which include more detail; the specific web references are found in an appendix detailing the data sources and vintages used.

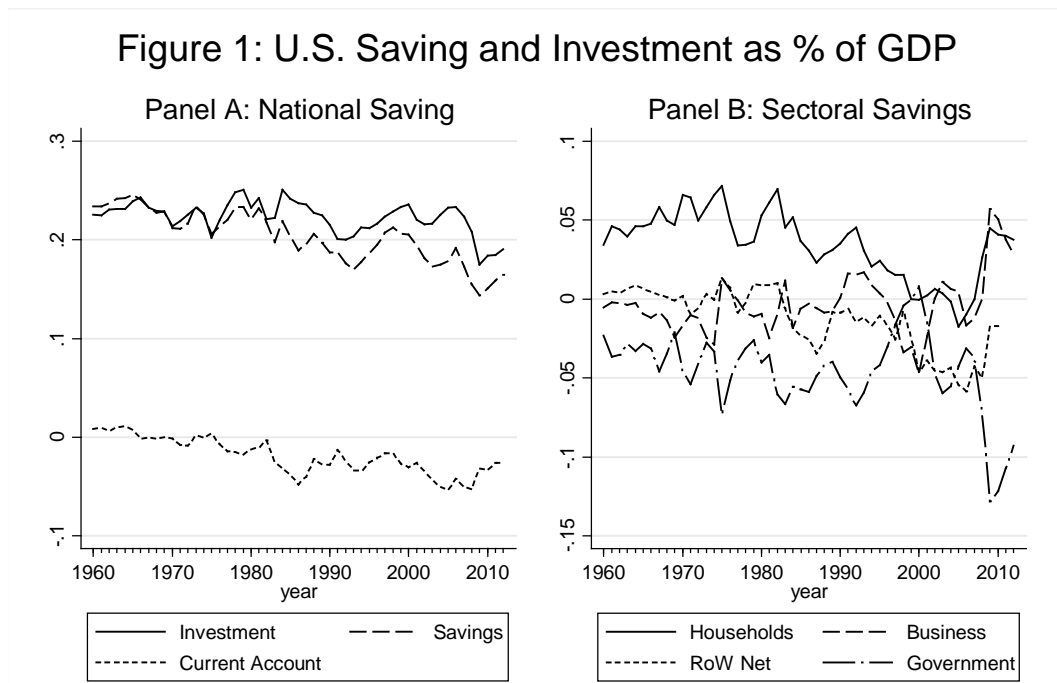
### **3. THE EVOLUTION OF SECTORAL SAVINGS AND INVESTMENT BALANCES, 1960-2010**

Discussion of global imbalances usually starts with the observation that the current account balance (CA) is simply the difference between national savings (S) and gross domestic investment (I):  $CA = S - I$ . Panel A of Figure 1 shows the decline of national savings as a percent of GDP in the US and, given a broadly stable investment rate, the concomitant widening of the current account deficit that takes center stage in the debate about the causes of the financial crises and the imbalances in the world economy.

There is another way of looking at the current account balance (Wachtel, 1991); it is also the (negative of) net financial investment of the rest of the world in the US, one of

several sectoral financial balances. That is, the net financial investment of each domestic sector is the difference between its saving and investment:  $NFI^i = S^i - I^i$  where the sectors,  $i$ , are non-financial business, households, finance and government. Further, the sum of all the sectoral imbalances, the net financial investment of the domestic sectors and the rest of the world is zero:  $CA + \sum_i NFI^i = 0$ . Thus, for a full view of the evolution of savings and investment imbalances we look at the net financial investment of each sector as shown in Panel B of Figure 1. Although the variability of the sectoral balances makes it difficult to discern the trends, a few structural development show through. Changes in the imbalances of the household sector are as important as the government and foreign sector deficits.

Figure 1



Note: Panel A shows gross domestic investment, national savings and the current account balance from the NIPA. Panel B shows the net financial investment of each sector.

The big picture story is that, with the partial exception of the business sector, the sectors of the US economy have witnessed marked changes in their savings and investment balances during the past 50 years. Household saving peaked in the early 1980s. After brief surpluses during the late years of the Clinton administration, the

government sector financial balance turned negative in the 2000s. The business sector was not an important net borrower over the past 50 years and typically ran savings-investment balances of less than 1% of GDP. In the 2000s in the years before the financial crisis, all domestic sectors of the US economy were in deficit. Only the foreign sector supplied funds to the US economy on a net basis.

Table 1 summarizes the history of sectoral balances using data from the recently revised NIPA accounts for each of the past five decades.<sup>2</sup> In the 1960s, American business investment exceeded the savings of the same sector by a relatively small amount, equivalent to about 0.8% of GDP. The average annual borrowing requirement by the government was about 3% of GDP and the foreign balance was close to zero. The main provider of (net) savings to the other sectors and here mainly to the government was the household sector. American families' savings exceeded their investment into housing and other durables by 4.6% of GDP. The savings surplus of the household sector grew in the 1970s to 5.3%, compensating for a worsening of the government balance.

Both the business sector and the foreign sector saw very little changes in this decade. Gross investment (capital expenditure) rates have stayed constant over the past 30 years, but net investment has fallen slightly relative to GDP, mainly owing to higher depreciation charges. Business investment today has a larger share of computers, vehicles and other short-lived capital goods than it did during the era of large-scale industrial plants. With higher depreciation charges, more investment is financed internally and there is less need to borrow.

In the 1980s, the decline of the household sectoral balance commenced. A process began that has become a key feature of America's imbalances: a continuous decline of the household balance from 5% in the 1970s to 4% in the 1980s, 2.5% in the 1990s and essentially zero in the 2000s. Neither the business balance nor the government balance moved much on average. The mirror image of the decline in the household balance was the widening deficit with the rest of the world. American households ceased to be the main provider of savings to the other sectors of the US economy, and the foreign sector assumed that role.

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<sup>2</sup> The figures in the tables only run to 2008 as we want track the development of imbalances in the run-up to the crisis, not the post-crisis adjustment.



Table 1: Sectoral Balances, ratio to GDP: 1960-2008 (NIPA data)

	Business	Household	Government	Rest of World
1960s	-0.008	0.046	-0.032	0.006
1970s	-0.009	0.053	-0.042	0.001
1980s	-0.008	0.043	-0.050	-0.016
1990s	-0.002	0.025	-0.037	-0.014
2000s	-0.009	0.001	-0.039	-0.047

Note: The table shows the net financial investment for each sector from the NIPA. Data are arithmetic averages of annual ratios by decade: 1960-69, 1970-79,..., 2000-08.

#### **4. GROSS SECTORAL LENDING AND BORROWING: THE VIEW FROM THE FLOW OF FUNDS ACCOUNTS**

While sectoral savings and investment imbalances illuminate the big changes in savings and investment behavior individual of individual sectors, one has to go a step further and zoom in on the underlying gross flows of financial funds to understand the driving forces of the process. In the following, we will turn to the Flow of Funds accounts that provide details about the gross acquisition of financial assets (lending) and the incurrence of financial liabilities (borrowing) which correspond to the sectoral imbalances between savings and investment. The reason behind this is simple. Whenever a sector invests more than it saves, it must borrow funds from other sectors. If one adds up all financial transactions (borrowing and lending) between, say, the household sector and all other sectors, the resulting sum of net financial investment of the household sector should be identical to the savings and investment balance discussed in the previous section. As mentioned above, this financial balances based approach, focusing on the underlying gross lending and borrowing decisions, meshes well with other recent contributions arguing that gross flows of capital contain valuable information about the build-up of financial fragility (Borio and Disyatat 2011; Shin 2011).

Table 2 summarizes the key trends using the flow of funds data. There are some small differences to the savings-investment balances from NIPA discussed above, but the

overall picture is similar. Net financial investment of the household sector fell strongly and was mirrored almost one for one by a rise in the net financial investment of the foreign sector. Both the government and the business sector exhibit no similarly clear trend. In the following, we will examine each domestic sector individually, tracing the evolution of the composition of American sectoral balances in the last five decades.

Table 2: Sectoral Balances, ratio to GDP, 1960-2008 (FoF data)

	1960s	1970s	1980s	1990s	2000s
Households	0.037	0.048	0.053	0.021	-0.017
Assets	0.073	0.096	0.104	0.065	0.053
Liabilities	0.036	0.048	0.051	0.044	0.070
Business sector	-0.027	-0.037	-0.030	-0.002	-0.013
Assets	0.025	0.049	0.054	0.056	0.065
Liabilities	0.052	0.086	0.084	0.058	0.078
Foreign sector	-0.004	-0.001	0.012	0.015	0.049
Assets	0.007	0.016	0.025	0.048	0.089
Liabilities	0.011	0.017	0.014	0.033	0.040
Government sector	-0.011	-0.020	-0.045	-0.025	-0.027
Assets	0.011	0.018	0.020	0.008	0.014
Liabilities	0.021	0.039	0.065	0.033	0.041

Note: The table shows the net sectoral balance and its composition (each balance is the difference between the increases in financial assets and liabilities). Data are decadal averages, the average of the annual ratios by decade: 1960-69, 1970-79,...,2000-08. The data are from the FoF accounts and differ from the NIPA sectoral balances shown in Table 1.

#### 4.1 Household sector

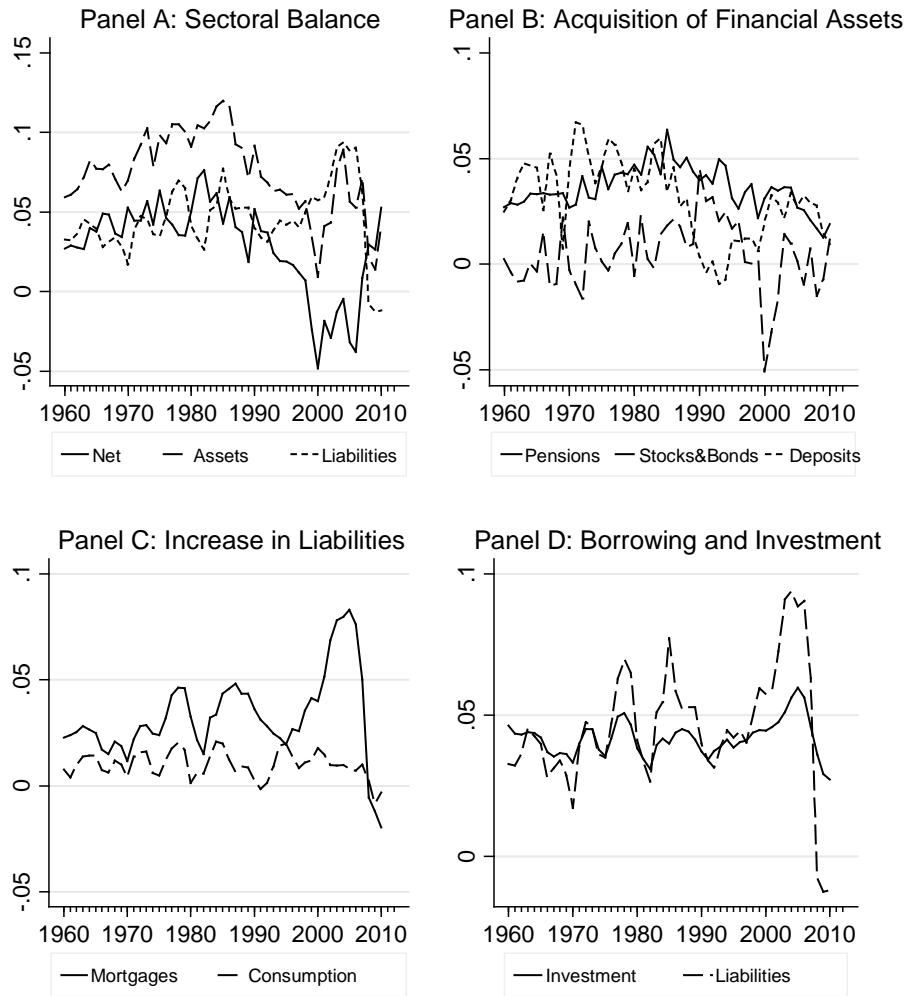
Net financial investment by the household sector was strongly positive in the 1960s and 1970s, which is curious to some degree because real returns faced by household savers in this period were more often than not negative. There is a strong precautionary motive for households' savings, which increased with overall uncertainty about the economy (Juster and Wachtel, 1972). After reaching a peak in the early 1980s, the overall savings rate started to decline, as seen before. The fall in was mainly due to a reduction in active savings – the acquisition of financial assets by households, as shown

in table 2. This decline was due to a sharp decline of deposit growth and a steady fall in pension contributions as shown in Figure 2. Pension contributions declined from around 5% of GDP in the 1980s to around 2% by the mid-2000s. Similarly, deposit acquisition averaged about 4% of GDP in the 1980s. By the mid-1990s, it had fallen to zero, before recovering somewhat in the 2000s. Putting money in the bank was no longer an attractive option to many Americans. To a lesser degree, bond and equity purchases also declined in the 1990s. Moreover, during stock market booms, US households were large net seller of equities – in the mid-1980s, late 1990s and again after 2005.

The long decline in the active savings of households ended in the late 1990s at which point we also observe a marked shift on the liability side of the household balance sheet. In short, in addition to a much-reduced rate of accumulation of financial assets, US households started borrowing strongly after 1998. The rapid increase in the incurrence of financial liabilities (borrowing) following the ongoing fall in the acquisition of financial assets (saving) resulted in an unprecedented deterioration in the overall financial balance of the household sector in the 2000s. For the first time in modern American history, the household sector, typically the provider of savings for the rest of the economy, started running a financial deficit as can be seen from Figure 2.

The reasons behind the surge in private borrowing are not hard to identify. Mortgage borrowing was by far the most important component of the run-up in household debt over the past 15 years. Mortgage borrowing increased rapidly from less than 2% of GDP in 1995 to 8% in ten years and reached a peak of close to 10% of GDP. Of course, the run-up in household borrowing occurred at the same time as the boom in household investment in housing which crossed the 5% of GDP line in the 2000s. The household sector borrowed for two reasons: first, to finance new investment in housing and house improvement. Second, households took on mortgage debt to finance consumption expenditure by withdrawing some of the increased equity in housing due to price appreciation (Greenspan and Kennedy 2008; Cooper 2009, 2010).

Figure 2: Composition of Household Sectoral Balance as % of GDP



Note: Panel A shows the sectoral balance and its components, the acquisitions of financial assets and the increase in liabilities. Panel B shows the major components of financial asset acquisitions. Panel C shows the major components of the increase in liabilities. Panel D shows household fixed investment and the increase in liabilities. Data are from the FoF accounts.

Table 3 summarizes the main changes in saving and borrowing behavior of American households. In the 1960s to 1980s, households acquired deposits and bonds as part of their active savings. Both forms of savings fell sharply in the 1990s but stabilized in the 2000s. The fact that net financial investment continued to deteriorate in the 2000s was due to the jump in mortgage borrowing. Contrary to frequent fears, consumer credit has not increased meaningfully (relative to GDP) in the past five decades.

Table 3: Composition of Household Sector Balance, Ratio to GDP, FoF Data

	1960s	1970s	1980s	1990s	2000s
Household Sector Assets	0.073	0.096	0.104	0.065	0.053
Deposits	0.038	0.053	0.040	0.004	0.029
Bonds	0.010	0.010	0.022	0.011	0.006
Equities	-0.010	-0.007	-0.011	0.008	-0.017
Pension	0.032	0.038	0.051	0.038	0.030
Household Sector Liabilities	0.036	0.048	0.051	0.044	0.070
Mortgages	0.022	0.031	0.036	0.029	0.058
Consumer Credit	0.010	0.013	0.010	0.010	0.010

Note: The table shows the composition of the household sector balance. Data are decadal averages. Data are decadal averages, the average of the annual ratios by decade: 1960-69, 1970-79, ..., 2000-08.

#### 4.2 Business sector

For most of the post-WWII period, the non-financial business sector ran a small financial deficit. Business sector investment typically exceeded sectoral savings by about 1% of GDP according to the NIPA data. In the Flow of Funds data, the deficit is slightly larger, but the errors and omissions can be large. Yet also according to Flow of Funds data, by the late 1980s and, by 1990, the US business sector essentially stopped investing more than it saved.<sup>3</sup> From 1990 until the onset of the financial crisis, net financial investment by the business sector hovered around zero.

However, business has not reduced its gross borrowing in a significant way. Figure 3 shows that despite wide year to year variation, corporate bond issuance and bank borrowing have not declined. Bank loans have declined somewhat over the decades, but increased issuance of bonds has substituted for this to a large degree. As a result, gross borrowing by the American business sector has not changed all that much.

Yet as the incurrence of financial liabilities by the business sector has not changed dramatically, the necessary corollary of overall net financial investment of the business sector that hovers around zero is that the acquisition of financial assets has increased by a

<sup>3</sup> National Income and Product Accounts and Flow of Funds data differ slightly with regard to the timing of the transition, but both tell fundamentally the same story.

corresponding amount. As shown in Figure 3, American business has indeed increased its acquisition of financial assets, in particular shares in money market mutual funds. Table 4 summarizes the observation that might seem paradoxical at first sight: American companies increasingly borrow long and lend short – the opposite of the function typically played by the banking system.

Table 4: Composition of Business Sector Balance, Ratio to GDP, FoF Data

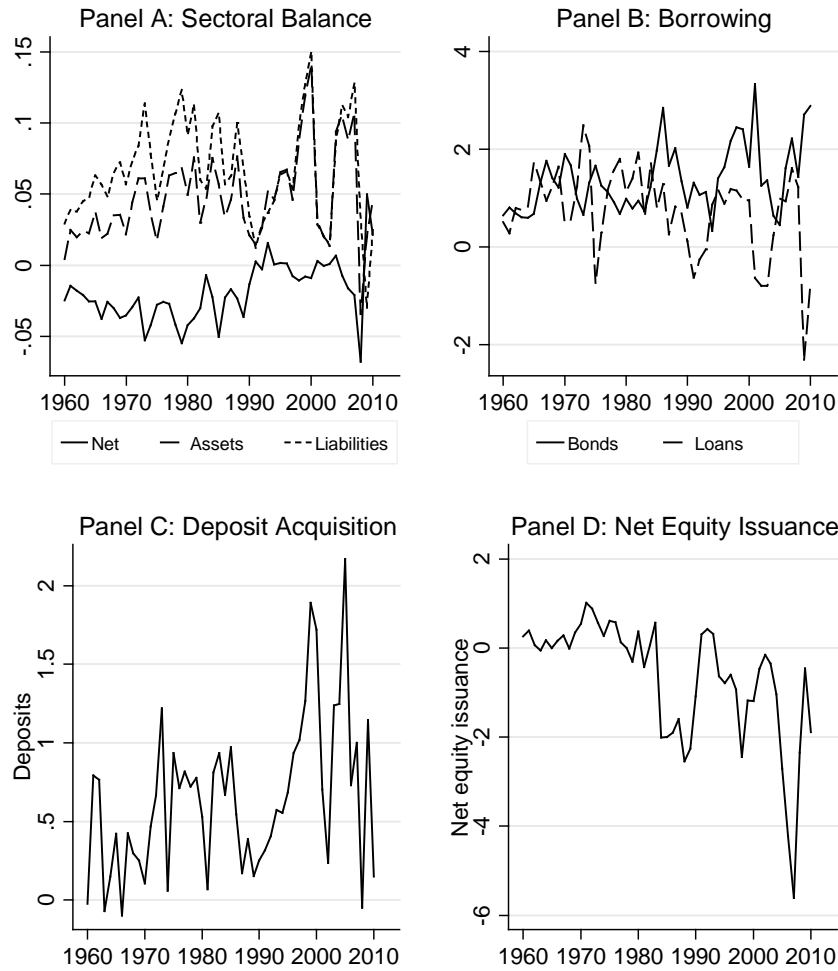
	1960s	1970s	1980s	1990s	2000s
Business Sector Assets	0.025	0.049	0.054	0.056	0.065
Deposits	0.003	0.007	0.005	0.006	0.005
Other	0.016	0.029	0.036	0.035	0.038
Business Sector Liabilities	0.052	0.086	0.084	0.058	0.078
Bonds	0.010	0.012	0.015	0.015	0.015
Loans	0.027	0.038	0.037	0.011	0.031
Equity	0.002	0.004	-0.012	-0.007	-0.020
Other	0.012	0.032	0.040	0.025	0.043

Note: The table shows the composition of the financial balance for the non-financial business sector from the FoF account. Data are decadal averages, the average of the annual ratios by decade: 1960-69, 1970-79,..., 2000-08.

How can we understand this trend? In the early 1990s and again in the early 2000s, real short-term interest rates were negative for extended periods; under these circumstances, the business sector may find it advantageous to maintain greater liquidity. Further, although the flow of funds classifies all financial intermediaries, in addition to banks, as part of the financial sector, it is possible that an element in the development of the shadow banking system was the increase in intermediary activity among business entities. As a result, the business sector, like the financial sector itself, shows large and offsetting acquisitions for financial assets and incurrence of liabilities. Much of this intersectoral intermediation can be due to corporate mergers and acquisitions and share buybacks. As we will see below, the rest of the world does not only lend to the US, it also borrows from it and much of that borrowing could be in the form of cross border investments by US businesses.

Finally, a look at net equity issuance of the business sector underlines once again how the financial behavior of American business has changed in the last few decades. For most of the 1960 and 1970s, U.S. business issued equity on a net basis. Further, as seen in the last panel of figure 3, that net equity issuance was relatively stable over the cycle. Starting in the mid-1980s, the net issuance of equity dipped below zero – companies were reducing equity liabilities on average – and stayed negative for the next 25 years (with one short exception in the 1990s). Importantly, there are clear indications that net equity issuance has become strongly pro-cyclical in the past two decades. Companies sharply reduce equity in boom times, presumably by using part of their profits for share buybacks. In 2007, the reduction in equity liabilities of the business sector reached an astonishing \$780 billion or about 5.6% of GDP. Overall, the trends in equity issuance mesh well with the overall themes of this section: the business sector has ceased to be a net importer of savings from other sectors. Its net financial investment is very close to zero. Companies have reduced outstanding equity and in some respects, their behavior resembles the financial sector, as we will discuss below.

Figure 3: Composition of Business Sectoral Balance as % of GDP



Note: Panel A shows the composition of the financial balance of the non-financial business sector. Panel B shows the major components of the increase in liabilities: bank borrowing and bond issuance. Panel C shows business sector acquisitions of deposits and Panel D shows the sectors net equity issuance (new issues less buybacks). Data are from the FoF accounts.

### 4.3 Foreign sector

The foreign sector has become the most important lender to the American economy. The growing integration of global capital markets has opened up a new source of funds for the increasingly savings-starved US economy. However, Figure 4 shows that the story is more complex than the simple observation that the current account deficit is a source of saving. The acquisition of financial assets by the rest of the world in the

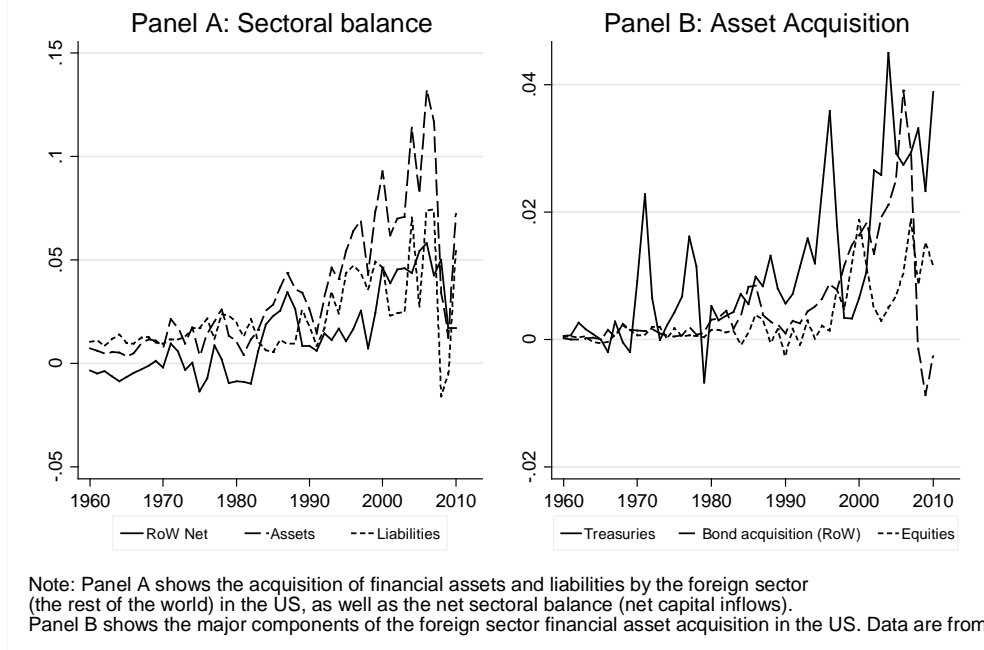


US grew rapidly from somewhat less than 5% of GDP in the 1980s to over 10% prior to the financial crisis. This is a larger swing than the increase in the current account deficit because foreign borrowing in the US has also increased strongly.

The detail in the Flow of Funds accounts provides us with a more precise picture of the capital inflows – the flip side of the current account deficit -- that supply funds to the domestic sectors. While in the 1970s and 1980s, foreign buying of Treasury securities was the only meaningful foreign savings flow into the US, private sector inflows became more important in the late 1990s. In the late 1990s, both fixed income and equity inflows averaged about 2% of GDP. Equity inflows fell sharply in the wake of the dotcom bubble and have not yet reached their previous highs. Nevertheless, the 1990s boom in foreign buying of US corporate and financial sector bonds continued. After 2001, foreign buying of treasury and agency securities also reached previously unprecedented levels. There had been short-lived spikes in foreign purchases of US government securities – in particular when interest rates peaked in the early 1970s and in the mid-1990s. Yet unlike in previous episodes the foreign inflow boom of the 2000s continued at a high level for almost a decade. Even during the crisis of 2008-09, foreign interest in treasuries remained high and inflows remained stable at around 3% of GDP.

Figure 4 also illustrates another unappreciated feature of the capital inflow boom of the 2000s. Inflows to the private sector (foreign acquisitions of private sector securities) were as large, if not larger, than foreign inflows into US government securities. Inflow into the corporate bonds grew enormously, reaching 4% of GDP before the crisis, although equity inflows played a secondary role and hovered around 1% of GDP. In net terms, purchases of foreign equities by Americans offset these large inflows. The most interesting interaction between the foreign sector and the domestic economy occurred in the financial sector, which is where we turn next.

Figure 4: Composition of Foreign Sector Balance as % of GDP



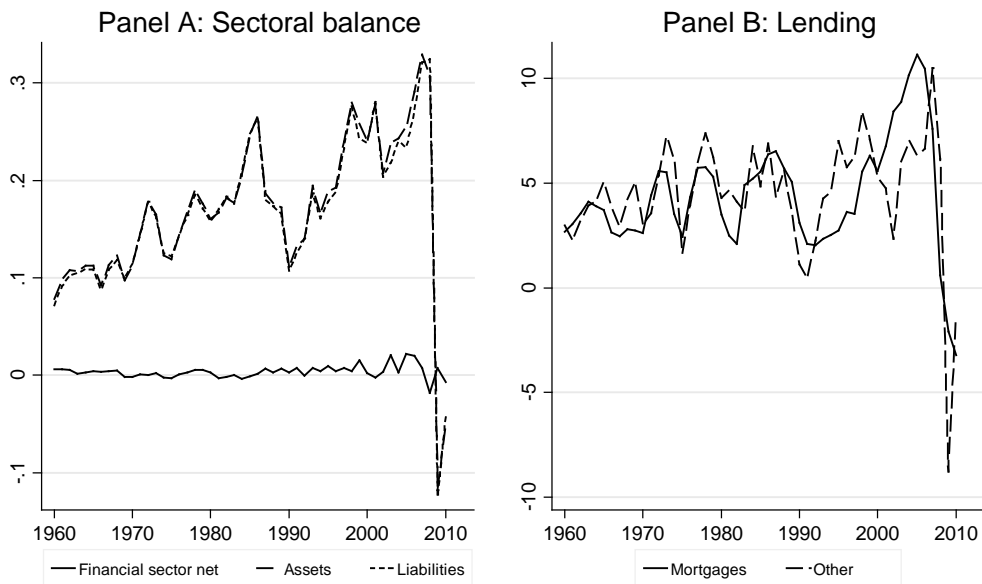
#### 4.4 Financial sector

The Flow of Funds accounts provide an additional perspective on the astonishing growth of financial intermediation in the past three decades. As shown in Figure 5, both asset acquisition and liability incurrence of the financial sector have grown strongly and steadily with the exception of the 1980s. In the 1960s and 1970s, the US financial sector intermediated savings flows on average of about 15% of GDP. Since 1990, the average savings flow has been about 25% of GDP and it reached a peak of almost 30% before the crisis. Of course, gross intermediary activity fell to below zero in the financial depression of 2009-10.

The Flow of Funds data allow us to examine the composition of this astonishing growth of the financial sector. Not surprisingly, on the asset side, the growth has mainly come from mortgage lending. The key role performed by the financial sector in the recent decade was to channel savings from the household sector, the business sector and the foreign sector into mortgage borrowing by American households. The annual increase in mortgages held by the financial sector increased from under 2% of GDP during the

recession of 1990-91 to more than 10% by the mid-2000s. There is evidence of a generalized credit boom as other forms of financial sector credit – unsecured consumer loans, business loans and corporate bond buying – also expanded relative to previous times. Nevertheless, the main driver was the tripling of mortgage lending in the 2000s relative to the 1990s.

Figure 5: Composition of Financial Sector Balance as % of GDP



Note: Panel A shows the overall balance of the US financial sector and its components, asset and liability acquisitions. Panel B shows two components of financial sector lending (asset acquisition): mortgages and other lending. Data are from the FoF accounts.

How did the financial sector fund the mortgage credit boom? A look at the liability side of the financial sector in Figure 6 shows that the main source of financial funding was non-deposit borrowing such as the issuances of bonds and other paper, with deposits coming a distant second. The growth in non-deposit borrowing was facilitated by financial market developments such as the Repo market and money market funds.

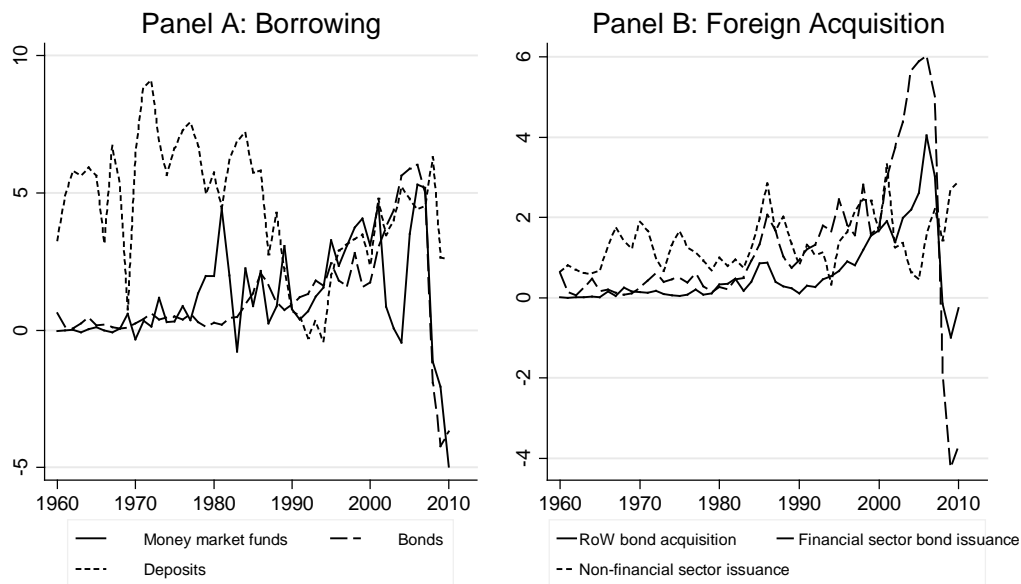
A closer look at the intermediary role of the financial sector indicates that a number of long-standing relationships dissolved over the past two decades. For most of the postwar period, the financial sector issued fewer bonds than it bought; deposits were a more important funding source. This is consistent with a traditional model of a financial intermediary sector that issues (short-term) deposits and uses them to buy (long-term)

bonds issued by the owners of investment projects, primarily the corporate business sector. In fact, over time purchases of business sector bonds grew in importance and were a substitute for direct lending in the form of bank loans. Yet after 2002-03, the opposite was the case. The financial sector began to issue more liabilities than it acquired. This dramatic shift is shown in Figure 6. By 2005, the financial sector issued about five times as many new liabilities as the non-financial business sector.

These trends illustrate the dramatic shift in the funding mix of the financial sector. Whereas deposits were the dominant source of funds for the financial sector until the mid-1980s, financial sector bond issuance and money market mutual funds play a much more central role today. Such new forms of non-monetary funding of the financial sector have loosened considerably the link between money and credit (Schularick and Taylor 2012). Since the 1980s, banks' access to non-monetary sources of finance has become an important factor for aggregate credit provision. The increasing dependence of the financial system on access to wholesale funding also means that central banks are forced to underwrite the entire funding market in times of distress in order to avoid the collapse of the banking system as experienced in 2008/09. The lender of last resort now must step in to confront non-deposit bank runs (Gorton and Metrick 2012).

Although the financial sector credit boom of the 2000s was a domestic phenomenon, the foreign sector was an important enabling factor. The expansion of the financial sector, which was needed to sustain the boom in mortgage lending, was increasingly supported by foreign purchases of private sector bonds. As we have mentioned before, the foreign sector was not only a major buyer of government securities, it also purchased private sector securities. Foreign buying of private sector bonds, filling the domestic funding gap of the US financial sector, was an important ingredient of the capital inflow boom of the past decade. Panel B of figure 6 shows that in the 2000s, the foreign sector emerged as a major source of funds for the expansion of the American financial sector. Yet it is also apparent that the foreign official (central banking) sector has little to do with the borrowing spree of the U.S. financial sector. The latter turned to foreign private savings to satisfy the insatiable mortgage hunger of American households.

Figure 6: Financial Sector Borrowing and Foreign Lending as % of GDP



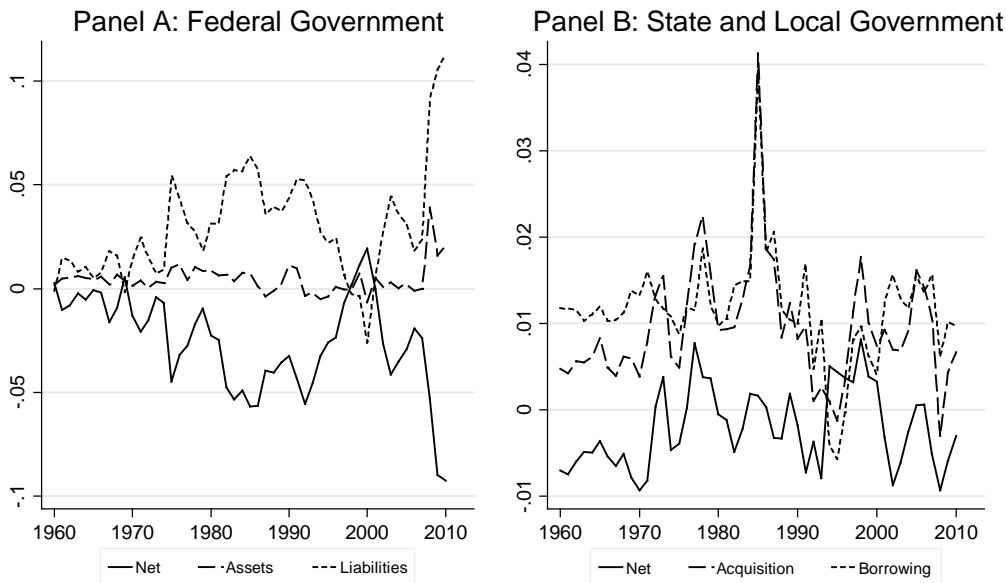
Note: Panel A shows the composition of borrowing by the US financial sector. Panel B shows the acquisition of bonds by the foreign sector and the issuance of bonds by the US financial sector and the non-financial sector. Data are from the FoF accounts.

#### 4.5 Government sector

The Flow of Funds story for the government sector is relatively straightforward. Federal government deficits drive the sector’s net financial investment since state and local governments are for the most part required to balance their operating budgets. However, the government sector, particularly at the state and local level, also acts as a financial intermediary that both issues liabilities and accumulates financial assets. Figure 7 shows that financial asset purchases by the government sector often run around 3% of GDP but without any discernible recent trends.

With regard to the trends in lending and borrowing the flow of funds tell the well-known story of the sequence of US public sector deficits in the past 50 years. Budget deficits widened sharply under the Reagan administration in the 1980s and stayed around 5% of GDP until the early 1990s. The deficits were closed in the boom of the 1990s, but the Bush tax cuts and the post 9/11 military activity led to renewed deterioration of the federal deficit in the 2000s. Finally, the deficits incurred after the global financial crisis were unprecedented in peace time.

Figure 7: Composition of Government Sector Balances as % of GDP



Note: The net financial balance of the government sector and its components: financial asset acquisitions and borrowing. The federal government balances are in Panel A and state and local government in Panel B. Data are from the FoF accounts.

#### 4.6 Summary

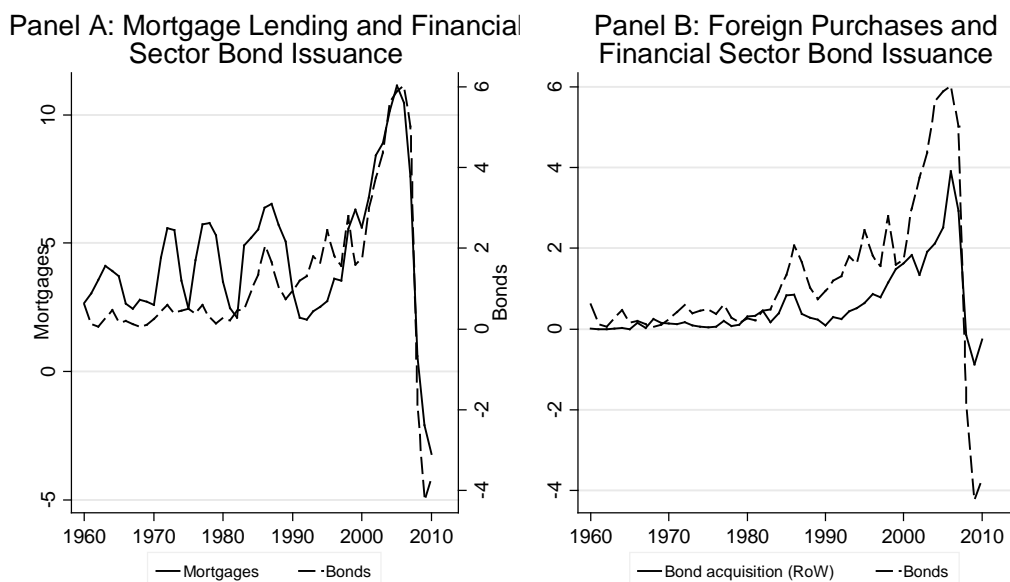
Closer analysis of the trends in individual sectors gives a picture that is considerably more granular than the standard twin deficit view and, in some respects, challenges conventional wisdom about the tight links between reserve accumulation around the world and the American credit binge. The biggest change in financial behavior in the past two decades has come from the household sector. Two significant trends emerged in the last two decades. First, in the 1990s American households sharply reduced their active savings which by the end of the decade stabilized at an historically low level where they remained roughly for the following decade. A second trend that quickly gathered speed in the 2000s is the rapid expansion of household borrowing, predominantly in the form of mortgages. Against the background of much reduced savings, the household sector started to run a financial deficit from 1998 on. In other words, it imported savings on a net basis from the other sectors. The financial sector intermediated the growing hunger of households for loanable funds from other sectors.

As the business sectors' savings closely mirrored investment and the government turned into a net borrower after 2000, only the foreign sector could provide the necessary funds. Yet these funds were private, not official.

Our examination of trends show some important features of the role of foreign sector inflows to the US in the last two decades. Most attention is given to the last decade when the Bush era increase in the government deficit coincided with the start of rapid foreign exchange reserve accumulation by China. The overwhelming share of foreign official inflows went into Treasury securities. However, a closer look shows that the decline in private sector US saving and the increase in the current account deficit dates back to the 1990s.

The increase in mortgage borrowing starting in the mid 1990s was financed by financial sector bond issuance (mortgage backed securities and pools). This is shown in Figure 8. The US financial sector tapped foreign savings; and the foreign private sector was the principal buyer of financial sector bond issues and the US financial sector itself absorbed the rest. Foreign official purchases of US assets linked to the accumulation of foreign exchange reserve in East Asia, did not play a major role in financing the credit hunger of American households. The credit boom in the US, the increase in the ratio of private debt to GDP, was driven by the growth of the domestic financial sector which increasingly relied on funds from foreign private capital inflows. At the risk of oversimplifying a complex picture, one could summarize that Beijing may have financed the war in Iraq while American and European private investors financed the mortgage bubble. In short, the U.S. credit boom that ended so badly was a product of financial globalization in the private sector; it had little to do with capital inflows from foreign governments. The American credit boom of the past two decades was essentially driven by the private sector.

Figure 8: The Foreign Sector and U.S. Mortgage Markets as % of GDP



Note: Panel A shows total US mortgage lending and bond issuance by the US financial sector. Panel B shows bond issuance by the US financial sector and purchases of privately issued bonds by the foreign sector. Data are from the FoF accounts.

## 5. FROM FLOWS TO STOCKS

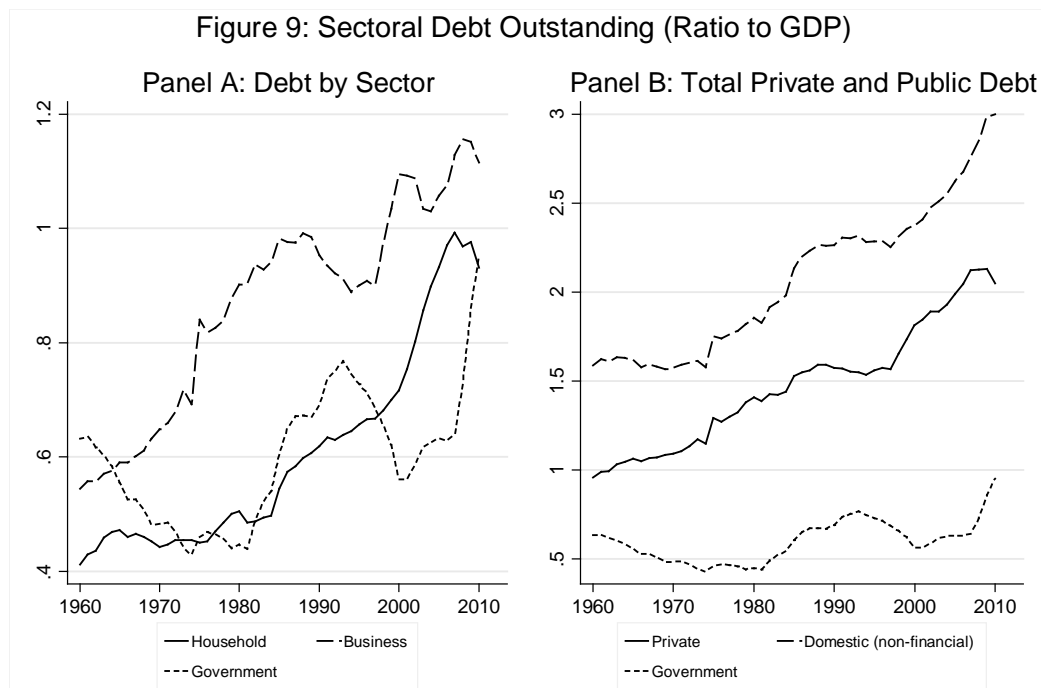
Our analysis of the history of American financial balances would not complete without a short look at the development of stocks of assets (wealth) and liabilities (debt). The main story here is a continuous increase in leverage, coming chiefly from the private sector. The dramatic rise of leverage of the American economy is shown in Figure 9. Until the 1980s, business sector debts expanded rapidly, but from the 1980s onwards it was mainly the household sector that increased debt. Total business debt to GDP has been rising throughout the period, from less than 60% to almost 120%, an even larger increase than that shown for the government since 1980. Government debt to GDP declined until the early 1980s, declined again in the 1990s and then rose sharply in the crisis. Household debt to GDP was relatively constant until the early 1980s.

Total debt of the domestic non-financial sectors (both private and the overall total) has increased steadily over the last 50 years (Figure 9, Panel B). The debt to GDP ratio roughly doubled since 1960, rising from slightly above 1.5 times annual income to



more than 3 times in 2010. However, there have been two episodes of rapid increase in overall leverage, for a decade starting in the mid 1970s and again for a decade starting in the late 1990s.

An extensive literature on finance and economic growth shows that increased financial depth (the ratio of debt to GDP) and more developed financial intermediary institutions are associated with higher levels of economic growth. However, it is also the case that rapid increases in financial depth can be characterized as credit booms, which can lead to economic instability and financial crises (Wachtel, 2011). Moreover, Schularick and Taylor (2012) show that crisis risks are higher in larger financial systems. The distinction between growth enhancing financial deepening and destabilizing credit booms is not readily apparent. However, it seems safe to say that relative to its long run path, it is not evident that the credit boom of the past decades has led to acceleration in the trend rate of growth.



Note: Panel A shows the stock of debt outstanding for the US domestic sectors. Panel B shows the debt of the domestic non-financial sectors and its components: private and government. Data are from the FoF accounts.

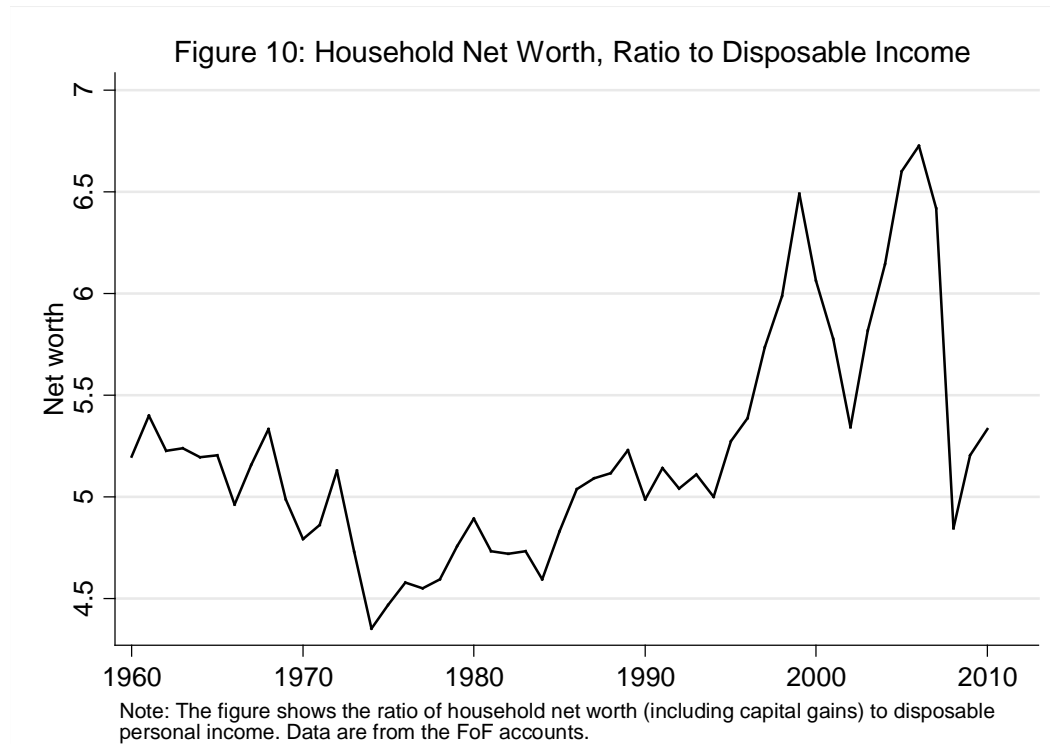
A corollary of the increasing financialization and higher leverage of the American economy, are the large swings in net worth that result from asset price fluctuations. As

liabilities are largely fixed in the short run, such declines in the value of assets result in equally large movements in net worth. From the perspective of American households, the gains during the boom years have more than compensated for the decline in active savings. From 1995 to 2000, the (unrealized) capital gains on households' equity holdings were between 20% and 40% of GDP per year – a multiple of flow-based savings rates. Nonfinancial capital gains – chiefly stemming from the price appreciation of the housing stock – averaged about 5% of GDP over 1980-2000 before increasing sharply in the housing boom of the 2000s. During the peak years of the housing boom, wealth gains stemming from house price appreciation reached between 10% and 15% of annual GDP. Accumulating over a number of years, this led to a sizeable improvement of the net worth position of American households despite the decline in active savings, as can be seen in figure 10.

Figure 10 shows the wealth position of the household sector (relative to disposable income). It varies widely as the value of equities and housing change. Household net wealth levels improved strongly in the late 1990s, driven mainly by the equity boom, and in the 2000s when a synchronous surge in house and stock prices pushed net worth ratios sharply higher. The figure also illustrates the unprecedented nature of the post-2007 collapse. Never before in recent history have both housing and equity wealth collapsed at the same time to this extent. The collapse in house prices and the decline in equity wealth during the financial crisis has brought the net worth of American households back to the levels seen between 1960 and 1990 – about five times disposable income, but it has recovered since.<sup>4</sup>

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<sup>4</sup> This is only true for aggregates. As inequality has grown, the distribution of wealth is not the same as in previous decades.



## 6. CONCLUSION

Our panoramic tour across 50 years of sectoral balances in the US economy yields a number of new and potentially important insights. Long-standing relationships in the financial structure of the US economy have dissolved in the past decades. Today's patterns of financial intermediation bears, overall, only limited resemblance to textbook models where household savings are intermediated into business investments. American business has vastly expanded its financial relations with other sectors, but its financial balance is flat and the sector not a meaningful net borrower. Not only the business sector, but also American households have displayed a striking change in savings behavior. For the first time in modern history, households in the noughts have turned into net borrowers from other sectors and are no longer providing savings to the rest of the economy. The household sector has clearly seen the most dramatic shift in financial balances in the decades before the crisis. This shift in the household financial balance is connected to

trends that were underway long before the emergence of global imbalances and reserve accumulation in emerging markets. Already in the 1990s, American households dramatically reduced their acquisition of financial assets. Potentially in response to rising equity wealth during the stock market boom of the 1990s, households' acquisition of financial assets dropped from about 10% of GDP in the 1980s to slightly above zero in the late 1990s. Against the background of record low active savings rates, households started to borrow strongly after 1998 as the value of the housing stock appreciated and mortgage equity withdrawals helped sustain rapid consumption growth.

Finally, our study reveals a much looser link between global imbalances and the American credit boom than is often assumed. Our results here mesh with recent emphasis on gross, not net savings flows (Borio and Disyatat 2011; Shin 2011; Obstfeld 2012, Lane and McQuade 2013). The American financial sector increasingly intermediated foreign capital in order to finance the housing credit boom of the 1990s. It fed the credit hunger of the American economy mainly by issuing debt liabilities in international financial markets; as a result, American financial institutions could finance a lending boom of historic proportions despite low domestic savings. The foreign private sector, not foreign governments, provided much of the fuel for the fire. Foreign official inflows went almost exclusively into Treasury securities while private investors bought bonds and other instruments by U.S. financial intermediaries. Those who are looking for international drivers of the American credit bubble should not look to Beijing and Riyadh, but to international *private* capital markets. The capital inflow bonanza of the 2000s that enabled the rapid build-up in leverage (Chinn and Frieden 2011) was primarily a private sector inflow. Beijing financed the war in Iraq at low cost while Wall Street, foreign banks and private investors fueled the housing bubble.

## APPENDIX: DATA SOURCES

### 1. National Income and Product Accounts

National and Sectoral Saving and Investment Balances: Table 5.1. “Saving and Investment by Sector”, Time period: 1960-2012;

The data used here are from the release on Aug 29, 2013, and include the results of the 2013 Comprehensive Revision of the National Income and Product Accounts. They can be retrieved online from the Bureau of Economic Analysis:

[https://www.bea.gov/national/nipaweb/SS\\_Data/Section5All\\_Hist.xls](https://www.bea.gov/national/nipaweb/SS_Data/Section5All_Hist.xls)

### 2. Flow of Funds

Sectoral financial balances and their composition are taken from the Z.1 Flow of Funds Accounts of the United States;

The data used here are from the March 7, 2013, release and can be retrieved online from Board of Governors of the Federal Reserve System:

<http://www.federalreserve.gov/releases/z1/>

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