

## BEA BRIEFING

# A Guide to the Integrated Macroeconomic Accounts

By Takashi Yamashita

THIS PAPER summarizes the main features of the integrated macroeconomic accounts (IMAs) and illustrates possible uses of the information in the accounts for economic and policy analysis. The IMAs comprise a sequence of macroeconomic accounts that link production and income to changes in net worth for the U.S. economy. The accounts detail the sources and uses of the funds that are made available for capital formation or net lending as well as track assets and liabilities of major sectors of the economy. In identifying the sources of changes in net worth, the IMAs provide information on changes in the market values of assets and liabilities, which are important drivers of changes in net worth.

The Bureau of Economic Analysis (BEA) and the Federal Reserve Board (FRB) jointly developed the IMAs for the United States. These accounts bring together data from BEA's national income and product accounts (NIPAs) and the FRB's flow of funds accounts (FFAs), use consistent definitions, and present the information in a unified framework. The IMAs are part of an interagency effort to integrate the NIPAs and the FFAs, to fill information gaps, and to enhance international comparability of the U.S. national accounts. The background for these accounts and a blueprint for the IMAs are detailed in Jorgenson and Landefeld (2006), and a prototype is presented in Teplin and others (2006). The initial release of the IMAs was accompanied by a February 2007 article in the *SURVEY OF CURRENT BUSINESS* (Bond and others 2007). In 2010, the IMAs were expanded to include quarterly estimates dating back to 1992. Quarterly estimates back to 1960 were released in June 2012. Annual and quarterly ta-

bles are updated about 75 days after the end of the quarter and made available both on the FRB and the BEA Web sites.

This paper focuses on aspects of the IMAs that may be of interest for economists and points out the accounts' potential pitfalls. The organization and performance of the IMAs in tracking the economy are more thoroughly discussed in Bond and others (2007) and Cagetti and others (2012).

The remainder of this article discusses the following:

- The structure of the IMAs
- The unique advantages of the IMAs
- Special features of the IMAs
- A look at a few examples that illustrate developments in the U.S. economy before the financial crisis and the recession of 2007–2009 and the recovery<sup>1</sup>
- Concluding remarks

### The Structure of the IMAs

The organizing framework of the IMAs comes from the *System of National Accounts (SNA) 2008*. The *SNA* is a set of international guidelines on how to record and summarize the transactions of the major sectors of domestic economy with each other and with the rest of the world. The *SNA* defines the major institutional units and sectors in an economy as well as the flows (production and generation of income and the acquisition of assets and liabilities), the direction of flows between sectors (sources and uses of funds), and the stocks of types of assets and liabilities. The sequence of accounts in the *SNA* begins with the production account, which derives each sector's gross value added. Following the production account is a series of accounts that flow into one another to track the sources of change in the net worth of each sector. These accounts are also summed across sectors to obtain consolidated accounts for the total economy.

While the IMAs are largely in accordance with the *SNA*, the two accounts differ with respect to the sectors within the domestic economy. The difference in

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1. Analysis in this paper is based on IMA tables downloaded from the BEA Web site on December 20, 2012. For detailed information about the charts in this section, please see the special Appendix in the online *SURVEY* at [www.bea.gov/scb/index.htm](http://www.bea.gov/scb/index.htm).

sectoring reflects specific characteristics of the U.S. economy, particularly how the nonfinancial business sector and the government sector are organized. The *SNA* divides the domestic economy into five sectors: nonfinancial corporations, financial corporations, general government, nonprofit institutions serving households (NPISH), and households. In the *SNA*, noncorporate businesses are either treated as quasi-corporations or consolidated into the household sector, depending on their degree of formality.<sup>2</sup> The IMAs, however, divide the domestic economy into six sectors: households and NPISH; nonfinancial noncorporate business, which includes nonfinancial partnerships and sole proprietorships; nonfinancial corporate business; financial business; the federal government; and the state and local governments. In addition, both the *SNA* and the IMAs record international transactions in the rest of the world table.

Government enterprises are included in the government sector in the IMAs. Government enterprises are government agencies that sell their goods and services directly to the public for a price and recover part or all of their operating costs.<sup>3</sup> The *SNA* recommends classifying institutional units based on their residency and principal economic activity rather than on their ownership and controlling interest; therefore, U.S. government enterprises would be classified as quasi-corporations and included in the nonfinancial noncorporate business sector or the financial business sector under the *SNA*. In the NIPAs, the treatment of specific government agencies is more complicated, as the NIPAs take a “mixed” approach.<sup>4</sup> In the NIPAs, government enterprises are treated like businesses and are classified as noncorporate business with respect to their income, value added, compensation payments, and consumption of fixed capital. On the other hand, their interest payments and receipts, fixed investment, and inventory change are combined with the govern-

ment sector. The IMAs treat them consistently as part of the government sector.

For each sector, the IMAs use the sequence of six accounts to trace the transmission of income to wealth: current account, capital account, financial account, other changes in volume account, revaluation account, and balance sheet account. The first three accounts record transactions, and the next two accounts document changes in assets and liabilities not related to economic transactions. The balance sheet presents the total stocks of assets and liabilities and the level of net worth of each sector of the economy.

### Current account

The current account, which is derived from NIPA data, summarizes the generation, distribution, and uses of income. In the IMAs, this account begins with the income that each sector receives from engaging in economic production as measured by gross value added. The net operating surplus of the sector is then derived as gross value added less consumption of fixed capital (or economic depreciation), payments for labor inputs, and “taxes on production and imports less subsidies.” Sources of income by income type—including property income aggregates such as interest and dividends, and, in the case of households, receipts of compensation—are added, and payments of property income are subtracted to arrive at the balance of primary incomes received by each sector.<sup>5</sup> Next, the current account shows the adjustments made to primary incomes (such as taxes, social benefits and contributions, and current transfers) to arrive at disposable income. Finally, net saving is the residual amount of disposable income that remains after final consumption expenditures.

### Capital account

The capital account, which is based on NIPA data, details the relationship between net saving, net investment, and net lending. This account shows gross investment (and for some sectors, the allocation of investment funds between residential and nonresidential fixed investment), acquisition of nonproduced assets, and changes in inventories. Net lending (or borrowing) in the capital account shows how much surplus (or shortage) of funds a sector has after paying for fixed capital formation, consumption of fixed capital,

2. The *SNA* defines a quasi-corporation as an unincorporated business that is operated as if it were incorporated and shares many of the attributes of a corporation.

3. Government enterprises differ from government-sponsored enterprises (GSEs), which are included in the financial business sector. GSEs are financial-services corporations created by Congress but are owned by their stockholders, such as Farm Credit System, Federal Home Loan Banks, Fannie Mae, and Freddie Mac. Government enterprises are governmental units that sell goods and services to households and businesses and cover all or most of their expenses from revenue. Under the federal government, there are currently 15 government enterprises, including the U.S. Postal Service, regional electric power enterprises, and insurance enterprises. For state and local governments, specific government functions—such as local transit, utilities, and liquor stores—are classified as enterprises.

4. The NIPAs take a mixed approach for government enterprises because of data limitations. The source data for government enterprises are consolidated with government accounts and do not allow for straightforward separation of the enterprises' accounts from the accounts of general government.

5. In the *SNA*, the portion of national income received by a sector is known as its “balance of primary incomes, net.” The line in the IMA tables that shows this concept is therefore labeled “net national income/balance of primary incomes, net.” In tables S.1.a and S.1.q, which cover the total economy, this line shows net national income from table 1.12 of the NIPAs.

net acquisition of nonproduced nonfinancial assets, such as natural resources, and inventory accumulation.

### Financial account

The financial account, which is based on the FFAs, records each sector's portfolio changes from acquisitions of financial assets and liabilities. In the financial account, a sector's net lending or borrowing is calculated by subtracting its net incurrence of liabilities from its net acquisition of financial assets. In principle, the value of net lending or borrowing in the financial account should match the value from the capital account, because saving and net receipts of capital transfers not used for capital investment must be used to acquire financial assets or to retire liabilities. However, the values for the two measures seldom coincide precisely, because of discrepancies in source data, timing differences, and difficulties in adjusting the source data to remove holding gains from reported revenue or changes in positions.

### Other changes in volume account

Saving and capital transfers do not entirely account for the change in net worth because other changes in balance sheet items can occur. The "other changes in volume" account includes disaster losses (such as those from hurricanes or earthquakes), uncompensated seizures of foreign asset, and other items. In addition, although the *SNA* does not include expenditures on consumer durable goods in investment, the IMA balance sheet for the households and NPISH sector includes consumer durable goods as an asset. Net investment in consumer durable goods is thus included in the other changes in volume account to reconcile the difference in definitions. Finally, the statistical discrepancy, measured as the difference between net lending and borrowing in the capital account and in the financial account is recorded.

### Revaluation account

The revaluation account shows the changes in net worth resulting from holding gains and losses on different types of assets and liabilities. These revaluations are mainly for market values of certain assets and liabilities such as real estate, corporate equity, and mutual funds. The revaluation account includes the line item "changes in net worth due to nominal holding gains/losses," which sums up the holding gains and losses attributable to different assets and liabilities. The change in net worth is shown between the revaluation account and the balance sheet account to summarize changes arising from all sources combined (net saving, capital transfers, other changes in volume, and nominal holding gains).

### Balance sheet account

A key purpose of the IMAs is to account for the sources of changes in net worth. The sequence of accounts thus ends with a balance sheet that shows the values of assets and liabilities at the end of the accounting period and the net worth of the sector.

### Unique Advantages of the IMAs

The IMAs bring together information on the U.S. economy that previously was available only from disparate sources. The major innovations of the IMAs include the following:

- Data are presented in a convenient, easy-to-use format. In addition to quarterly and annual tables of the seven sectors, data for the total economy (current account) and selected aggregates are presented in separate tables.
- The FRB has introduced an online documentation system that provides detailed information on how each series in the IMAs and the FFAs is constructed. With a few mouse clicks, users can easily trace which series are used to construct a specific line in the IMAs with references to NIPA and FFA tables.
- Income and expenditure information from the NIPAs and balance sheet data from the FFAs are presented together within a single table, facilitating calculation of financial ratios for economic analysis.
- Balance sheets are presented for the six sectors of the domestic economy and for the rest of the world.<sup>6</sup> Before the IMAs were developed, the balance sheet information available from the FFAs covered only the household and NPISH sector and nonfinancial business sectors.
- The IMAs derive each sector's net lending to the rest of the economy from two sources: the capital account and the financial account. The NIPAs provide the capital account measures of net lending or borrowing only for households, aggregate domestic business, state and local government, and federal government sectors. The net lending and borrowing position of the other sectors had not previously been available except by combing through multiple tables in the FFAs.
- The IMAs delineate four sources of changes in net worth: saving, capital transfers, nonprice changes that do not arise from a transaction such as disaster losses, and variation in the market prices of assets and liabilities. One goal of the IMAs is to link production and expenditures to changes in net worth,

6. The nonfinancial assets on the balance sheets of the financial business and the government sectors exclude residential real estate and land. The balance sheet of the rest of the world includes only financial assets that represent claims on the U.S. assets and liabilities that represent claims of the United States.

and changes in net worth arising from asset price fluctuations are indispensable for doing this.

- The IMAs highlight the overwhelming importance of holding gains in wealth accumulation. Changes in net worth due to nominal holding gains/losses account for more than half of the changes in net worth for the household sector in almost all years. In some years, changes due to nominal holding gains exceed 100 percent of the total changes in the households' net worth. (See the box, "Dominance of Holdings Gains in Household Wealth Accumulation.")

### Special Features of the IMAs

The organization of accounts and terminology of the IMAs differ from those of the NIPAs and the FFAs in several areas. For example, the two accounts differ on the concept of "disposable income." In the NIPAs, personal interest payments on consumer debt are not subtracted in calculating the disposable income of the household sector; instead, these payments are considered part of personal outlays. In the IMAs, however, the interest payments by households are deducted from property income and are therefore not included in disposable income of the household sector. This

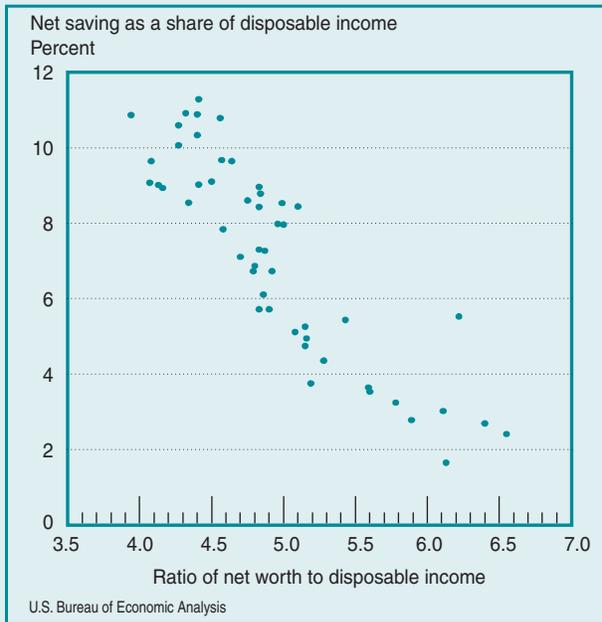
#### Dominance of Holding Gains in Household Wealth Accumulation

The personal saving rate declined steadily from the mid-1980s to 2007. The saving rate rebounded in 2008, when net worth of the household sector decreased after the financial crisis. The decline in the saving rate is correlated with the increase in the net worth of the household sector. Chart A shows the relationship between the ratio of household net worth to disposable income and the net saving-to-disposable income ratio for the household sector from the integrated macroeconomic accounts. The saving rate and the net worth-to-disposable income ratio tend to move in opposite directions.

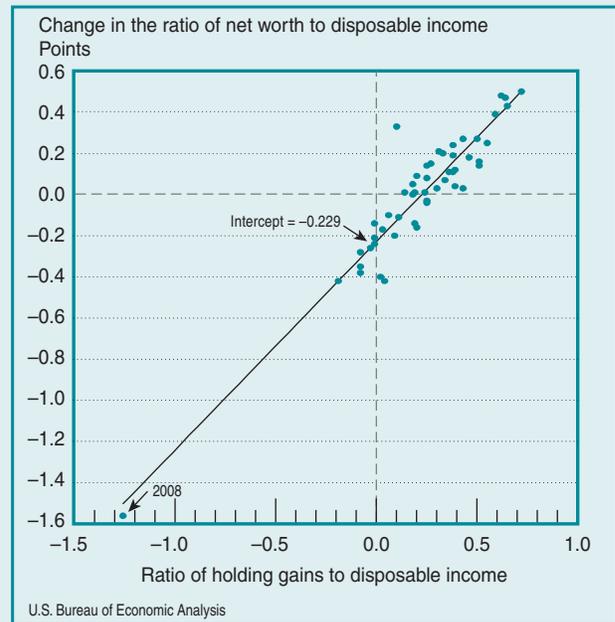
Of the four sources of change in net worth (saving, capital transfers, nonprice changes, and holding gains),

holding gains have been the driving force of wealth accumulation of the household sector. To underscore this point, chart B plots the annual change in the ratio of net worth to disposable income against the ratio of holding gains to disposable income. Most plots cluster around a straight line with a slope of 1, implying that a 1 percentage point increase in the ratio of holding gains-to-disposable income translates into a 1 percentage point increase in the ratio of net worth to disposable income. The fitted line intersects the vertical axis at  $-0.229$ . A negative intercept implies that the ratio of net worth to disposable income on average would decline if there are no holding gains on net worth in a year.

**Chart A. Household Net Worth and Saving Rate, 1961–2011**



**Chart B. Holding Gains and Changes in Net Worth, 1961–2011**



exclusion of interest payments from disposable income is consistent with the treatment of interest payments by noncorporate and corporate businesses, in which interest payments are subtracted before taxes to calculate net income.

The disposable income of the business sector is not reported in the NIPAs but is reported in the IMAs. Disposable income for the corporate sectors differs from after-tax profits because of the treatment of dividend payments. In the IMAs, dividend payments are treated similar to interest payments: they are subtracted from primary incomes to arrive at disposable income. Because dividends are included in the balances of primary incomes of the sectors that receive them (mainly the household sector), they must be subtracted in calculating the balances of primary incomes of sectors that pay them. Similar to the household sector, disposable income of the corporate sectors represents an internal source of funds available for investment.

In addition, the IMAs treat the market value of corporate equities as a liability of the issuer. This means that the market value of corporate equities is excluded from the issuer's net worth in the IMAs. However, in the FFAs, shareholders' or owner's equity is treated as the net worth of the corporate business sector. The IMAs' measure of corporate net worth excludes the market value of corporate equities because these equities are treated as assets of other sectors in the economy, and these positions should cancel out when all domestic sectors are consolidated into a balance sheet for the total economy.<sup>7</sup> As a result, the reported net worth of the corporate sector in the IMAs could be negative for a sustained period of time when there is a bull market for corporate equities.

Because of this treatment of corporate equity, a decrease in the market value of corporate equity is treated as a decrease in liabilities in the revaluation account, leading to an increase in the reported net worth of the issuer of the equity. In 2008, for example, the market value of corporate equity issued by nonfinancial corporate business plummeted by about \$5.4 trillion in the midst of the financial crisis (table S.5.a, line 90), while the market value of nonfinancial and financial assets held by this sector declined by \$1.3 trillion (table S.5.a, line 82+line 86). Because the change in net worth is defined as the change in the value of assets minus the change in the value of liabilities, these changes led to an increase in net worth of the nonfinancial corporate business sector of about \$4.2 trillion (table

7. In other words, this treatment is based on the notion that a way to compute the net worth of the nation is to add up the net worth of all sectors. The nation's net worth is based on the recorded values of corporate assets rather than on the market value of equity shares outstanding.

S.5.a, line 92). (See the box, "Corporate Equity in the IMAs and the FFAs.")

Users of the IMAs who want to compute financial ratios such as leverage or return on equity must therefore bear in mind that the reported net worth in the IMAs is different from a financial-accounting definition of net worth. In standard corporate finance textbooks, financial leverage is defined as total assets divided by net worth as calculated without any subtraction of the value of equity (see Fridson and Alvarez 2011). Because the IMAs exclude corporate equity from net worth, analysts must add the value of equity to the reported net worth to compute ratios that are comparable with the financial ratios used in standard financial analysis.<sup>8</sup>

### Performance of the IMAs Before and After the Financial Crisis

Two goals of the IMAs are to improve the ability to monitor new developments in the economy for timely policymaking and to facilitate economic analysis by conveniently presenting data in one place. How did the IMAs fare in achieving these objectives? Were the IMAs able to provide pertinent information on risks that households were taking in the early 2000s? How can data in the IMAs be used to understand characteristics of the 2007–2009 recession and slow recovery afterwards? This section presents a few examples of the potential uses of the IMAs to analyze the U.S. economy.

The U.S. economy in the first decade of the 21<sup>st</sup> century was characterized by the following:

- High levels of household borrowing and debt-financed housing investment and as well as spending boom until 2007, when there was a sharp drop in household borrowing and investment in housing.
- A sudden drop in liquidity in the financial system in 2008
- A sharp contraction of the household balance sheet, accompanied by a dramatic reduction in private-sector demand. Even though the recession ended in the second quarter of 2009 and interest rates are near zero, many households and businesses still hesitate to increase their spending.

### Household leverage in the early 2000s

Many policymakers and economists were taken by surprise by the financial crisis of 2007–2008 because the

8. One way to compute net worth for the corporate business sectors comparable to standard financial analysis is to follow the FFAs' approach. For nonfinancial corporate business (table S.5.a), the FFAs' definition of total equity is corporate equity (line 136) plus net worth (line 143). For financial business (table S.6.a), total equity is defined as the sum of corporate equity (line 140), equity in noncorporate business (line 142), and net worth (line 149).

increases in the household sector's financial leverage and debt service ratios in the years leading up to the financial crisis seemed modest (Palumbo and Parker 2009). Stocks of assets and liabilities generally change more slowly than flows, so financial leverage, defined as the ratio of total assets to net worth, tends to change gradually. Despite the large amount of mortgage debt amassed by the household sector in the early 2000s, IMA table S.3.a shows that the financial leverage of the sector increased only modestly, from 1.18 in 2001 to 1.22 in 2007, because rising house prices were pushing up the value of housing assets at the same time mortgage debt was rising. The leverage ratio calculated from the balance sheet at the aggregate level, therefore, may not be an appropriate metric to assess the risks that households are taking. Policymakers may require more detailed measures of leverage to understand economic developments (Geanakoplos 2010; Landefeld

and others 2010).

In addition, as shown in table 1, the rise in the households' debt service ratio (the ratio of households' debt payments to disposable personal income) from 2000 to 2007 was less than 2 percentage points, from 12.2 percent in 2000 to 14.0 percent in 2007.

Using data from IMA table S.3.q, another measure of leverage that might have forewarned about rising household indebtedness before the financial crisis can be constructed. Chart 1 plots the ratio of the household sector's net incurrence of mortgage debt to gross residential fixed investment from 1974 to 2007.<sup>9</sup> This

9. Note that this ratio is not the same as the loan-to-value ratio of new mortgages. This ratio could be well over 1 as the denominator (gross residential capital formation) only accounts for new housing investment and brokers' commissions on sales of used structures, while the numerator takes into account all additional mortgages including those used to purchase housing units built in earlier years.

### Corporate Equity in the IMAs and the FFAs

Corporate equity is considered a liability of an issuer in the integrated macroeconomic accounts (IMAs) and thus is not included in the net worth of the issuer's balance sheet. As a result, an increase (decrease) in the market value of corporate equity reduces (increases) the net worth of the corporate business sector. In the flow of funds accounts (FFAs), however, shareholder's equity is treated as the net worth of the corporate business sector. The reported values of net worth in the IMAs and the FFAs thus differ for the corporate business sectors.

The table below compares the net worth of the nonfinancial corporate business sector between the IMAs and the FFAs from 2007 to 2009. In the IMAs, the net worth

of nonfinancial corporate businesses increased by \$3.7 trillion in 2008 from a year earlier while the market value of equity decreased by \$5.4 trillion. However, the FFAs reported a decrease of net worth by \$2.0 trillion during the same period. The difference between the two measures is \$5.7 trillion, 94 percent of which is accounted for by the decline in the market value of corporate equity. In 2009, nonfinancial corporate business' net worth decreased \$4.8 trillion in the IMAs, while the decrease was about \$2.3 trillion in the FFAs. The difference of \$2.5 trillion is close to the amount of the holding gains of corporate equity.

**Net Worth and Change in Net Worth in the Integrated Macroeconomic Accounts and the Flow of Funds Accounts, Nonfinancial Corporate Business Sector**

Line	2007	2008	2009	
	Billions of current dollars			
<b>Integrated macroeconomic accounts: Nonfinancial corporate business <sup>1</sup></b>				
Revaluation account				
1	Corporate equity (line 90) .....	1,915.2	-5,378.2	2,542.6
Balance sheet account (end of period)				
2	Corporate equity (line 136) .....	15,730.7	10,016.6	12,494.6
3	Net worth (line 143) .....	1,870.1	5,619.6	794.4
4	Change in net worth from the previous year .....	912.5	3,749.5	-4,825.2
<b>Flow of funds accounts: Nonfinancial corporate business <sup>2</sup></b>				
5	Net worth (line 32) .....	17,600.8	15,636.2	13,289.0
6	Change in net worth from the previous year .....	2,040.9	-1,964.7	-2,347.2
7	Differences in measures of change (line 6–line 4) .....	1,128.4	-5,714.2	2,478.0
Percent				
8	Changes in the net worth accounted for by revaluation of corporate equity issues (line 1/line 7x100)	169.7	94.1	102.6

1. These estimates and the line numbers in parentheses are from table S.5.a from the Bureau of Economic Analysis.  
2. These estimates and the line numbers in parentheses are from table B102 from the Federal Reserve Board.

**Table 1. Household Debt Service Ratio and Financial Obligations Ratio, Selected Years**  
[Percent]

	Debt service ratio <sup>1</sup> (Total)	Financial obligations ratio <sup>2</sup>				
		Total	Renter	Homeowner		
				Total	Mortgage	Consumer
1985 .....	11.6	16.9	25.3	14.8	9.3	5.4
1986 .....	12.1	17.6	26.4	15.3	9.6	5.7
1987 .....	12.2	17.7	26.6	15.5	9.8	5.7
1988 .....	11.9	17.3	25.8	15.2	9.7	5.5
1989 .....	11.9	17.2	25.0	15.3	9.9	5.4
1990 .....	11.9	17.3	24.7	15.4	10.2	5.2
1991 .....	11.6	17.1	24.1	15.2	10.3	4.9
2000 .....	12.2	17.3	29.4	14.8	8.8	6.1
2001 .....	12.7	17.8	30.6	15.3	9.0	6.3
2002 .....	13.0	17.9	29.4	15.7	9.2	6.5
2003 .....	13.1	17.9	27.2	16.0	9.5	6.5
2004 .....	13.2	17.8	25.6	16.3	9.8	6.5
2005 .....	13.6	18.3	25.1	16.9	10.5	6.5
2006 .....	13.8	18.6	25.1	17.3	10.9	6.3
2007 .....	14.0	18.9	25.4	17.6	11.3	6.3

1. Required payments on outstanding mortgage and consumer debt as a percentage of disposable personal income.

2. The financial obligations ratio adds automobile lease payments, rental payments on tenant-occupied property, homeowners' insurance, and property tax payments to payments included in the debt service ratio.

Source: Federal Reserve Board ([www.federalreserve.gov/releases/housedebt](http://www.federalreserve.gov/releases/housedebt)).

ratio summarizes how much additional mortgage debt is incurred by the household sector relative to its investment in residential structures. This ratio was around 1.0 or below until 1986, but it reached 1.5 in the late 1980s and exceeded 1.5 in the early 2000s.

Both the late 1980s and the early 2000s were periods of declining mortgage interest rates. Many households took advantage of the falling interest rates and refinanced mortgages. Home equity lines of credit, which could easily be used to tap into home equity, were also heavily promoted in both periods.

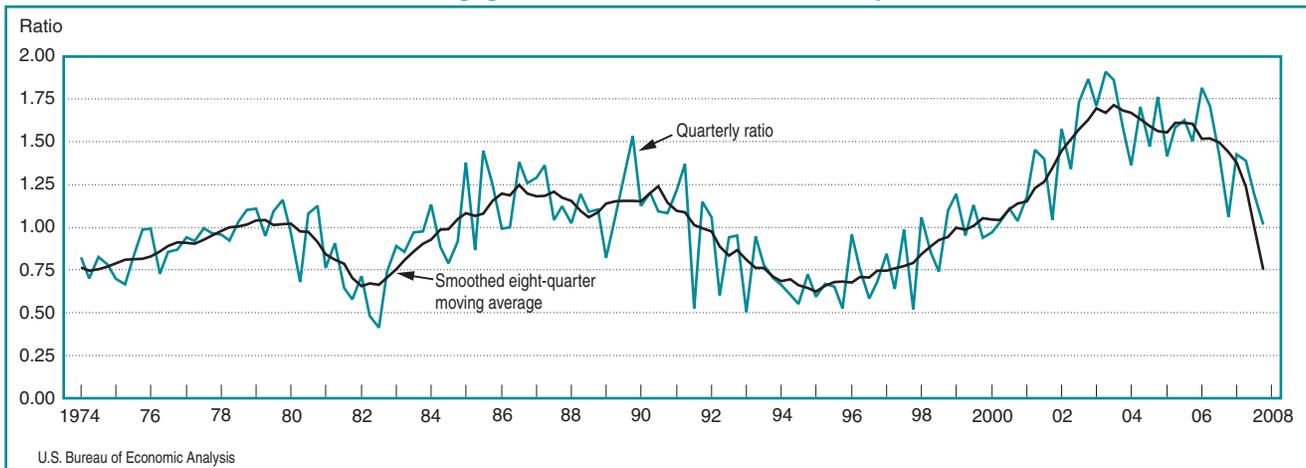
The situation in the late 1980s, however, differed from that of the early 2000s in one respect. The Tax Reform Act of 1986 phased out the deductibility of interest payments on consumer loans but maintained the deductibility of residential mortgage interest. To take advantage of the mortgage interest deduction, consumers shifted their portfolios away from consumer debt and into mortgage debt (Maki 2001). Because much of the growth of mortgage debt was due to substitution of mortgage debt for consumer debt, the overall ratio of household debt service obligations to disposable personal income and the financial obligations ratio for homeowners did not rise, even though the financial obligations ratio for mortgage debt increased from 9.3 percent in 1985 to 10.3 percent in 1991 (table 1). In contrast, between 2000 and 2007 the overall homeowner financial obligations ratio increased from 14.8 percent to 17.6 percent.

Moreover, in 2000–2007, the rise in mortgage debt-to-residential fixed investment ratio was faster and larger in magnitude than during the late 1980s. The mortgage debt-to-residential fixed investment ratio began to climb in late 2001 and recorded an unprecedented 1.91 in the second quarter of 2003. The ratio then stayed at a high level until the end of 2006. The departure of this ratio from its historical range may have signaled the substantial exposures of mortgage borrowers to house price risks.

### Financial flows between sectors before the financial crisis

The pattern of net lending or borrowing by each of the sectors in the IMAs shows which is a net provider of funds that can be used by others to finance investment in nonfinancial assets and which is a net user of funds provided by others. In the financial account, “lending”

**Chart 1. Ratio of Net Incurrence of Mortgages to Residential Gross Fixed Capital Formation, 1974–2007**



includes funding that is provided to other sectors by purchasing financial assets including equities, and “borrowing” includes funds obtained by issuing equity shares or debt or by selling assets. As noted by Eichner and others (2010), Palumbo and Parker (2010), and Vir Bhatia and Bayoumi (2012), the household sector, which is normally a supplier of funding to other sectors, underwent a striking change in roles and became a net borrower of funds in the 8 years preceding the financial crisis, while the nonfinancial corporate sector, which normally uses funds from other sectors for its investment needs, acted as a net lender in the early 2000s.

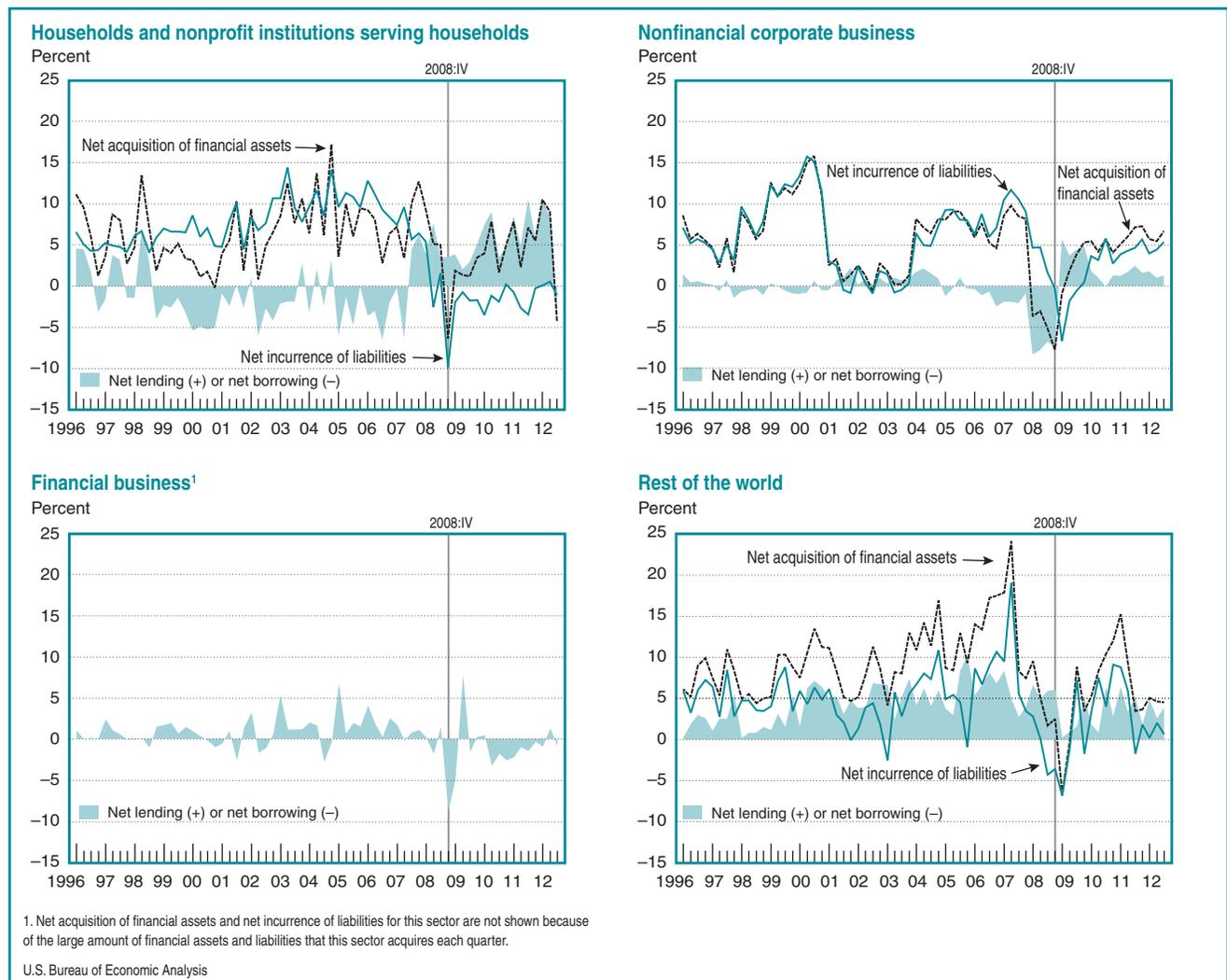
Chart 2 presents net lending and borrowing from the financial account of the IMAs for the households, nonfinancial corporate business, financial business, and rest of the world sectors from 1996 to 2012. The chart illustrates how the behavior of these sectors

changed in the years before and after the financial crisis.

The change in the role of the household sector from net lender to net borrower in the fourth quarter of 1998 is evident in the first panel of chart 2. Households become net borrowers when their saving plus their net receipts of capital transfers is lower than their investment in residential assets. IMA table S.3.a shows that households enjoyed large holding gains in most of years between 1995 and 2006, which allowed them to increase their net worth without having to save (Landefeld and others 2010). As housing prices in some parts of the country began to falter in 2006, the pace of borrowing slowed, and the household sector returned to its traditional role as a net lender in the third quarter of 2007.

The nonfinancial corporate sector increased the size of its balance sheet during the stock-market boom of

**Chart 2. Net Lending or Net Borrowing From Financial Accounts as a Percentage of National Disposable Income for Selected Sectors, 1996–2012**



the late 1990s but then sharply reduced its net incurrence of liabilities after the 2001 recession began (chart 2). The sector turned into a net lender between 2001 and 2004. In 2008, this sector drastically shed assets from its balance sheet, which made it a large net borrower in the financial account. However, the capital account estimate of the sector's net borrowing was relatively small in the first half of 2008, and in the last half of 2008, the capital account depicts the sector as a net lender. Some of the discrepancy between the financial and capital account measures of net lending may come from write-offs of assets that became uncollectable as a result of the financial crisis. Reductions in the values of assets due to writeoffs are, in effect, treated as principal repayments for purposes of measuring net lending in the financial accounts.

The financial sector and the rest of the world sector provided funds for the investment needs of the other sectors of the economy in years before the financial crisis (chart 2). However, the financial sector substantially curtailed new lending activities in the fourth quarter of 2008, when the U.S. economy was in the midst of the financial crisis. The financial sector became a net borrower in the fourth quarter of 2008, obtaining about \$1 trillion from the other sectors by means such as the issuance of equity. The financial sector became a net lender briefly in 2009 but became a net borrower again after the second quarter of 2010.

The rest of the world has been a net lender to the U.S. economy consistently since 1983. Until 1999, however, foreign net lending to the United States had rarely exceeded 3 percent of national disposable income. Since 1999, the percentage has usually been above 3 percent and even above 10 percent of national disposable income in the fourth quarter of 2006 (chart 2). Net lending by the rest of the world began to trend down in 2007, however, as the rest of the world sharply reduced its holdings of U.S. assets and liabilities. In the first quarter of 2009, net lending from the rest of the world amounted to only 0.25 percent of national disposable income. The era of high net lending to the United States by the rest of the world thus coincides with the era of net borrowing by households.

### Financial intermediation before and after the financial crisis

The financial sector performs an important role of financial intermediation by borrowing from those who have surplus funds and lending to those with a shortage of funds. In doing so, the financial sector accomplishes maturity transformation by borrowing in short-term liabilities and financing long-term assets. Data from the IMAs may illuminate how the financial sector businesses performed as financial intermediar-

ies between lenders and borrowers during the years before and after the financial crisis.

Table 2 presents the net acquisition of financial assets and net incurrence of liabilities by each sector of broad asset classes between the third quarter of 2005 and the second quarter of 2006, the height of the housing boom. This table shows that in these quarters, the financial sector concentrated on extending long-term loans (assets, line 29) to the household sector (liabilities, line 26), while the net acquisition of liquid assets (currency, deposits, money market funds (MMFs) and Treasury securities) was relatively minor (assets, line 6). Funds for long-term loans were raised through issuing bonds and equities and taking deposits (liabilities, lines 5, 37, and 45).

The rest of the world was the largest source of funding for the U.S. economy during this period. Net acquisition of corporate and government-sponsored enterprise (GSE) bonds and equity and investment by the rest of the world (assets, lines 40 and 48) accounted for more than half of total net incurrence of these liabilities. The financial sector, which was the largest issuer of corporate and GSE bonds and equities (liabilities, lines 37 and 45), in turn extended long-term loans to the household sector (assets, line 29), which were used to acquire housing assets.<sup>10</sup> The rest of the world was also the largest purchaser of U.S. Treasury securities (assets, line 16). The rest of the world, therefore, provided liquidity to the U.S. economy by acquiring various debt instruments issued by U.S. entities.<sup>11</sup>

Table 3 presents the same kind of information as table 2 for the third quarter of 2008 to the second quarter of 2009, the phase of the financial crisis when Lehman Brothers failed and AIG was rescued. If one looks at the assets side of the financial business, the lending appears unabated throughout 2008—as the financial sector extended \$3.6 trillion worth of short-term loans in the third quarter of 2008 (assets, line 21) when Lehman Brothers and Washington Mutual Bank collapsed and Fannie Mae and Freddie Mac were placed in government conservatorship. The sector further extended \$855 billion worth of short-term loans in the fourth quarter (assets, line 21).<sup>12</sup>

A large fraction of the increases in the financial

10. Long-term loans in the IMAs only account for mortgages.

11. A recent report asserts that the rest of the world, particularly European banks helped sustain the “shadow banking system” in the United States through the purchase of securitized claims on U.S. borrowers (Committee of International Economic Policy and Reform 2012).

12. Looking at the growth of bank credit and commercial and industrial loans up to October 15, 2008, Chari, Christiano, and Kehoe (2008) declare that the decline of bank lending during the financial crisis often reported in the financial press is a myth. On the other hand, Ivashina and Scharfstein (2010) argue that this increase is not driven by growth of new loans but by an increase in drawdowns on existing credit lines by corporations.

sector's net acquisition of short-term loans in this period, however, reflects loans from the Federal Reserve system. The financial business sector in the IMAs and the FFAs includes the Federal Reserve Board and regional Federal Reserve banks. Data from the FFAs show that the monetary authority extended \$2.3

**Table 2. Net Acquisition of Financial Assets and Net Incurrence of Liabilities by Asset Class,  
Third Quarter of 2005 to Second Quarter of 2006**

[Billions of current dollars]

Line	Financial instruments	Net acquisition of financial assets				Net incurrence of liabilities			
		2005		2006		2005		2006	
		III	IV	I	II	III	IV	I	II
1	<b>Currency, deposits, and money market funds</b> .....	<b>982.7</b>	<b>808.7</b>	<b>835.6</b>	<b>808.7</b>	<b>1,157.0</b>	<b>673.5</b>	<b>1,086.8</b>	<b>1,048.9</b>
2	Households and nonprofit institutions serving households .....	566.2	277.1	830.4	594.2	0.0	0.0	0.0	0.0
3	Nonfinancial noncorporate business .....	102.6	102.6	98.1	98.2	0.0	0.0	0.0	0.0
4	Nonfinancial corporate business .....	219.3	371.7	-197.1	-128.7	0.0	0.0	0.0	0.0
5	Financial business.....	116.7	53.4	71.1	210.1	990.4	868.7	881.1	749.1
6	Federal government .....	-33.3	26.8	-56.3	69.6	0.9	0.3	0.6	0.8
7	State and local governments.....	-6.5	33.1	39.5	55.6	0.0	0.0	0.0	0.0
8	Rest of the world .....	17.7	-56.0	49.9	-90.3	165.7	-195.5	205.1	299.0
9	<b>Treasury securities</b> .....	<b>235.3</b>	<b>349.1</b>	<b>331.2</b>	<b>192.4</b>	<b>235.3</b>	<b>349.0</b>	<b>331.2</b>	<b>192.3</b>
10	Households and nonprofit institutions serving households .....	-22.0	-39.4	183.6	75.6	0.0	0.0	0.0	0.0
11	Nonfinancial noncorporate business .....	6.0	6.0	0.2	0.2	0.0	0.0	0.0	0.0
12	Nonfinancial corporate business .....	-17.8	14.5	-8.4	-20.5	0.0	0.0	0.0	0.0
13	Financial business.....	-71.2	-15.8	24.1	13.5	0.0	0.0	0.0	0.0
14	Federal government .....	0.0	0.0	0.0	0.0	235.3	349.0	331.2	192.3
15	State and local governments.....	111.1	59.9	12.0	43.7	0.0	0.0	0.0	0.0
16	Rest of the world .....	229.2	323.9	119.7	79.9	0.0	0.0	0.0	0.0
17	<b>Short term loans</b> .....	<b>486.4</b>	<b>726.2</b>	<b>873.1</b>	<b>790.6</b>	<b>407.0</b>	<b>653.7</b>	<b>1,117.2</b>	<b>980.2</b>
18	Households and nonprofit institutions serving households .....	-16.9	-8.7	93.4	191.2	49.7	-7.8	180.8	96.2
19	Nonfinancial noncorporate business .....	0.0	0.0	0.0	0.0	171.8	178.6	133.4	134.4
20	Nonfinancial corporate business .....	12.7	4.4	-2.7	-8.0	-42.1	141.7	172.1	171.5
21	Financial business.....	296.0	586.9	672.4	574.7	227.9	301.8	634.7	554.3
22	Federal government .....	3.7	0.0	1.2	6.1	0.0	0.0	0.0	0.0
23	State and local governments.....	-1.2	-2.3	-0.4	3.0	1.0	0.8	0.3	0.9
24	Rest of the world .....	192.1	145.9	109.2	23.6	-1.3	38.6	-4.1	22.9
25	<b>Long term loans (mortgages)</b> .....	<b>1,548.0</b>	<b>1,538.0</b>	<b>1,720.4</b>	<b>1,531.4</b>	<b>1,548.0</b>	<b>1,538.1</b>	<b>1,720.4</b>	<b>1,531.3</b>
26	Households and nonprofit institutions serving households .....	7.2	1.7	-9.7	-18.2	1,135.6	1,070.3	1,299.8	1,179.3
27	Nonfinancial noncorporate business .....	5.3	5.3	-1.5	-1.5	177.6	177.9	283.0	283.3
28	Nonfinancial corporate business .....	1.7	1.7	-8.3	-8.4	219.7	293.4	121.0	53.0
29	Financial business.....	1,523.2	1,519.7	1,730.4	1,540.3	15.1	-3.5	16.6	15.7
30	Federal government .....	3.8	4.0	1.8	6.9	0.0	0.0	0.0	0.0
31	State and local governments.....	6.8	5.6	7.7	12.3	0.0	0.0	0.0	0.0
32	Rest of the world .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	<b>Corporate and government-sponsored enterprise bonds</b> .....	<b>526.2</b>	<b>1,369.8</b>	<b>1,524.3</b>	<b>1,639.7</b>	<b>526.0</b>	<b>1,369.7</b>	<b>1,524.3</b>	<b>1,639.7</b>
34	Households and nonprofit institutions serving households .....	101.4	578.4	34.5	34.9	0.0	0.0	0.0	0.0
35	Nonfinancial noncorporate business .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	Nonfinancial corporate business .....	-5.9	4.8	-2.8	-6.8	95.7	66.6	202.3	191.7
37	Financial business.....	-116.1	206.0	887.7	769.8	370.9	1,267.3	1,190.1	1,214.4
38	Federal government .....	0.0	0.0	0.0	0.0	-0.4	0.8	-1.0	0.2
39	State and local governments.....	20.0	15.9	23.4	38.8	0.0	0.0	0.0	0.0
40	Rest of the world .....	526.8	564.7	581.5	803.0	59.8	35.0	132.9	233.4
41	<b>Equity and investment</b> .....	<b>218.5</b>	<b>357.6</b>	<b>864.7</b>	<b>519.4</b>	<b>218.4</b>	<b>357.3</b>	<b>864.8</b>	<b>519.5</b>
42	Households and nonprofit institutions serving households .....	-336.6	-268.0	-404.3	-429.0	0.0	0.0	0.0	0.0
43	Nonfinancial noncorporate business .....	0.3	0.0	0.0	0.1	-29.3	3.5	79.8	63.3
44	Nonfinancial corporate business .....	-60.6	-211.7	280.9	168.4	-293.2	-214.4	-412.8	-331.1
45	Financial business.....	349.0	560.5	569.4	406.9	400.8	527.1	757.0	488.1
46	Federal government .....	1.2	1.0	5.2	0.6	0.0	0.0	0.0	0.0
47	State and local governments.....	-14.9	-8.2	-22.0	16.8	0.0	0.0	0.0	0.0
48	Rest of the world .....	280.1	284.0	435.5	355.6	140.1	41.1	440.8	299.2
49	<b>Other</b> .....	<b>2,504.8</b>	<b>1,731.2</b>	<b>2,733.6</b>	<b>2,761.2</b>	<b>2,120.6</b>	<b>1,278.1</b>	<b>2,123.4</b>	<b>2,129.7</b>
50	Households and nonprofit institutions serving households .....	383.4	539.8	354.8	514.2	32.7	30.4	23.1	47.2
51	Nonfinancial noncorporate business .....	323.2	323.5	422.9	423.1	196.0	201.8	164.0	168.0
52	Nonfinancial corporate business .....	872.7	698.5	636.9	913.7	928.5	629.9	658.4	953.4
53	Financial business.....	688.4	354.3	981.6	528.4	556.4	123.2	975.6	799.4
54	Federal government .....	14.2	46.2	17.4	-9.2	87.3	172.0	23.7	64.9
55	State and local governments.....	10.8	-34.7	-30.3	-25.4	171.6	142.8	40.8	152.4
56	Rest of the world .....	212.1	-196.4	350.3	416.4	148.1	-22.0	237.8	-55.6

trillion and \$2.9 trillion worth of short-term loans in the third and fourth quarters of 2008, respectively, which included \$1.3 trillion of commercial paper pur-

chased through the Commercial Paper Funding Facility in the fourth quarter of 2008. Therefore, an increase of net acquisition of short-term loans of only \$855

**Table 3. Net Acquisition of Financial Assets and Net Incurrence of Liabilities by Asset Class,  
Third Quarter of 2008 to Second Quarter of 2009**

[Billions of current dollars]

Line	Financial instruments	Net acquisition of financial assets				Net incurrence of liabilities			
		2008		2009		2008		2009	
		III	IV	I	II	III	IV	I	II
1	<b>Currency, deposits, and money market funds</b> .....	<b>3,362.6</b>	<b>5,798.5</b>	<b>-961.8</b>	<b>-1,060.1</b>	<b>3,031.1</b>	<b>5,989.2</b>	<b>-1,005.7</b>	<b>-1,125.4</b>
2	Households and nonprofit institutions serving households.....	740.5	750.8	98.5	92.4	0.0	0.0	0.0	0.0
3	Nonfinancial noncorporate business.....	3.5	3.5	14.0	13.9	0.0	0.0	0.0	0.0
4	Nonfinancial corporate business.....	-98.0	-112.0	93.7	-73.4	0.0	0.0	0.0	0.0
5	Financial business .....	964.6	3,143.8	-128.4	-596.6	3,422.5	6,349.1	-758.1	-1,038.1
6	Federal government.....	1,260.6	41.8	-334.3	119.9	-1.2	-0.8	0.0	0.0
7	State and local governments .....	0.0	56.3	44.5	117.2	0.0	0.0	0.0	0.0
8	Rest of the world.....	491.4	1,914.3	-749.8	-733.5	-390.2	-359.1	-247.6	-87.3
9	<b>Treasury securities</b> .....	<b>1,923.4</b>	<b>2,185.0</b>	<b>1,630.8</b>	<b>1,837.5</b>	<b>1,923.4</b>	<b>2,185.0</b>	<b>1,630.9</b>	<b>1,837.6</b>
10	Households and nonprofit institutions serving households.....	-16.5	233.3	615.8	275.3	0.0	0.0	0.0	0.0
11	Nonfinancial noncorporate business.....	-7.5	-7.5	-5.7	-5.7	0.0	0.0	0.0	0.0
12	Nonfinancial corporate business.....	-13.2	19.8	42.6	3.1	0.0	0.0	0.0	0.0
13	Financial business .....	1,160.1	983.7	84.2	996.5	0.0	0.0	0.0	0.0
14	Federal government.....	0.0	0.0	0.0	0.0	1,923.4	2,185.0	1,630.9	1,837.6
15	State and local governments .....	-91.8	-83.5	111.6	-12.1	0.0	0.0	0.0	0.0
16	Rest of the world.....	892.3	1,039.2	782.3	580.4	0.0	0.0	0.0	0.0
17	<b>Short term loans</b> .....	<b>3,307.7</b>	<b>-423.8</b>	<b>-3,390.4</b>	<b>-3,641.0</b>	<b>2,571.9</b>	<b>-1,284.4</b>	<b>-3,725.2</b>	<b>-2,193.6</b>
18	Households and nonprofit institutions serving households.....	50.2	-1,021.9	-314.7	-43.5	435.9	-967.7	-269.9	67.5
19	Nonfinancial noncorporate business.....	0.0	0.0	0.0	0.0	100.9	110.7	-55.0	-122.4
20	Nonfinancial corporate business.....	-43.2	8.2	17.3	5.5	236.2	-173.3	-452.7	-352.1
21	Financial business .....	3,617.1	855.4	-2,786.0	-3,596.9	872.1	-1,288.3	-1,952.1	-1,001.0
22	Federal government.....	3.1	35.2	99.1	164.2	0.0	0.0	0.0	0.0
23	State and local governments .....	-27.4	-20.7	-11.6	-1.6	1.1	1.0	0.6	0.8
24	Rest of the world.....	-292.1	-280.0	-394.5	-168.7	925.7	1,033.2	-996.1	-786.4
25	<b>Long term loans (mortgages)</b> .....	<b>-168.7</b>	<b>-217.4</b>	<b>-18.7</b>	<b>-250.6</b>	<b>-168.6</b>	<b>-217.3</b>	<b>-18.8</b>	<b>-250.6</b>
26	Households and nonprofit institutions serving households.....	-9.4	-7.7	-8.2	-9.1	-248.5	-260.7	19.5	-176.2
27	Nonfinancial noncorporate business.....	-3.0	-3.0	-1.2	-1.2	186.7	186.7	-7.3	-14.7
28	Nonfinancial corporate business.....	-7.8	-7.8	-4.0	-4.1	-112.7	-146.7	-36.6	-69.2
29	Financial business .....	-127.6	-207.3	-1.9	-265.4	5.9	3.4	5.6	9.5
30	Federal government.....	12.1	27.8	3.6	21.8	0.0	0.0	0.0	0.0
31	State and local governments .....	-33.0	-19.4	-7.0	7.4	0.0	0.0	0.0	0.0
32	Rest of the world.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	<b>Corporate and government-sponsored enterprise bonds</b> .....	<b>-175.6</b>	<b>-228.9</b>	<b>277.6</b>	<b>-197.5</b>	<b>-173.8</b>	<b>-229.9</b>	<b>280.7</b>	<b>-196.5</b>
34	Households and nonprofit institutions serving households.....	411.2	-273.3	-643.1	-1,295.3	0.0	0.0	0.0	0.0
35	Nonfinancial noncorporate business.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	Nonfinancial corporate business.....	-4.4	6.6	-1.8	17.0	92.9	184.3	590.6	399.9
37	Financial business .....	172.7	709.5	1,163.2	1,228.7	100.4	-201.0	-458.4	-832.1
38	Federal government.....	13.2	204.5	209.1	176.1	0.0	0.0	0.0	0.0
39	State and local governments .....	-114.3	-69.4	-27.0	-37.9	0.0	0.0	0.0	0.0
40	Rest of the world.....	-654.0	-806.8	-422.8	-286.1	-367.1	-213.2	148.5	235.7
41	<b>Equity and investment</b> .....	<b>-389.0</b>	<b>1,702.9</b>	<b>539.4</b>	<b>1,285.9</b>	<b>-389.1</b>	<b>1,702.9</b>	<b>539.2</b>	<b>1,285.9</b>
42	Households and nonprofit institutions serving households.....	-488.5	-767.7	287.0	842.0	0.0	0.0	0.0	0.0
43	Nonfinancial noncorporate business.....	0.8	1.1	-2.3	0.5	-287.3	-270.8	-53.4	4.9
44	Nonfinancial corporate business.....	194.8	173.2	260.4	229.1	-218.6	-130.2	-127.2	184.2
45	Financial business .....	-389.5	873.9	-336.9	18.4	40.4	1,870.6	453.8	633.7
46	Federal government.....	0.5	1,025.7	364.2	-122.7	0.0	0.0	0.0	0.0
47	State and local governments .....	15.5	15.6	-65.4	16.8	0.0	0.0	0.0	0.0
48	Rest of the world.....	277.4	381.1	32.4	301.8	76.4	233.3	266.0	463.1
49	<b>Other</b> .....	<b>-1,861.1</b>	<b>-3,083.9</b>	<b>-984.1</b>	<b>141.2</b>	<b>-246.3</b>	<b>-292.2</b>	<b>237.7</b>	<b>-1,358.7</b>
50	Households and nonprofit institutions serving households.....	-52.1	312.0	190.9	299.2	9.7	26.7	15.9	24.3
51	Nonfinancial noncorporate business.....	103.3	103.0	-105.5	-108.4	139.9	123.1	30.4	32.5
52	Nonfinancial corporate business.....	-666.8	-1,026.6	-516.5	49.1	216.7	229.4	-769.0	-374.0
53	Financial business .....	-750.5	-350.9	-340.9	-376.9	17.8	335.8	941.7	-1,289.4
54	Federal government.....	-119.2	-97.6	-27.1	66.0	92.4	107.7	-101.5	15.5
55	State and local governments .....	127.2	-77.7	-147.9	-77.9	56.9	14.4	110.8	181.0
56	Rest of the world.....	-503.0	-1,946.1	-37.1	290.1	-779.7	-1,129.3	9.4	51.4

billion in the fourth quarter of 2008, despite the Federal Reserve's infusion of liquidity into the short-term funding markets, implies that the private-sector financial businesses reduced its short-term lending. At the same time, the financial sector reduced its exposure in long-term loans.

In addition, it is insufficient to look solely at the assets side of the financial sector's balance sheet. During the fourth quarter of 2008, the household and NPISH sector shifted their portfolio from risky assets, such as bonds and equity, to safer assets, such as deposits and Treasury securities (assets, lines 2, 34, and 42). To accommodate this shift, the financial sector incurred \$6.3 trillion worth of liabilities in currency, deposits, and MMFs (liabilities, line 5).<sup>13</sup> Of the net incurrence of liabilities in the form of currency, deposits, and MMFs, nearly two-thirds were kept in the form of instruments that were relatively safe for the creditor (\$3.1 trillion in currency, deposits, and MMFs and \$984 billion in Treasury securities) (assets, lines 5 and 13). The shift to safer assets combined with the reduction in long-term loans turned the financial sector into a net borrower in 2008 rather than providing financing to the other sectors of the economy.

Despite the \$855 billion increase in short-term lending by the financial sector in the fourth quarter of 2008 (assets, line 21), there is not a corresponding rise in short-term liabilities for the domestic nonfinancial sectors (liabilities, lines 18–20). On the contrary, the household sector and nonfinancial corporate sector reduced their borrowings in short-term loans; rather, the short-term loans in the fourth quarter of 2008 were extended not to the domestic sectors but to nonresidents. The rest of the world incurred short-term liabilities of \$1,033 billion in the fourth quarter of 2008 (liabilities, line 24). The funds that left the United States in the form of short-term loans came back as the rest of the world acquired \$1,039 billion worth of Treasury securities (assets, line 16). The United States thus provided liquidity for the rest of the world through its financial sector during the time of crisis, which in turn returned to the United States as foreign central banks and investors sought a safe haven for their investment. The U.S. provision of liquidity to the rest of the world during the financial crisis is a reversal of roles from the boom years.

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13. The Federal Reserve's net incurrence of liabilities in currency and deposits was \$2.8 trillion in the fourth quarter of 2008.

### Household balance sheets and aggregate activities

The recent financial crisis has revived academic researchers' interest in the role of balance sheets in consumption decisions of households (Mian and Sufi 2010; Dynan 2012; Mian and others 2012). Data from the IMAs can be used to analyze relationships between the household balance sheet and key economic variables.

Chart 3 illustrates how changes in the net worth-to-disposable income ratio relate to the growth rate of private-sector demand. The two upper panels display the relationship between the changes in the net worth-to-disposable income ratio over the preceding four quarters and the growth rates of durable-goods consumption and consumption of nondurable goods and services from the NIPAs for 1961–2012. The lower two panels show the relationship with private nonresidential and residential fixed investment. Dots are connected from the fourth quarter of 2007 to the fourth quarter of 2009 to underscore the relationships between the variables during the recent recession.

The changes in the net worth-to-disposable income ratio coincide most strongly with growth of durable-goods consumption. Consumption of nondurable goods and services continued to grow between the fourth quarter of 2007 and the second quarter of 2008 even when the net worth-to-disposable income ratio declined substantially. The decline in business fixed investment does not seem related to the contraction of the household balance sheet. The growth rate of private residential fixed investment and changes in the net worth-to-disposable income ratio seem correlated over the long run. However, residential fixed investment had been hit hard and decreasing even before the start of the recession. As the housing industry adjusted its inventories after 2007, the changes in the net worth-to-disposable income ratio appear only mildly related to growth of residential fixed investment. These charts support findings that the change in the household balance sheet mainly works through its impact on durable-goods consumption (Mian and Sufi 2010).

Holding disposable income constant, the net worth-to-disposable income ratio would decrease either because households sell off assets or incur more liabilities or because the value of assets falls. Do changes in the net worth-to-disposable income ratio between 2007 and 2009 and associated changes in the growth rate of durable-goods consumption reflect the household

sector's active saving decisions? Or is the decline in durable-goods consumption related to a loss of the market value of household wealth?

To address these questions, the top left panel of chart 4 plots the growth rate of durable-goods consumption against the changes in the net worth-to-disposable income ratio attributable to holding gains and losses of the household sector for 1961–2012. As before, the dots are connected from the fourth quarter of 2007 to the fourth quarter of 2009. The negative

growth of durable-goods consumption after the onset of the recession in the fourth quarter of 2007 is related to a decrease in the net worth-to-disposable income ratio attributable to holding losses. However, the changes in this ratio due to other factors (sum of net saving, capital transfers, and other volume changes) display no clear correlation with the growth of durable-goods consumption.

Economists have been interested in whether or not the “wealth effects,” namely the links between changes

**Chart 3. Changes in the Household Sector's Ratio of Net Worth to Disposable Income and Private-Sector Demand, 1961–2012**



in household wealth and consumer spending, are similar for housing wealth and for financial wealth (for example, Juster and others 2006 and Case and others 2013). The lower left panel of chart 4 plots the growth rate of durable-goods consumption against the changes in the net worth-to-disposable income ratio related to real estate holding gains, and the lower right panel illustrates the relationship between the durable-

goods consumption and holding gains from financial assets. Losses of market values of both real estate and financial assets coincide with a contraction of durable-goods consumption. However, for a 1 point change in the net worth-to-disposable income ratio, holding losses from real estate assets are related to a steeper decline in the growth rate of durable-goods consumption.

**Chart 4. Changes in the Household Sector's Ratio of Net Worth to Disposable Income and Durable-Goods Consumption, 1961–2012**



## Conclusions

BEA and the FRB continue to improve the IMAs. BEA's strategic plan includes a number of research activities that will result in enhancements in the quality of NIPA-based measures. In July 2013, BEA will release the initial results of the comprehensive revision of the NIPAs. In March 2013, an article in the *SURVEY* offered a preview, discussing planned changes in definitions and presentations (Bureau of Economic Analysis 2013). The comprehensive revision will include several enhancements, including capitalization of research and development, capitalization of artistic originals, a change to accrual accounting of pensions, and improvements to output measures of financial services.

In conjunction with BEA's shift to accrual accounting for pensions, the FRB will record pension entitlements as an asset on the household balance sheet. In addition, claims of pension funds (part of the financial corporation sector) on their sponsors will be recorded as an asset in the federal, state and local, and private pension fund sectors, with a corresponding liability for the federal government, state and local government, and nonfinancial corporation sectors. This will allow the user of the accounts to see the overfunding or underfunding of the pension plans in the United States. These revisions will ensure more accurate representation of the U.S. economy in the current account, the capital account, and the balance sheets.

One of the potential areas of improvement relates to the identification of debt write-downs. In the financial accounts, debt write-downs are included in net lending/net borrowing. In the NIPAs, however, write-downs are not part of net lending or borrowing as they are not part of saving or investment in the current period. Removing debt write-downs from the financial account and placing them under the "other volume changes" account would improve our understanding of fund flows between sectors and would result in a reduction in the discrepancies between the measure of the net lending or net borrowing between the capital account and the financial account.

Another challenge is to divide the financial business

into subsectors. After the recent financial crisis, G-20 governments established the G20 Data Gaps Initiative to improve global financial statistics. The initiative recommends the balance sheet approach and detailed sectoral data for financial statistics, which the IMAs would be able to address. In response to the recommendation, Cagetti and others (2012) show a prototype of accounts for three subsectors: the central bank, insurance and pension funds, and other financial business. BEA and the FRB hope to roll out these three financial subsectors in the future.

The next challenge is to split the other financial business subsector further, preferably to separately identify depository institutions as their own subsector within financial business. This division would be important in understanding the business of the financial sector because depository institutions and non-bank financial institutions seem to play different roles in propagation of the business cycle. For example, security brokers and dealers increase their leverage when the asset values grow while depository institutions keep the leverage constant in the face of asset price fluctuations (Adrian and Shin 2010). Co-movements of asset values and financial leverage tend to magnify the business cycle as a decline of asset prices would lead security and brokerage firms to reduce leverage by selling securities and reducing lending. Separating other financial institutions from depository institutions would advance our understanding of distinct roles that different financial institutions may play over the business cycle.

Several other areas for improvement are listed in Cagetti and others (2012). Future improvements may include identifying structured financial products from conventional debt instruments, separating the NPISH from the household sector, and including real estate values into the balance sheets of the financial and government sectors. Challenges abound on the road ahead, but BEA and the FRB will continue to work together to make these improvements available to users of the IMAs.

## References

- Adrian, Tobias, and Hyun Song Shin. 2010. "Liquidity and Leverage." *Journal of Financial Intermediation* 19, no. 3 (July): 418–437.
- Bond, Charlotte Anne, Teran Martin, Susan Hume McIntosh, and Charles Ian Mead. 2007. "Integrated Macroeconomic Accounts for the United States." *SURVEY OF CURRENT BUSINESS* 87 (February): 14–24.
- Bureau of Economic Analysis. 2013. "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts: Changes in Definitions and Presentations." *SURVEY OF CURRENT BUSINESS* 93 (March): 13–39.
- Cagetti, Marco, Elizabeth Ball Holmquist, Lisa Lynn, Susan Hume McIntosh, and David Wasshausen. 2012. "The Integrated Macroeconomic Accounts of the United States." Paper presented at the 32<sup>nd</sup> General Conference of the International Association for Research in Income and Wealth, Boston, August 5–12; [www.iariw.org/c2012.php](http://www.iariw.org/c2012.php).
- Case, Karl, John M. Quigley, and Robert J. Shiller. 2013. "Wealth Effects Revisited: 1975–2012." NBER Working Paper No. 18667. Cambridge, MA: National Bureau of Economic Research (NBER).
- Chari, V. V., Lawrence Christiano, and Patrick J. Kehoe. 2008. "Facts and Myths about the Financial Crisis of 2008." Federal Reserve Bank of Minneapolis Working Paper 666. Minneapolis, MN, October.
- Committee on International Economic Policy and Reform. 2012. *Banks and Cross-Border Capital Flows: Policy Challenges and Regulatory Responses*. Washington, DC: Brookings Institution, September; [www.brookings.edu/events/2012/09/26-capital-flows](http://www.brookings.edu/events/2012/09/26-capital-flows).
- Dynan, Karen E. 2012. "Is a Household Debt Overhang Holding Back Consumption?" *Brookings Papers on Economic Activity* (Spring): 299–351.
- Eichner, Matthew J., Donald L. Kohn, and Michael G. Palumbo. 2010. "Financial Statistics for the United States and the Crisis: What Did They Get Right, What Did They Miss, and How Should They Change?" Finance and Economics Discussion Series 2010–20. Washington, DC: Federal Reserve Board of Governors.
- European Commission, International Monetary Fund, Organization for Economic Co-operation and Development, United Nations, and World Bank. 2009. *System of National Accounts 2008*. New York, NY: United Nations.
- Fridson, Martin, and Fernando Alvarez. 2011. *Financial Statement Analysis: A Practitioner's Guide*, 4<sup>th</sup> edition. New York, NY: John Wiley and Sons.
- Geanakoplos, John. 2010. "Solving the Present Crisis and Managing the Leverage Cycle." *Economic Policy Review* 16, no. 1 (August): 101–131.
- Ivashina, Victoria, and David Scharfstein. 2010. "Bank Lending During the Financial Crisis of 2008." *Journal of Financial Economics* 97, no. 3 (September): 319–338.
- Jorgenson, Dale W., and J. Steven Landefeld. 2006. "Blueprint for Expanded and Integrated U.S. Accounts: Review, Assessment, and Next Steps." In *A New Architecture for the U.S. National Accounts*, edited by Dale W. Jorgenson, J. Steven Landefeld, and William D. Nordhaus, 13–112. Chicago: University of Chicago Press, for the National Bureau of Economic Research.
- Juster, F. Thomas, Joseph P. Lupton, James P. Smith, and Frank Stafford. 2006. "The Decline in Household Saving and the Wealth Effect." *Review of Economics and Statistics* 88, no. 1 (February): 20–27.
- Landefeld, J. Steven, Brent R. Moulton, Joel D. Platt, and Shaunda M. Villones. 2010. "GDP and Beyond: Measuring Economic Progress and Sustainability." *SURVEY OF CURRENT BUSINESS* 90 (April): 12–25.
- Maki, Dean M. 2001. "Household Debt and the Tax Reform Act of 1986." *American Economic Review* 91, no. 1 (March): 305–319.
- Mian, Atif, and Amir Sufi. 2010. "Household Leverage and the Recession of 2007–2009." *IMF Economic Review* 58, no. 1 (April): 74–116.
- Mian, Atif, Kamalesh Rao, and Amir Sufi. 2012. "Household Balance Sheets, Consumption, and the Economic Slump." Unpublished Working Paper. Chicago, IL: University of Chicago Booth School of Business.
- Palumbo, Michael G., and Jonathan A. Parker. 2009. "The Integrated Financial and Real System of National Accounts for the United States: Does it Presage the Financial Crisis?" *American Economic Review* 99, no. 2 (May): 80–86.
- Teplin, Albert M., Rochelle Antoniewicz, Susan Hume McIntosh, Michael G. Palumbo, Genevieve Solomon, Charles Ian Mead, Karin Moses, and Brent Moulton. 2006. "Integrated Macroeconomic Accounts for the United States: Draft SNA-USA." In *A New Architecture for the U.S. National Accounts*, edited by Dale W. Jorgenson, J. Steven Landefeld, and William D. Nordhaus, 13–112. Chicago: University of Chicago Press, for the National Bureau of Economic Research.
- Vir Bhatia, Ashok, and Tamin Bayoumi. 2012. "Leverage? What Leverage? A Deep Dive into the U.S. Flow of Funds in Search of Clues to the Global Crisis." IMF Working Paper WP/12/162. Washington, DC: International Monetary Fund.