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Analysis of Wealth Using Micro- and Macrodata

A Comparison of the Survey of Consumer Finances and Flow of Funds Accounts

Alice M. Henriques and Joanne W. Hsu

9.1 Introduction

Household balance sheets are key inputs into macroeconomic analysis and forecasting, and thus the Federal Reserve Board allocates substantial resources toward two major data products that are used to independently generate estimates of household net worth over time. The Federal Reserve Board is responsible for the most widely used macrolevel estimates of US household sector net worth, generated as part of the quarterly Flow of Fund Accounts (FFA).¹ The Federal Reserve Board is also responsible for the microlevel Survey of Consumer Finances (SCF), used extensively to study household behavior.² Previous studies have looked at the relationship between SCF and FFA aggregate net worth over time. See, in particular, Avery and Kennickell (1991), Avery, Elliehausen, and Kennickell (1988), Curtin, Juster, and Morgan (1989), and Antoniewicz (2000).

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1. The FFA data are available for download at <http://www.federalreserve.gov/releases/z1>.

2. Results of the most recent SCF, conducted in 2010, are discussed in Bricker et al. (2012). The SCF microdata are available for download or online tabulation and analysis at <http://www.federalreserve.gov/econresdata/scf/scfindex.htm>. Longer term trends in wealth on the SCF are discussed in Wolff (2011, 1998) and Kennickell (2011).

In light of more recent economic developments, we revisit trends in household wealth using these two data sources to better understand how households have fared. Despite substantial differences in the goals and methods used to produce the two measures of household net worth, the patterns of aggregate household wealth change over the past twenty-five years are similar. The differences that do exist in a few subcomponents of the household balance sheet—such as owner-occupied housing, noncorporate equity, and credit cards—are attributable to methodological differences made in the production of the data. These differences do not fundamentally alter the pattern of household wealth changes leading up to and following the Great Recession.

Macro- and microwealth data are used to answer different types of questions about life cycle saving and wealth accumulation. Macrowealth data from the FFA, drawn primarily from various administrative sources, are often used in conjunction with macroincome and macroconsumption data to study household-sector saving and spending over time.³ One might ask, for example, whether the dramatic decline in aggregate personal consumption expenditures during the Great Recession and subsequent slow growth have been unusual, given what happened to aggregate household wealth and income.⁴ This sort of aggregate time-series analysis leads to estimates of key macroeconomic forecasting parameters, such as the marginal effect of wealth change or the effects of permanent and transitory income shocks on personal consumption expenditures. Answering such questions requires high-frequency, timely, and comprehensive data of the sort provided by the FFA.

The drawback to using macrodata is that the aggregate behavior of the household sector is modeled as though households are a monolithic entity, rather than generated by summing the behavior across the millions of households actually making the spending and saving decisions.⁵ In a world of perfect household data (a world where this chapter would never have to be written) the macrowealth data would be aggregated from household-level wealth data, and that underlying household-level data would also have the key income, demographic, socioeconomic, labor force, credit market experiences, and expectation attributes of the individual households that theory tells us should affect their saving and spending decisions. Microdata is desirable for studying behavior both because households differ in terms of these underlying characteristics, but also because any given set of changes to the macroeconomic environment will have differential effects across households, depending on their initial conditions.⁶

3. For example, see Wilson et al. (1989).

4. This issue has been addressed in a number of papers. See, for example, Lettau and Ludvigson (2004).

5. One exception is Maki and Palumbo (2001), who use the SCF to provide evidence of heterogeneity inherent in the FFA values.

6. See, for example, De Nardi, French, and Benson (2012) and Petev, Pistaferri, and Eksten (2011).

The SCF is a widely used microdata set for studying saving and wealth accumulation behavior across different types of households. The popularity of the SCF among economic researchers is attributable to a unique sampling and data production strategy, and because the SCF collects both comprehensive balance sheet data and the extensive income, demographic, and other supplemental information that researchers want.⁷ The SCF data have been used in several different ways for studying basic life cycle saving and wealth accumulation behavior. For example, one important use of the SCF is to calibrate structural life cycle models. Given income dynamics, realistic budget constraints, and assumptions about utility functions, deep parameters, and intertemporal optimizing behavior, one can solve for the predicted net worth outcomes of different types of households in different situations and then compare those predictions to actual outcomes in the SCF.⁸ A second example of how the SCF has been used to study life cycle behavior is the so-called “synthetic cohort” approach, where observations are grouped within the independent cross sections in such a way as to make it possible to measure wealth changes for those groups between survey waves.⁹

The SCF has much of the household-level balance sheet and other information that researchers desire for studying saving and wealth accumulation behavior, but the primary drawbacks are the triennial frequency, the lag between data collection and data release, and the relatively small sample sizes.¹⁰ These limitations arise because the SCF is a complicated household survey, and (like every data collection effort) faces a budget constraint. Conducting and processing the data from even a few thousand household interviews is a substantial undertaking, and survey resources are allocated to balance competing objectives of data quality, frequency, and timeliness.

The FFA data are collected in a very different way and with different goals in mind, and thus there is a different set of tradeoffs. To a large extent, the

7. The sampling strategy of the SCF involves combining a standard area-probability sample with a special “list” sample of (probabilistically) high-wealth households. The list sample is chosen based on statistical records derived from income tax returns. Other household surveys that collect measures of household net worth, such as the Survey of Income and Program Participation (SIPP), Panel Survey of Income Dynamics (PSID), and Health and Retirement Study (HRS), generally find wealth levels comparable to the SCF for much of the wealth distribution, but they fall far short for the wealthiest households. Given the high concentration of wealth, this also means those other microdata sets fall well short of producing aggregate net worth estimates that would match estimates of aggregate household net worth generated by the FFA.

8. See, for example, Hubbard, Skinner, and Zeldes (1994). Browning and Lusardi (1996) provide an extensive overview of how different types of microdata have been used to study saving and wealth accumulation in different ways.

9. See, for example, Gale and Pence (2006) and Sabelhaus and Pence (1999).

10. Another potential drawback is that the SCF has been almost exclusively a cross section since 1989, with the one exception being a 2009 reinterview of 2007 respondents that the Federal Reserve Board undertook in order to study the financial effects of the Great Recession; see Bricker et al. (2011). Bosworth (2012) shows that measuring saving (and thus consumption, solved for by subtracting saving from income) by first-differencing wealth levels in the PSID is extremely problematic and probably uninformative. Rather than relying on measured wealth changes, Dynan (2012) uses the direct expenditure estimates now being collected by the PSID to study the effect of housing wealth on consumption.

FFA are based on data found in aggregate government reports and filings that provide comprehensive coverage of sectors or entities. For example, Call Reports provide the source data for banks, and regulatory filings with the Securities and Exchange Commission are source data for brokers, dealers, money market mutual funds, and government-sponsored enterprises. Other key government sources of data for the FFA are obtained from agencies including the Bureau of Economic Analysis (BEA), the Census Bureau, and the Internal Revenue Service (IRS). In addition, the FFA use trade association data. For example, data from the Investment Company Institute (ICI) are used to compile balance sheets for the mutual fund sector. Other data are provided by private vendors.

A heavy reliance on government filings works very well when estimating the size of some sectors. However, quarterly data are not available for households. Many components of the FFA's balance sheet for the household sector, found in table B.100, are estimated as residuals. These residuals are derived by estimating the economy-wide total, and removing the estimated values of all other sectors, which results in the value of the last remaining sector, households. Components estimated in this manner include households' holdings of checkable deposits and currency, time and savings deposits, bonds, and mutual funds.

High-quality data do not exist to estimate a balance sheet for nonprofit organizations; thus, by default, they are included in the household sector.¹¹ In addition, some entities, such as domestic hedge funds and some privately held trusts, for which virtually no comprehensive source data are available, are also partially included in the household sector's residual calculations. The FFA historical series are frequently revised when source data themselves are revised, when new data are available, and when Federal Reserve Board staff change their methodology. Despite the very different approaches to estimating household net worth, the two data sets show the same general patterns of saving and wealth accumulation over the past twenty-five years. Levels of net worth are nearly identical in the period 1989 to 1998. Beginning in 2001, and through 2010, the SCF estimates of net worth exceed the FFA estimates by approximately 20 percent. The gap that emerged in the early twenty-first century is a combination of higher values for tangible assets in the SCF, in particular noncorporate business equity and owner-occupied housing, and larger values of liabilities in the FFA, especially for consumer credit.

These areas of divergence between the SCF and FFA in aggregate owner-occupied housing, noncorporate business, and credit card balances appear to be largely attributable to methodological differences in the production of the data, but they do not dramatically alter one's perceptions of household

11. The FFA previously reported a separate accounting for the financial assets and liabilities of most nonprofit organizations in supplementary table L.100.a, but this series was discontinued in 2000 due to source data quality concerns. The annual average of the total financial assets of nonprofit organizations reported in L.100.a was 1.2 trillion dollars.

net worth changes leading up to and following the Great Recession (see tables 9.1 and 9.2). The most prominent aggregate trend in household wealth of the past decade or so is the boom and bust in owner-occupied housing. The aggregate values of owner-occupied housing in the FFA and SCF were nearly identical in 1995. Between 1995 and 2007, the FFA value increased nearly 170 percent, while the SCF value increased nearly 250 percent. Between 2007 and 2010, the FFA value fell 22 percent, while the SCF value fell 17 percent. The boom and bust in housing is clearly evident in both data sets, but the more dramatic boom and slightly less dramatic bust has left the SCF value some 40 percent higher than that in the FFA as of 2010. This pattern is unsurprising given methodological differences between the two estimates, and it is not immediately clear how these differences should be interpreted. A comprehensive explanation of why these differences exist is beyond the scope of this chapter.

According to responses to the SCF, noncorporate businesses are the tangible asset held by the fewest households, and the distribution of business values is extremely skewed. Differences in the valuation methods used by the SCF and FFA, along with a high degree of sampling variability because of the skewed distribution of owned business values possessed in the survey, combine to generate a volatile measure in which SCF business values typically exceed those in the FFA. However, as with owner-occupied housing, the general pattern of boom and bust in recent years is evident in both data sets.

Another example of apparent divergence between the SCF and FFA is in the category of consumer credit outstanding, especially credit card balances.¹² The SCF estimate of total consumer credit in any given year is generally only about two-thirds of the FFA value, and in the period of rapidly rising household debt leading up to the Great Recession, this divergence in levels contributed modestly to the widening of the gap in net worth. Again, however, a substantial fraction of this divergence appears possibly due to methodological differences. In particular, the SCF asks about credit card balances as of the time the respondent made their last payment (and thus excludes charges incurred in the interim) while the FFA measure balances at a discrete point in time without reference to the payment cycle. Both measures have their merits from the perspective of studying household behavior, and the overall impression of rapidly growing (then slowing or falling) consumer credit is evident using either concept. In order to shed light on whether additional differences between SCF and FFA aggregates are due to the micronature versus aggregate nature of the two data sets, or due to survey versus administrative sources of data, we also compare the SCF to a third source of data, the Consumer Credit Panel, a microdata set drawn from administrative records.

12. See, for example, Zinman (2009) and Brown et al. (2011).

Table 9.1 Household balance sheet (FFA data billions of dollars, levels outstanding)

	1989	1992	1995	1998	2001	2004	2007	2010
Net worth	16,396.3	18,421.2	22,041.3	28,059.9	33,043.0	41,668.1	53,332.2	44,919.7
Assets	19,390.6	22,018.1	26,439.8	33,423.7	40,064.9	51,425.1	66,246.8	57,404.9
Tangible assets and business equity	11,393.2	12,395.0	14,006.7	16,577.2	21,954.9	29,426.8	35,375.6	28,221.2
Real estate, value of residences	6,543.9	7,186.3	7,982.7	9,459.7	13,307.1	18,323.5	21,442.8	16,719.2
Consumer durable goods	1,896.2	2,171.6	2,506.3	2,799.9	3,306.4	3,830.5	4,421.6	4,571.5
Equity in noncorporate business	2,953.0	3,037.1	3,517.7	4,317.6	5,341.5	7,272.8	9,511.2	6,930.5
Financial assets	7,997.4	9,623.0	12,433.1	16,846.5	18,110.0	21,998.4	30,871.2	29,183.7
Safe assets	4,713.3	5,151.6	5,726.0	6,380.2	7,372.2	9,295.9	12,114.4	13,217.3
Deposits and MMMF shares	3,246.7	3,313.4	3,348.3	3,792.1	4,831.3	5,643.0	7,223.4	7,858.5
Bonds	1,466.6	1,838.3	2,377.7	2,588.1	2,540.9	3,652.9	4,890.9	5,358.8
Risky Assets	2,603.3	3,542.8	5,341.2	8,519.6	8,632.7	10,137.8	14,866.5	12,392.3
Directly held corporate equity	2,090.2	2,743.4	4,088.2	6,167.8	6,018.1	6,710.1	10,268.6	7,820.7
Long-term mutual funds	513.0	799.4	1,253.0	2,351.8	2,614.6	3,427.7	4,597.9	4,571.7
Assets inside 401(k)	680.9	928.6	1,365.8	1,946.6	2,105.1	2,564.6	3,890.4	3,574.2
Liabilities	2,994.2	3,596.9	4,398.4	5,363.8	7,021.9	9,757.1	12,914.6	12,485.3
Home mortgages	2,210.0	2,795.0	3,288.8	3,963.0	5,207.5	7,592.2	10,435.3	10,101.9
Consumer credit	784.2	801.9	1,109.6	1,400.7	1,814.4	2,164.9	2,479.3	2,383.4

Table 9.2 Household balance sheet (SCF data billions of dollars, levels outstanding)

	1989	1992	1995	1998	2001	2004	2007	2010
Net worth	16,094.2	16,238.8	19,351.4	27,039.7	39,772.8	47,401.0	61,164.9	54,524.2
Assets	18,486.3	19,218.4	22,853.4	31,689.4	45,494.3	56,157.6	72,369.8	65,929.5
Tangible assets and business equity	11,600.8	11,860.1	12,820.5	16,379.4	22,818.2	31,859.6	42,478.7	36,391.3
Real estate, value of residences	6,812.4	7,245.8	8,052.5	10,313.8	14,242.3	21,522.6	28,039.0	23,360.5
Consumer durable goods	1,069.4	1,033.5	1,443.0	1,611.8	2,080.1	2,509.7	2,734.3	2,751.6
Equity in noncorporate business	3,719.0	3,580.9	3,325.1	4,453.8	6,495.8	7,827.3	11,705.4	10,279.2
Financial assets	6,885.5	7,358.3	10,032.8	15,310.0	22,676.0	24,297.9	29,891.0	29,538.2
Safe assets	3,000.5	2,874.4	3,061.7	3,686.5	5,671.0	6,751.8	7,200.4	8,508.7
Deposits and MMMF shares	2,064.5	1,975.0	2,028.0	2,432.5	3,420.7	4,964.6	5,596.8	6,774.5
Bonds	936.0	899.4	1,033.7	1,254.1	2,250.4	1,787.3	1,603.6	1,734.2
Risky assets	3,089.2	3,569.2	5,369.1	9,512.6	13,933.9	13,539.4	17,108.5	15,203.5
Directly held corporate equity	2,757.1	3,065.8	4,224.5	7,805.3	11,456.1	8,679.6	10,606.2	8,675.5
Long-term mutual funds	332.1	503.4	1,144.5	1,707.3	2,477.8	4,859.8	6,502.4	6,528.0
Assets inside 401(k)	795.8	914.6	1,602.1	2,110.8	3,071.1	4,006.7	5,582.1	5,826.0
Liabilities	2,392.1	2,979.6	3,502.0	4,649.7	5,721.5	8,756.6	11,204.9	11,405.2
Home mortgages	1,873.6	2,513.6	2,911.9	3,816.8	4,780.3	7,455.6	9,617.9	9,688.4
Consumer credit	518.6	465.9	590.1	832.9	941.2	1,301.0	1,586.9	1,716.8

9.2 Comparing SCF and FFA Net Worth

The SCF measure of net worth, as found in Bricker et al. (2012), and FFA's measure of net worth reported in the B.100 table of the Z.1 release are conceptually different in several ways. We perform adjustments to each measure to reconcile the two concepts as much as possible, given the available data, for comparability. While the adjustments affect aggregate levels of net worth, trend and cyclical patterns of net worth are relatively unaffected.

9.2.1 Conceptual Adjustments to FFA Net Worth

First, FFA household net worth includes the nonprofit sector. Where possible, we remove values that are attributable to the nonprofit sector. Certain categories are separately collected for nonprofit holdings, and therefore these can be directly removed. Other categories of household net worth are calculated as residuals after subtracting other sectors from the economy-wide total. For these categories, we cannot separate holdings of nonprofits from those of households, so the values associated with nonprofits remain in the FFA measure of net worth.

Second, pension wealth is treated differently in the two measures. Assets accruing through defined-benefit (DB) pensions plans are an important component of overall household wealth but one whose levels cannot be determined unambiguously using the SCF. Pension recipients, and the SCF by extension, cannot put a value on the assets associated with future or current DB pension payouts without numerous assumptions.¹³ We therefore do not include DB pensions in the measure of household wealth using the SCF, and we must also remove these assets from the FFA household balance sheet.

Lastly, we also remove a few small categories of assets and liabilities that are difficult to measure or compare. On the asset side these categories are life insurance reserves and other financial assets (listed as security credit in FFA). We also remove margin loans and loans against life insurance policies from total liabilities. See table 9A.2 of the appendix for published and adjusted household wealth values.

The impact of these three adjustments can be found in figure 9.1, which presents household net worth measured by FFA from 1989 to 2010.¹⁴ The top-most series is the net worth as reported on the B.100 table; the second line removes nonprofits where possible, and the lowest line is the FFA net worth that is adjusted for comparability with the SCF. These adjustments lower the level but do not substantially alter the time trend of FFA net worth. The FFA net worth climbs steadily between 1989 and 1999, after

13. The SCF asks whether respondents have DB pensions and their source, but collects no additional information about the magnitude of future payments.

14. We present third-quarter (Q3) data from FFA as that period matches most closely the average interview date in the SCF, particularly for high-wealth households.

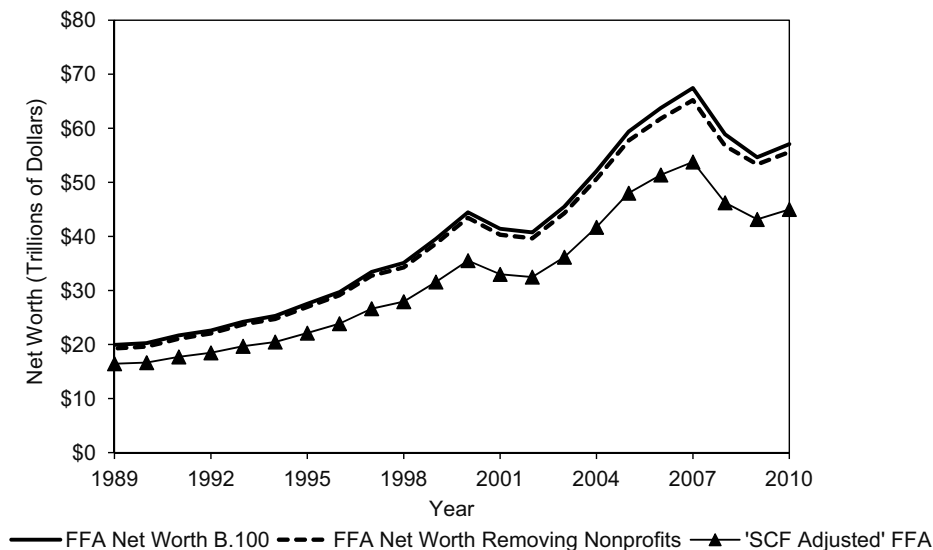


Fig. 9.1 Flow of Funds Accounts, measures of household net worth

Note: The “SCF adjusted” FFA net worth removes nonprofit assets, defined-benefit pension assets, and a few small categories as discussed in the text such as life insurance reserves. See appendix table 9A.2 for full details.

which it levels off for two years. The FFA net worth then climbs steeply until 2007, declines between 2007 and 2009, then recovers somewhat in 2010.

9.2.2 Conceptual Adjustments to SCF Net Worth

There are a few small adjustments made to the SCF to make the aggregates more comparable with FFA.¹⁵ We allocate assets from trusts and IRAs to their component asset types. We remove the smaller categories of assets and liabilities as is done with FFA. These categories include expected payments like lottery winnings or proceeds from a lawsuit, and IRA assets in mineral rights. The FFA does not estimate the hedge fund sector separately, so we remove hedge funds from the SCF net worth. Much of the hedge fund assets will be included in the FFA household sector due to the residual nature of its measurement, but this will not provide full coverage of hedge funds held by households. Removing these hedge fund assets from the SCF household measure does not necessarily bring the two sources more in line with one another, but we do so since we are unable to compare the FFA and SCF on this dimension. Furthermore, SCF questions on hedge funds do not ask about the nature of these assets, which is a component of our

15. The difference between aggregate net worth that corresponds to the concept used by Bricker et al. (2012) and the values reported here range from 5 percent to 9 percent.

comparison of asset holdings in the SCF and FFA. Life insurance and any loans against the policy are removed from assets and liabilities, respectively. Finally, we remove second homes that collect rental income but are not reported as investment properties by the respondent.

These adjustments yield more comparable administrative and survey-based measures of net worth. Figure 9.2 shows that the fully adjusted net worth measures from the two sources track each other closely in the 1990s, with SCF generally coming in just shy of the FFA aggregates. In 2001, SCF net worth is about 25 percent higher than FFA net worth, and this difference persists in all subsequent waves. The leveling between 2000 and 2002 of the FFA is driven by a decline in corporate equity over this time period, and is partially offset by increases in house values. If corporate equity is excluded, the two series match up better between 1998 and 2004, but the SCF still shows higher growth in net worth, particularly from 1998 to 2001. Similarly, because the SCF is conducted every three years, it cannot capture the dynamics between 2008 and 2010 reflected in the FFA. However, both data sources show a similar three-year trend between 2007 and 2010.

The ratio of SCF to FFA net worth was very consistent and close to unity between 1989 and 1998. The ratio increased beginning in 2001, after which

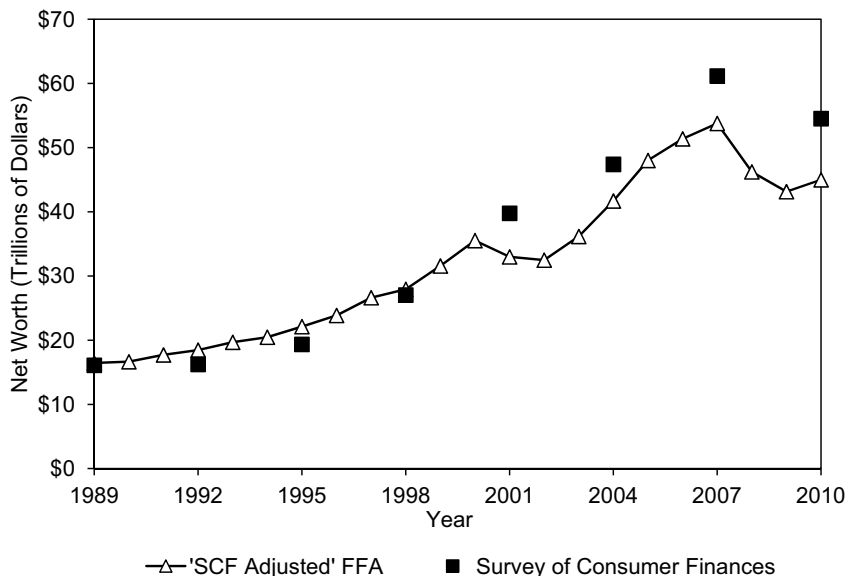


Fig. 9.2 Net worth in comparable terms, Flow of Funds Accounts (FFA) and Survey of Consumer Finances (SCF)

Note: The “SCF adjusted” FFA net worth removes nonprofit assets, defined-benefit pension assets, and a few small categories as discussed in the text such as life insurance reserves. See appendix table 9A.2 for full details.

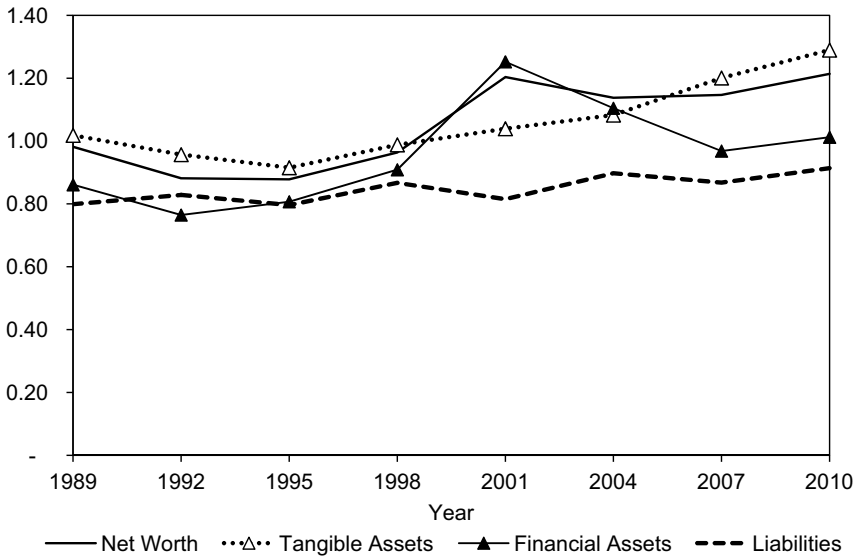


Fig. 9.3 Ratio of SCF aggregate to FFA aggregate value

the SCF shows at least 10 percent more household wealth (figure 9.3). The patterns differ by broad categories of net worth: tangible assets, financial assets, and liabilities. After 1995, there is a steady upward trend in tangible assets represented in the SCF compared to FFA. In 2001, there is a sharp break in financial assets patterns; while SCF financial assets were previously less than FFA financial assets, after 2001 SCF levels exceeded FFA, due to very little growth in the FFA between 1998 and 2001.¹⁶ In 2007 and 2010, the SCF shows similar levels of financial assets as the FFA. The SCF-to-FFA ratio of total liabilities is relatively flat in comparison, remaining between 77 percent and 87 percent for all periods before reaching 90 percent in 2010.

9.3 Tangible Assets

Tangible assets consist of three categories: (a) owner-occupied residential real estate, (b) consumer durable goods, and (c) noncorporate business equity. In general, the level of tangible assets measured in the SCF grad-

16. The numbers for 2001 may appear to be outliers due to the substantial intrayear volatility of corporate equity prices that year. The SCF typically collects data from May to December, while the FFA values are point-in-time estimates, in our case at the close of the third quarter. For instance, the S&P 500 index declined 18 percent between May 1st and September 30th of 2001, then increased 10 percent between October 1st and December 31st. However, since list sample respondents of the SCF, which are chosen due to their high levels of wealth and therefore their large share of households' holdings of equity, are typically interviewed at the end of the field period, the timing of interviews is unlikely to be the sole reason for these outliers.

ually increases compared to the FFA after 1995 and continuing through 2010 (figure 9.3). This is a combination of relatively faster increases in both housing and noncorporate business values reported by households in the SCF. Although the SCF and FFA use fundamentally different approaches to valuing these infrequently traded assets, the overall pattern of boom and bust in asset values during the period leading up to and following the Great Recession is evident in both data sources.

9.3.1 Owner-Occupied Real Estate

The SCF and FFA once took relatively similar approaches to valuing owner-occupied real estate, but diverge methodologically in recent periods. The SCF collects owner-reported values in every survey year, which reflects respondents' subjective valuations at that point in time. The FFA also rely on owners' self-reported house values, from the American Housing Survey (AHS), which is conducted every two years. In between AHS surveys, the FFA use a national housing price index (HPI) from CoreLogic and net investment from the Bureau of Economic Analysis (BEA) to interpolate between the AHS reference points.¹⁷ The AHS data from 2007, 2009, and 2011 were not incorporated into the FFA. At the time of their release, AHS owner-reported values were deemed unreliable relative to house price indices in measuring changes in the aggregate value of the housing stock during the housing bust. In particular, respondents to the AHS indicated that house prices had continued to increase at a fairly rapid rate, on average, in 2006 and 2007. By contrast, market-based measures of house prices showed that prices leveled off in 2006 and fell sharply in 2007. In constructing the FFA, Federal Reserve Board staff decided not to incorporate survey-based information until they had conducted more research on the issue; such research is ongoing. Thus, since 2005, a perpetual inventory equation has been used to estimate the value of residential real estate in the FFA; the CoreLogic national house price index is used as a proxy for price changes for the existing stock, and net investment is from BEA.

Throughout most SCF survey years since 1989, the SCF and FFA measures of aggregate home values are very close. This is not surprising, as both are grounded in owner-reported values of homes.¹⁸ The SCF asks home owners how much their house would be worth if sold at the time of the interview. The AHS poses a question with the exact same wording as the SCF. The primary difference between the AHS and the SCF is that the AHS is a sample of *homes*, not households, and is collected in odd-numbered years,

17. The CoreLogic HPI is calculated using multiple sales of the same property to remove unobserved heterogeneity associated with each property. <http://www.corelogic.com/products/corelogic-hpi.aspx>.

18. Following the FFA approach of measuring owner-occupied residential real estate for comparability, we remove any residential property that collects rental income from aggregate SCF measures. The SCF also measures vacation homes more accurately than the AHS, which is another reason why the SCF values are larger than the FFA.

while the SCF is collected every three years. Given these minor differences, it is not surprising that from 1989 through 2001, the levels of owner-occupied real estate observed in the SCF and the FFA (which is benchmarked to the AHS) match well. In 1998 and 2001, there is a slight divergence, with the SCF reporting higher values by almost 10 percent (see table 9.3 and figure 9.4).

Table 9.3 Household balance sheet (ratio of SCF aggregate to FFA aggregate)

	1989	1992	1995	1998	2001	2004	2007	2010
Net worth	0.98	0.88	0.88	0.96	1.20	1.14	1.15	1.21
Assets	0.95	0.87	0.86	0.95	1.14	1.09	1.09	1.15
Tangible assets and business equity	1.02	0.96	0.92	0.99	1.04	1.08	1.20	1.29
Real estate, value of residences	1.04	1.01	1.01	1.09	1.07	1.17	1.31	1.40
Consumer durable goods	0.56	0.48	0.58	0.58	0.63	0.66	0.62	0.60
Equity in noncorporate business	1.26	1.18	0.95	1.03	1.22	1.08	1.23	1.48
Financial assets	0.86	0.76	0.81	0.91	1.25	1.10	0.97	1.01
Safe assets	0.64	0.56	0.53	0.58	0.77	0.73	0.59	0.64
Deposits and MMMF shares	0.64	0.60	0.61	0.64	0.71	0.88	0.77	0.86
Bonds	0.64	0.49	0.43	0.48	0.89	0.49	0.33	0.32
Risky assets	1.19	1.01	1.01	1.12	1.61	1.34	1.15	1.23
Directly held corporate equity	1.32	1.12	1.03	1.27	1.90	1.29	1.03	1.11
Long-term mutual funds	0.65	0.63	0.91	0.73	0.95	1.42	1.41	1.43
Assets inside 401(k)	1.17	0.98	1.17	1.08	1.46	1.56	1.43	1.63
Liabilities	0.80	0.83	0.80	0.87	0.81	0.90	0.87	0.91
Home mortgages	0.85	0.90	0.89	0.96	0.92	0.98	0.92	0.96
Consumer credit	0.66	0.58	0.53	0.59	0.52	0.60	0.64	0.72

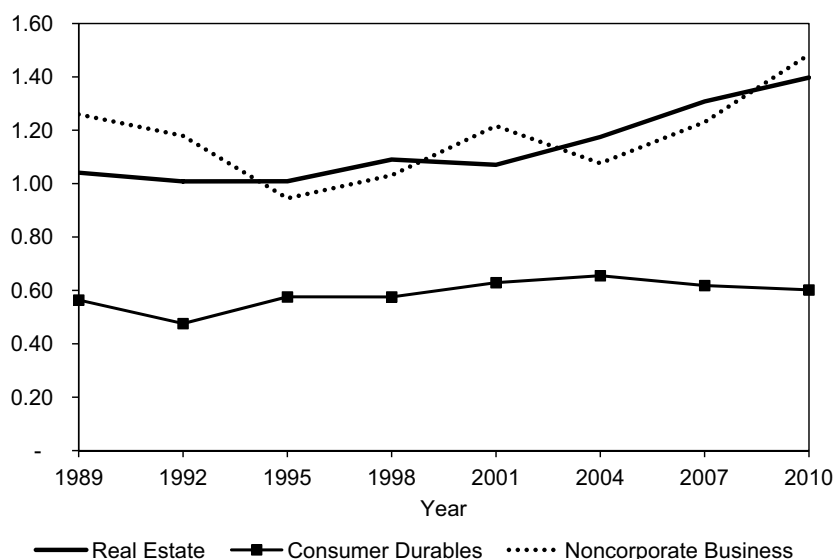


Fig. 9.4 Ratio of SCF aggregate to FFA aggregate value: Tangible assets

The comparability between SCF and AHS owner-reported house values is evident at all points in the distribution of house values and across survey years. Comparison of values over time requires harmonizing the SCF values with the top-coding of high values in the AHS. The public-use AHS is topcoded at \$350,000 through 2003, but that topcode limit was increased in 2005 and is now tied to house price growth. In order to facilitate a direct comparison across the house price distributions, we artificially cap the AHS values at \$350,000 in 2005, so that the increase in the topcode effectively occurs in 2007 when the next wave of the SCF was conducted. We topcode SCF home values at the same thresholds as the AHS in every year. The FFA adjust down the aggregate AHS value of residential real estate 5.5 percent in 2001, 2003, and 2005 to account for the apparent upward bias in reported home values in survey responses shown in Goodman and Ittner (1992) and others.

After making the topcode adjustments, owner-reported house values across survey years line up very well both in terms of the aggregate (figure 9.5) and at various percentiles in the distribution of house values (figure 9.6).¹⁹ One small difference is the value at the 90th percentile in the AHS is slightly smaller than in the SCF beginning in the late 1990s. Thus, even though the sampling approach is very different between the two surveys, the picture of housing values and trends is very similar. That is, the boom and bust in house prices leading up to and following the Great Recession is evident in both surveys.

Beginning with the 2004 SCF survey, there is a growing divergence between the SCF and FFA; in 2007 and 2010, the SCF estimate was more than 30 percent larger than the FFA estimate. The 2004 FFA value combines information from the 2003 AHS, the CoreLogic index between 2003 and 2004, and net investment in housing between those two years. It was a period of rapidly rising house prices, with the growth in 2004 exceeding the gains in 2002 and 2003 according to the national CoreLogic HPI. Between 2001 and 2004, the SCF reported total growth of 50 percent while the FFA and CoreLogic HPI report a change of approximately 40 percent. It is unclear whether the divergence is happening more in the early period (2001–2002) than the later period (2003–2004). According to CoreLogic, the growth from 2003 to 2004 was 50 percent larger than in the two preceding years (about 15 percent compared to annual growth rates of about 10 percent).

In the most recent period, 2007 to 2010, the SCF data show much higher aggregate housing values than the FFA. The divergence in 2007 and 2010 may not be surprising given the differences in estimation methodology. Since the FFA have not been benchmarked to the AHS since 2005, the estimates

19. The 90th percentile in 2005 is missing because it corresponds to a topcoded value. Beginning in 2005, AHS observations with values above the topcode value are given the mean of all properties above the threshold.

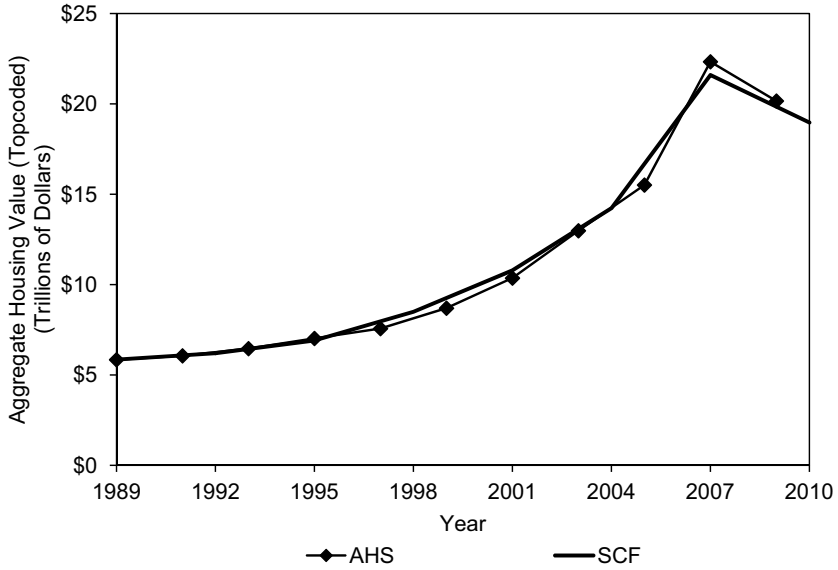


Fig. 9.5 Aggregate owner-occupied real estate, SCF and AHS, topcoded

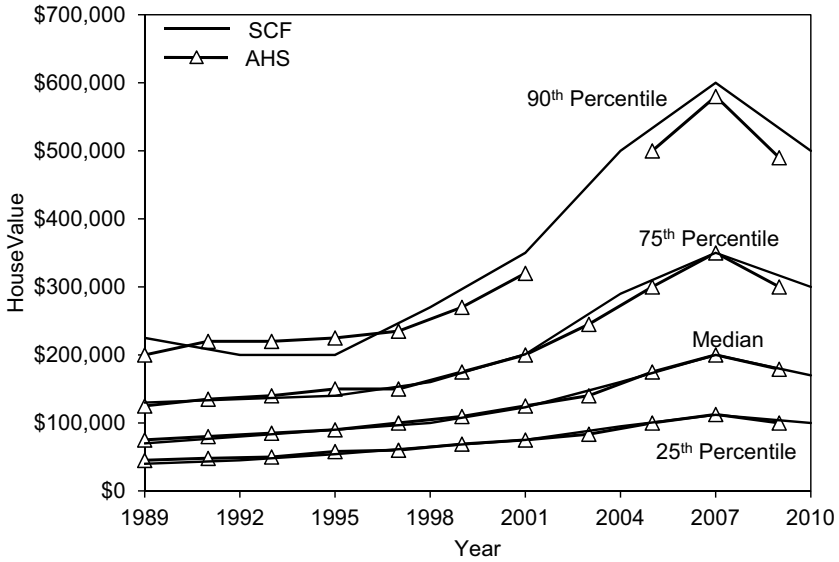


Fig. 9.6 Percentiles from distribution of home values, SCF and AHS

are now driven by transaction-based measures of home values rather than owners' reports. The CoreLogic HPI represents changes in the value of houses that transact in a given period, whereas the SCF is a sample of households, most of which did not engage in a recent transaction. As a result, the SCF and FFA are now using different conceptual frameworks to measure changes in house prices over time.

Most of the increased gap between SCF and FFA aggregate house values occurred between 2004 and 2007. During this period, the housing price boom continued through 2005 before leveling off in 2006 and declining in 2007, the year leading up to the Great Recession. In the period 2007 to 2010, the decline in SCF self-reported house values was less than the value indicated by the CoreLogic transaction-based index, and thus the gap between SCF and FFA aggregates continued to widen, albeit at a slower pace.

9.3.2 Durable Goods

The second category of tangible assets common to the SCF and FFA is durable goods. The FFA obtain values directly from the BEA. The SCF's method of measuring durable goods remains the same over the full time period.²⁰ The ratio of SCF to FFA is fairly constant over the full time period, averaging 60 percent representation of what the FFA reports. This difference is confirmed using BEA tables that show categories not measured by the SCF account for more than 30 percent of all consumer durable goods. As a result, both sources show similar trends in households' holdings of durable goods.

9.3.3 Equity in Noncorporate Business

Among tangible assets, noncorporate businesses are held by the fewest number of households, and the distribution of the holdings is extremely skewed.²¹ The nonfinancial noncorporate business sector consists of partnerships and limited liability companies, sole proprietorships, and properties that receive rental income. Noncorporate farms are included in this sector. For noncorporate financial firms, the FFA include security brokers and dealers. Differences in the valuation methods used by the SCF and FFA along with a high degree of sampling variability (see appendix) because of the distribution of owned business values combine to generate a volatile measure in which SCF business values typically exceed those in the FFA.

The FFA rely on intermediary sources for noncorporate financial and nonfinancial noncorporate business values. For noncorporate financial businesses the FFA get their estimates from SEC filings of security brokers and dealers. For noncorporate nonfinancial businesses, financial assets are estimated using IRS estimates based on business income reported on tax

20. Durable goods measured by the SCF include vehicles, which comprise the majority of this category, small valuables, and other collectibles.

21. Fewer than 15 percent of households held noncorporate equity in 2007 and 2010.

returns, nonfinancial assets are estimated using data from BEA, and data on noncorporate farms primarily come from the US Department of Agriculture (USDA).²² The FFA estimates of real estate holdings incorporate data from CoStar. As with owner-occupied housing, the SCF asks noncorporate business owners how much they believe their business would sell for today.

The SCF finds higher aggregate values for noncorporate equity than the FFA in every year except for 1995.²³ From 1989 to 1995, the two series moved closer together, and in fact, the FFA estimate exceeded the SCF aggregate in 1995. Since then, the two series have diverged substantially, but the overall pattern of boom and bust leading up to and following the Great Recession is evident in both data sets. The value of noncorporate business grew roughly 80 percent in both data sets between 2001 and 2007, though the growth during the boom underscores the difficulties with getting precise estimates. The ratio of SCF to FFA noncorporate equity fell from 122 percent to 108 percent between 2001 and 2004, before rising to 123 percent by 2007. Since the FFA show that real estate holdings comprise much of the net worth of noncorporate businesses, differences in owner-reported and index-based values might explain why SCF measures tend to exceed FFA measures. Sampling variability may also be an issue in the latest comparison (see appendix), but methodological differences may also have played a role. The aggregate value of noncorporate businesses fell about 27 percent in the FFA between 2007 and 2010, while the corresponding decline in the SCF was 12 percent. Thus, the gap between the two estimates widened substantially in the most recent survey. One possible explanation for this recent divergence is that FFA values are tied more directly to realized business incomes, which took a substantial hit during the Great Recession.

9.4 Financial Assets

Financial assets are a large component of total assets and net worth. These assets, which include risky assets like corporate equity, and other assets like deposits, which we will call safe assets, can be held in various types of accounts. High-level FFA-SCF comparisons across account types and risk types tell the same story over time, though we see divergence in detailed drilldowns of portfolio allocation. In both data sets, the aggregate level of financial assets reached about 30 trillion dollars in 2010 (see tables 9.1 and 9.2). In the first half of our study period, the SCF reported lower levels of

22. A description of the data sources and limitations can be found at <http://www.irs.gov/taxstats/bustaxstats/article/0,,id=214346,00.html>.

23. Antoniewicz's (2000) values for noncorporate equity in the SCF are much lower for 1989 to 1998. As a result, she finds that either FFA and SCF are very comparable or that SCF is smaller. Antoniewicz (2000) includes our definition of other residential real estate (vacation homes) as investment real estate instead of net nonresidential real estate. From 1989 through 1998, the value of net nonresidential real estate is more than twice the value of other residential properties.

financial assets than the FFA. The trend has a large break in 2001, after which the ratio of SCF to FFA financial assets fell.²⁴ In the past two SCF surveys, both SCF and FFA show similar levels of financial assets. However, patterns for detailed asset types are not as close for the two data sets, which can be expected due to the very different methods used by the FFA and SCF for allocating financial assets to asset classes.

9.4.1 Assets inside and outside Retirement Accounts

The highest-level breakdown within financial assets is the distinction between assets held inside and outside 401(k)-type accounts and other defined contribution plans, trusts, and managed investment trusts (MIAs). For simplicity, we will refer to these as 401(k)-type plans. Since data on 401(k)-type accounts are collected separately from other financial assets for both the SCF and the FFA, we will consider these assets on their own. Figure 9.7 displays the SCF-FFA ratio of safe and risky assets held outside 401(k)-type accounts and assets inside 401(k)-type accounts over time. While the time trend of measurement of safe and risky assets outside 401(k)-type accounts on the two data sets are similar, the SCF level of 401(k)-type assets has grown relative to the FFA since 1998.

For financial assets outside 401(k)-type accounts the FFA values are residuals, so they include assets held by nonprofits and hedge funds.²⁵ The FFA data on IRA holdings are reported in their respective asset class: deposits, bonds, corporate equity, and mutual funds. Making the SCF comparable to the FFA here requires allocating assets to the same asset categories. Furthermore, the SCF methodology for estimating the value of non-401(k)-type holdings of detailed asset types has changed over time so we will instead focus primarily on analyzing risky assets, which include corporate equity and mutual funds, versus safe assets, which include deposits and bonds.

9.4.2 Deposits and Bonds outside 401(k)-Type Accounts

The SCF levels of safe assets (deposits and bonds) are consistently lower than FFA levels. One explanation is that the residual nature of FFA safe assets likely increases their value relative to the SCF since the FFA include assets held by nonhousehold entities, such as churches and other nonprofits, which are likely to have significant holdings of deposits and bonds.²⁶ The SCF-FFA ratio of safe assets is generally between 0.53 and 0.64, with slightly elevated ratios in 2001 to 2004. Deposits in the SCF are consistently lower than in the FFA. The levels of deposits measured by the SCF were

24. Refer to footnote 17 for more information about 2001 data.

25. Hedge funds are also included in FFA residuals as they do not have direct reporting requirements that could be used to remove them. As mentioned above, some of these assets are held by households.

26. See footnote 11 for more information on FFA data on nonprofit organizations.

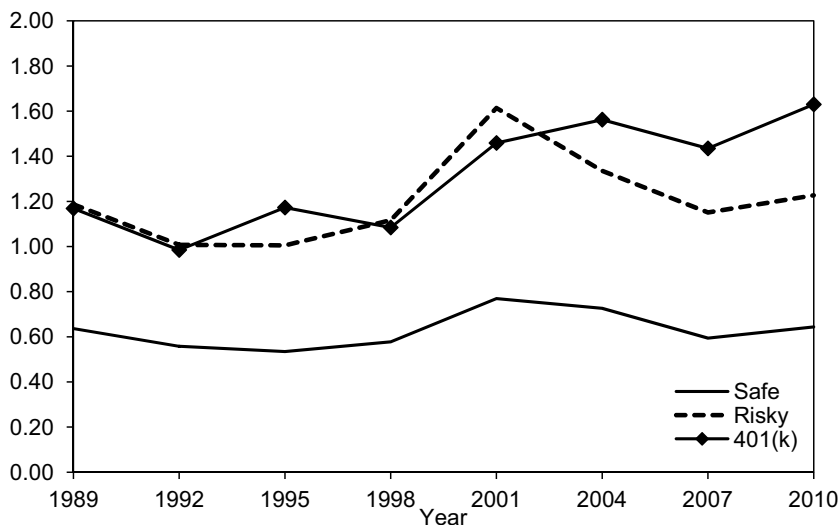


Fig. 9.7 Ratio of SCF aggregate to FFA aggregate value: Financial assets

Notes: Safe assets include deposits and bonds while risky assets include corporate equity and mutual funds.

stable at about 60 percent of FFA deposits until 1998. The SCF-FFA ratio rose to about 70 percent in 2001 and since has stabilized around 80 percent. Some of the reasons for this persistent gap between the SCF and FFA have been established. Avery, Elliehausen, and Kennickell (1988) discuss some of these explanations. For instance, unlike the FFA, the SCF measure does not include currency. Also, check float and the holdings of churches could account for some of the discrepancy.

The SCF also reports much lower bond holdings than the FFA. The SCF-FFA ratio of bonds has declined somewhat from 59 percent in 1989 to 50 percent or below in all years except 2001. In 2001, the ratio reached over 80 percent. Furthermore, the pattern is also partially driven by no growth in bond holdings in the FFA between 1998 and 2001 with a large increase measured in the SCF, which saw almost 100 percent increase. Lastly, SCF respondents are likely to report the face value of their bonds, which may differ from the book values or other types of valuations used in the FFA (see Antoniewicz 2000).²⁷

27. Our analysis yields different findings than Antoniewicz (2000) due to large upward revisions that have been made since 2000 to the FFA historical series.

9.4.3 Mutual Funds and Corporate Equity outside 401(k)-Type Accounts

Risky financial assets consist of mutual funds and corporate equities. The SCF-FFA ratio is close to one in the 1990s. However, the ratio jumps from 1.12 in 1998 to 1.61 in 2001. This is likely attributable to new SCF questions on asset allocations within IRAs added during the 2001 wave.²⁸ In previous waves, IRA accounts were allocated to risky and safe assets based on simple rules-of-thumb drawn from brief follow-up survey questions.²⁹ After 2001, the SCF-FFA ratio came down to lower levels.

Comparing SCF and FFA measure of the two subcomponents of risky assets requires even more detailed allocation of SCF assets. All risky assets held in IRAs, trusts, and MIAs were allocated to corporate equities for survey waves prior 2004, but were subsequently allocated to mutual funds from 2004 onward. Therefore, we expect that the SCF will understate true household holdings of corporate equity and overstate holdings of mutual funds prior to 2004, and vice versa thereafter.

The FFA levels of the value of publicly traded corporate equities are drawn from direct measures of publicly traded shares. For closely held corporations, the FFA combine information from IRS revenue data on S corporations, data from *Forbes* on private C corporations, and data from Compustat. In all survey waves, SCF levels of corporate equity exceed FFA levels. With one exception, the typical difference between SCF and FFA levels is approximately 15 percent. Like the SCF-FFA ratio of bonds, the ratio of corporate equity spiked in 2001, reaching 1.90. Similar to the trend between 1998 and 2001 for net worth, SCF and FFA measures of corporate equities diverge between these two waves. The FFA do not show an increase in corporate equity between these two waves, whereas the SCF levels increase over 40 percent.

The value of mutual funds in the SCF has increased relative to the FFA over the course of the study period. Initially, the SCF-FFA ratio of long-term mutual funds was approximately 0.65. It rose to 0.91 in 1995, dropped in 1998, and in 2001 rose to 0.95. Since 2004, the SCF levels of mutual funds have exceeded 1.4 times that of the FFA. This is consistent with the change in IRA allocations on the SCF discussed above.

9.4.4 Assets inside 401(k)-Type Accounts

Holdings in 401(k)-type accounts are collected separately from other financial assets in both the SCF and the FFA. Prior to 2001, the SCF and

28. Unlike assets held within 401(k)-type accounts and IRA accounts, SCF respondents are queried specifically about holdings of particular asset classes held outside these accounts during all waves.

29. Antoniewicz (2000) assigns the assets in SCF based on the type of institution holding the account. However, this approach is no longer realistic due to consolidation in the banking industry.

FFA show very similar levels of assets in 401(k)-type accounts. Starting in 2001, the SCF reports levels of 401(k) holdings that are over 40 percent higher than those reported by the FFA. Some of this divergence may be due to data coverage. The SCF changed its questionnaire in 2001 to include current and future work-related defined contribution plans.

Consequently, the SCF level of 401(k) holdings has exceeded that on the FFA persistently since 2001. The SCF-FFA ratio held relatively steady between 2001 and 2007 and increased in 2010. This is due to the fact that the SCF shows an increase in the value of assets between 2007 and 2010, whereas the FFA show a modest decline.

9.5 Liabilities

Household liabilities cover home mortgages and consumer credit and debt. Levels of liabilities have increased over time, as shown both in the FFA and SCF data (see tables 9.1 and 9.2). However, we do not expect aggregate levels of liabilities as measured on the FFA to perfectly match SCF aggregate levels due to major differences in their methods. Like the SCF's approach to collecting data on assets, the survey asks respondents about their liabilities account by account. The FFA collects data on liabilities by type of institution, including savings institutions, credit unions, government-sponsored enterprises, and finance companies. Data on mortgages, consumer credit, and other liabilities are collected separately, and subtypes are not drilled down. In contrast, SCF asks respondents about various types of outstanding debt within those three categories. For instance, respondents are asked separately about mortgages and home equity lines of credit on primary and second homes, credit cards, education loans, vehicle loans, and so forth. Furthermore, the two sets of data measure fundamentally different concepts. The FFA collect data on consumer *credit*, which includes current balances that consumers may pay off in full without incurring interest—so-called “convenience credit,” whereas SCF focuses on outstanding consumer *debt*, which excludes convenience credit.

As can be seen in figure 9.3, the ratio of total liabilities from the SCF and FFA has been relatively stable during this time period. Liabilities on the SCF were about 77 percent of those measured by the FFA in 1992, and this ratio subsequently hovered around 80 percent, ending at 88 percent in 2010. As shown in figure 9.8, the SCF-FFA ratios of the two major categories of liabilities (mortgages and consumer credit/debt) have been relatively stable over time.

9.5.1 Home Mortgages

Overall, the SCF and FFA measures of home mortgages track each other quite well. The SCF levels of home mortgages have become modestly closer to FFA levels over time. The SCF levels of mortgages were between 85

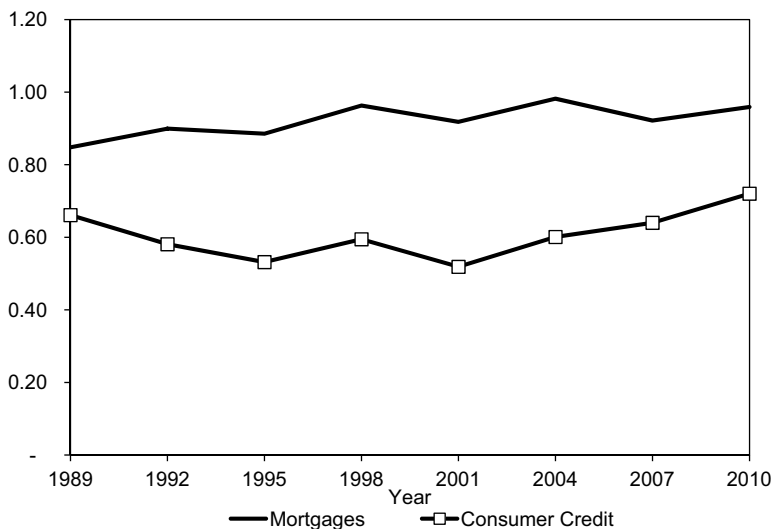


Fig. 9.8 Ratio of SCF aggregate to FFA aggregate value: Liabilities

and 98 percent, settling at 96 percent in 2010. This comparison suggests that administrative and survey measures of home mortgages exhibit similar trends over time. The similarities are likely attributable to the fact that the FFA and SCF have relatively consistent conceptual definitions and data collection methods throughout the sample period. The results are consistent with Bucks and Pence's (2008) findings that the mortgage terms reported by home owners on the SCF match administrative records as well for fixed-rate mortgages. Both data sets show a growth in home mortgages over time, with a leveling off between 2007 and 2010.

9.5.2 Consumer Credit and Debt

While the SCF measures outstanding consumer *debt*, the FFA explicitly measures consumer *credit*, which includes current balances, whether or not they are paid off in full without incurring interest. Therefore, SCF measures of consumer debt should, due to definitional differences, be smaller than FFA measures. Furthermore, the discrepancy between the two sources of data may change over time depending on the importance of convenience credit.³⁰ The greater the convenience use of consumer credit, the greater the definitional discrepancy between the SCF and FFA measures of liabilities. Lastly, some differences may arise due to difficulties in separating spending for personal versus business purposes.

30. Johnson (2004) presents evidence that levels of convenience credit have increased over time.

The SCF consumer debt was about two-thirds the level of consumer credit measured by the FFA in 1992, falling to half in 2001, then rose to 71 percent in 2010. This is consistent with previous studies documenting the gap between credit card measures, one of the primary components of consumer credit/debt, on the SCF and FFA. Zinman (2009) has shown a gap in aggregate credit card debt between the SCF and G.19 release, the FFA's main source for credit card data.³¹

9.5.3 Credit Card Balances on Administrative and Household Microdata

The G.19 data used by the FFA are aggregates from administrative data, and the SCF collects microdata using survey responses. To investigate whether discrepancies between the two data sources arise because one source uses macrodata whereas the other uses microdata, or because one uses administrative sources rather than survey responses, we turn to a third data set. The Federal Reserve Bank of New York's Consumer Credit Panel (CCP) provides administrative microdata on household liabilities for individuals with credit reports (Lee and van der Klaauw 2010). In a comparison of 2007 data from the SCF and the CCP, Brown et al. (2011) find that the levels of overall debt from the two data sources are fairly close, as are levels of overall home-secured debt and education loans. However, the authors find that rates and levels of holding credit card debt are lower on the SCF than the CCP.³²

In particular, Brown et al. find that about 46 percent of SCF respondents report outstanding credit card debt, whereas the Consumer Credit Panel/Equifax implies 76 percent of households have credit card balances on their credit reports. The 46 percent rate calculated in the SCF is the proportion of households presumed to have credit reports that report outstanding balances on credit cards after the last payments on those accounts. However, the 76 percent of households with credit card balances from the CCP is computed using any credit card balances from credit reports and cannot distinguish between convenience usage and such outstanding balances. Adding in the additional 28 percentage points of SCF 2007 households who report having new credit card charges (but no outstanding balances) yields an estimated 74 percent of credit-report generating households with credit card charges, compared to the 76 percent found in the CCP.

Including new credit card charges as well as outstanding balances on credit cards on the SCF, which makes the SCF measure of credit card balances more comparable to the administrative data, also substantially increases SCF aggregate credit card levels. This broader measure would increase SCF

31. See Furletti and Ody (2006) for more details on the G.19 estimate of consumer credit.

32. Their results are consistent with Zinman (2009), which is unsurprising given that the CCP and G.19 both measure credit from credit cards, not outstanding balances alone.

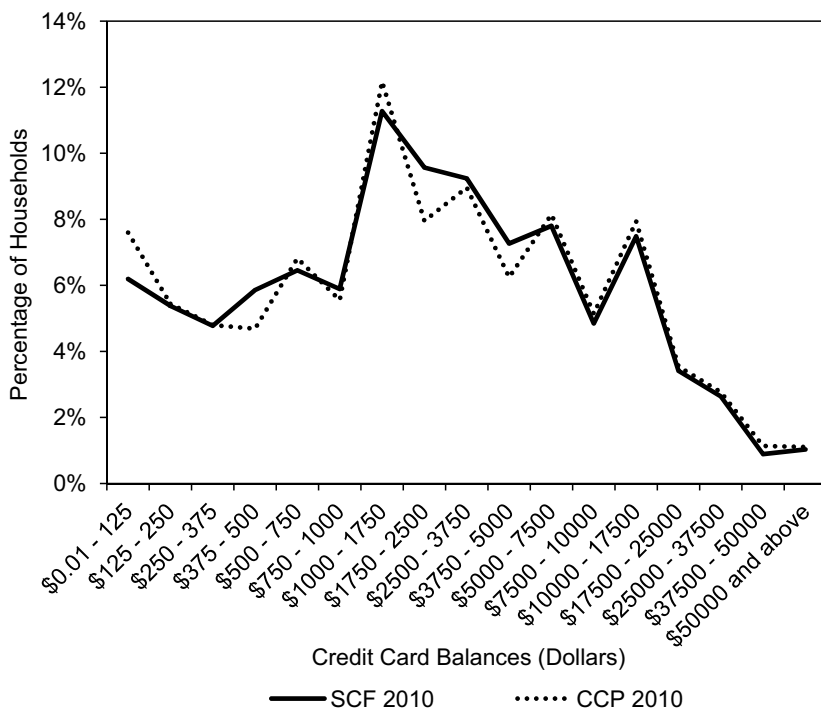


Fig. 9.9 Distribution of credit card balances on the SCF and CCP, 2010

levels of credit card debt by 28 percent in 2001 and 2004, 21 percent in 2007, and 25 percent in 2010.

Figure 9.9 shows the distribution of credit card balances by household, conditional on having any credit card spending, in the CCP and the SCF (using the broader definition including new charges) in 2010. The distributions are quite close across the four waves of the SCF that overlap with the CCP data.³³ Therefore, the distributions of comparable concepts are very close for administrative and survey-based microdata.

Table 9.4 shows the proportion of total balances attributable to new charges for waves between 2001 and 2010. In all waves, the greater the total balance on credit cards, the smaller the proportion attributable to new charges. For instance, the vast majority of balances under \$1,000 are attributable to new charges rather than revolved debt. Both mean and median proportions of total balances attributable to new charges have declined in

33. In 2001 and 2004, the CCP shows greater mass between \$7,500 and \$17,500, but the distributions line up remarkably for this range in 2007 and 2010. The figures for 2001 to 2007 are available upon request.

Table 9.4 Proportion of total credit card spending attributable to new charges, SCF

Balances (dollars)	2001		2004		2007		2010	
	Mean (%)	Median (%)	Mean (%)	Median (%)	Mean (%)	Median (%)	Mean (%)	Median (%)
0.01–125	88.9	100	92.0	100	82.4	100	87.5	100
125–250	80.0	100	79.2	100	71.7	100	75.9	100
250–375	75.7	100	68.7	100	64.9	100	72.8	100
375–500	69.8	100	70.4	100	63.8	100	70.8	100
500–750	62.6	77.6	61.4	68.1	58.3	69.2	66.8	100
750–1,000	62.6	68.7	63.7	100	59.5	82.2	65.2	100
1,000–1,750	54.5	51.1	56.0	53.8	55.0	58.9	56.3	59.8
1,750–2,500	49.7	44.7	54.0	52.5	50.2	48.9	59.4	83.4
2,500–3,750	40.1	21.3	41.0	18.4	43.3	27.0	53.0	50.0
3,750–5,000	36.8	10.4	40.6	24.6	40.1	16.7	45.6	26.3
5,000–7,500	26.5	7.7	33.2	13.1	34.7	9.8	39.3	11.7
7,500–10,000	21.2	7.3	22.2	4.8	25.4	5.9	33.9	6.7
10,000–17,500	17.4	3.8	18.9	5.1	16.2	3.8	19.8	3.9
17,500–25,000	17.6	3.5	19.5	4.5	12.5	2.3	14.3	2.2
25,000–37,500	24.5	4.1	17.7	2.5	13.6	3.2	11.0	1.6
37,500–50,000	12.7	0.9	24.7	2.8	11.0	5.1	11.3	1.3
50,000 and above	29.2	7.0	18.8	5.2	6.4	1.4	11.0	2.1

2007 to 2010 for high balances over \$25,000, which would be consistent with the narrowing gap in consumer credit and debt on the SCF and FFA in recent waves.

Further research is needed to investigate if other characteristics of consumer debt are sources of discrepancies between survey and administrative data. In addition to conceptual differences between consumer credit on the FFA and consumer debt on the SCF, differences in credit card measures might be attributable to the individual nature of such accounts. Whereas mortgages might be considered household-level loans, credit card accounts are often held separately by different members of the family, and information on the account-level charges and debts may be shared across family members differently in different households. Since the SCF only interviews one respondent per household, such heterogeneity may lead to some respondents producing highly accurate levels of outstanding balances and new charges, if they are single or are fully aware of the credit card behavior of all other members of the family. Other respondents may not be able to accurately report credit card behavior on behalf of their relatives. In addition, the SCF asks respondents to exclude business credit cards. Individuals may use business cards for personal spending, and personal spending for business purposes, which makes it difficult for both the survey and administrative side to isolate personal debt of households. Further investigation can shed light

on the relative importance of these factors in explaining why SCF aggregate liabilities have been 80 to 91 percent of FFA aggregate liabilities.

9.6 Conclusions

The period leading up to the Great Recession can be characterized by a dramatic increase in asset prices, especially for tangible assets like owner-occupied housing and noncorporate businesses, and to some extent in the value of corporate equities and other risky assets as well. The other dominant feature of the decade or so preceding the recent financial crisis was an explosion in household debt, especially mortgages, associated with that boom in asset prices. The financial crisis itself was, of course, driven by the subsequent collapse in asset prices, which combined with elevated debt levels, has left many household balance sheets in distress.

These overarching patterns of boom and bust in asset prices and debt accumulation along with the consequent effects on household balance sheets are evident in both the macrolevel FFA and the microlevel SCF. There is some divergence between the SCF and FFA in terms of asset prices increases during the boom, and to a lesser extent in the severity of asset price declines in the most recent period, but the general implications for household behavior one takes away from the long-term trends and fluctuations is basically the same. The different patterns that do exist in categories such as owner-occupied real estate, noncorporate businesses, and credit cards are attributable, at least in part, to methodological differences in the production of the two data sets.

Researchers using the SCF and FFA to study various aspects of household behavior need to appreciate the different strengths of each data set. Maki and Palumbo (2001) incorporate household heterogeneity in income and educational attainment measured by the SCF with the aggregate trends found in the FFA and exploit the strengths of both data sets in tandem. Similarly, Gale and Pence (2006) use the SCF to show that the aggregate increase in wealth that occurred in the 1990s accrued favored older households over younger ones. Likewise, researchers should keep those methodological differences in mind when drawing conclusions.

Appendix

Table 9A.1 Household balance sheet (SCF data standard errors)

	1989	1992	1995	1998	2001	2004	2007	2010
Net worth	898.0	409.3	523.9	652.7	710.4	1,292.4	927.2	1,076.3
Assets	955.0	425.8	541.2	644.8	741.5	1,348.5	939.8	1090.6
Tangible assets and business equity	720.7	234.6	266.3	316.6	475.7	745.4	783.6	634.1
Real estate, value of residences	250.1	166.5	148.6	216.4	241.5	501.9	448.8	384.8
Consumer durable goods	50.7	29.5	38.2	39.5	79.0	75.1	58.5	63.3
Equity in noncorporate business	545.4	176.0	193.4	324.2	385.3	463.7	656.4	545.7
Financial assets	416.7	286.8	407.7	523.7	562.0	782.4	682.9	862.4
Safe assets	214.4	94.7	181.2	124.2	203.9	283.2	235.8	397.5
Deposits and MMMF shares	137.9	67.7	124.8	103.1	137.5	229.8	164.4	319.9
Bonds	122.4	66.0	92.7	83.1	148.6	148.3	132.3	224.1
Risky assets	255.3	283.2	288.6	491.6	471.4	536.3	588.0	641.5
Directly held corporate equity	264.2	246.1	228.5	441.4	435.4	436.3	486.3	536.4
Long-term mutual funds	51.0	57.5	133.9	130.0	146.4	274.0	265.7	308.5
Assets inside 401(k)	78.9	77.9	83.9	106.6	169.1	196.1	244.4	249.2
Liabilities	101.8	84.8	63.7	103.8	123.7	188.2	206.5	228.4
Home mortgages	90.5	81.8	59.3	94.2	120.2	174.4	197.3	215.8
Consumer credit	29.5	25.0	15.1	22.5	35.0	47.8	43.7	48.1
Personal income (NIPA, 1 year lag)	141.1	48.8	72.3	90.9	204.6	116.5	150.4	130.9

Note: Billions of dollars, levels outstanding.

Table 9A.2 Adjustments to FFA household net worth, 2010 annual

B.100 Households and nonprofit organizations: net worth	\$ 57,080,160
Step 2. Subtract nonprofit assets	
Nonprofit organizations: real estate at market value	\$ 1,888,508
Nonprofit organizations: equipment and software, current cost basis	\$ 304,618
<i>Equals</i>	<i>\$ 54,887,034</i>
Step 3. Add nonprofit liabilities	
Nonprofit organizations: municipal securities and loans, liability	\$ 268,092
Nonprofit organizations: commercial mortgages, liability	\$ 184,426
Nonprofit organizations: trade payables, liability	\$ 268,745
<i>Equals</i>	<i>\$ 55,608,297</i>
Step 4. Subtract non-SCF comparable assets	
Households and nonprofit organizations, total miscellaneous assets	\$ 811,907
<i>Equals</i>	<i>\$ 54,796,390</i>
Step 5. Add non-SCF comparable liabilities	
Households and nonprofit organizations, other loans and advances, liability	\$ 135,816
Life insurance companies, deferred and unpaid life insurance premiums, asset	\$ 22,560
<i>Equals</i>	<i>\$ 54,954,766</i>
Step 6. Subtract off all pension fund assets	
Households and nonprofit organizations, pension fund reserves, asset	\$ 12,332,064
<i>Equals</i>	<i>\$ 42,622,702</i>
Step 7. Add DC pensions	
Private defined contribution pension funds, total financial assets	\$ 3,574,161
Federal government retirement funds, total financial assets of held by Thrift Savings Plan	\$ 246,937
<i>Equals</i>	<i>\$ 46,443,800</i>

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