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Evaluating Wealth Data in Wave 4 of the Redesigned 2014 Survey of Income and Program Participation*

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ABSTRACT: As part of the 2014 redesign of the Survey of Income and Program Participation (SIPP), several changes were made to the wealth module of the survey to fill gaps in question content and improve clarity of existing questions. To evaluate the effects of these changes over the Panel, 2014 Wave 4 SIPP wealth data are compared with Survey of Consumer Finances (SCF) wealth data to investigate how the match between the SIPP and the SCF changed from Wave 1 of the questionnaire redesign. We find that the match between the SIPP and the SCF has remained consistent for most wealth estimates between Waves 1 and 4, although some comparisons have changed. We offer potential explanations for why some estimates have shifted over time.

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1. Introduction

Accurate measurement of household wealth is important for studying economic behavior and well-being. Wealth data allows researchers and policymakers to explore how household wealth varies across social and economic characteristics and how various groups within the U.S. might endure hardships when faced with unexpected expenses or drops in income. At the same time, wealth inequality has received increasing attention from some researchers and policymakers.[1]

The Survey of Income and Program Participation (SIPP) is one of the primary sources of wealth data for the U.S. population. The SIPP has a large sample size, is a panel study, and includes a wide breadth of content on employment, health insurance coverage, and participation in government programs. Because the U.S. does not have a wealth tax, Internal Revenue Service does not serve as a centralized administrative data source on wealth in the U.S. Other agencies with information about wealth, such as the Federal Reserve, have administrative data on some (but not all) sources of wealth or they have the information at an aggregate (rather than a household) level. Thus, survey data provide the most comprehensive measure of wealth in the U.S. from the household perspective. However, survey data are prone to measurement error, and questions on financial topics prove particularly challenging for many respondents.

The purpose of this paper is to support the careful use of SIPP data by researchers by examining how changes to the 2014 Survey of Income and Program Participation affected wealth data quality over the Panel. In 2014, numerous changes were made to the SIPP. The asset section underwent a major revision, in which new assets were added and asset income and values were asked together rather than in separate sections. These changes impacted wealth data quality and estimates of wealth for various demographic groups (Eggleston and Gideon 2017).

[1] For example, Saez and Zucman's (2016) paper on wealth inequality looks at how much wealth is held by the wealthiest 0.1 percent of households. In addition, Munoz et al. (2015) examine how wealth varies across numerous racial and ethnic groups in the Boston Metropolitan Statistical Area.

To address how wealth data quality has changed over the 2014 SIPP Panel, we compare estimates of wealth using the SIPP to estimates using the Survey of Consumer Finances (SCF). The SCF is considered the "gold standard" for survey wealth data.[2] The SCF's dual-frame sample design oversamples high-wealth families and includes detailed questions aimed at capturing complex asset holdings held by these families. This paper presents estimates of the differences between the 2014 Wave 4 SIPP and the 2016 SCF and compares them to differences between the 2014 Wave 1 SIPP and the 2013 SCF, as reported in Eggleston and Gideon (2017). The 2014 Wave 4 SIPP data and the 2016 SCF data refer to wealth from calendar year 2016, while the 2014 Wave 1 SIPP data and the 2013 SCF data refer to calendar year 2013.

This paper builds on previous research evaluating the quality of the SIPP wealth data. These studies similarly focus on comparing estimates from the SIPP to other surveys. Curtin, Juster, and Morgan (1989) and Wolff (1999) compare the SIPP and the SCF from the 1980s and early 1990s. In general, upon excluding the wealthiest individuals, they found the level and distribution of wealth to be comparable across these surveys. Czajka, Jacobson, and Cody (2003) find larger discrepancies in the 1996 SIPP Panel (calendar year 1998)—aggregate net worth estimated using the SIPP was just under half of the magnitude estimated using the SCF, and the median net worth estimate in the SIPP data was approximately two-thirds of the analog in the SCF data. Most of this discrepancy was due to lower estimates of the holdings of the wealthy in the SIPP.

Eggleston and Klee (2015) investigate how changes implemented based on recommendations from Czajka et al. (2003) affected the match between the 2008 SIPP Panel and the SCF for calendar year 2010. They find that the match between the SCF and the SIPP improved in some dimensions but not others. Eggleston and Gideon (2017) explore the changes made from Wave 7 of the 2008 SIPP (calendar year 2010) to Wave 1 of the 2014 SIPP (calendar year 2013). Major improvements were found across

[2] National Research Council (2009) is one among many sources that have applied this label in reference to SCF.

multiple measures of household wealth, including more accordant measures of total net worth as well as debt and asset ownership rates and values.

In this paper, we compare Wave 4 of the 2014 SIPP Panel (calendar year 2016) to the 2016 SCF. Our methodology largely resembles Czajka et al. (2003), Eggleston and Klee (2015), and Eggleston and Gideon (2017). We compare the net worth of U.S. families as well as the components of net worth. Continuing the methodology used in Eggleston and Gideon (2017), we break down net worth by major asset categories, such as financial assets held outside retirement accounts.

We find that many of the differences between the 2014 SIPP Wave 4 and 2016 SCF estimates (calendar year 2016) are similar to the differences between the 2014 SIPP Wave 1 and 2013 SCF estimates (calendar year 2013). However, the magnitude of the difference for certain statistics shifted between calendar years 2013 to 2016. For instance, the difference in mean net worth between the two surveys in calendar year 2016 was higher relative to the difference in mean net worth between the surveys in calendar year 2013. For many measures, values have not qualitatively shifted from their previous estimates. We conclude that (1) the overall level of the SIPP variables has remained mostly consistent between the first and last wave of the 2014 Panel, and (2) the 2014 SIPP Panel data continue to give improved wealth estimates for U.S. households relative to 2008 SIPP Panel.

Nevertheless, there are still potential quality problems with some individual asset categories, as indicated by large differences between the SIPP and SCF estimates. For example, the estimate of the median value for trusts is $300,000 in Wave 4 of the 2014 SIPP (calendar year 2016). This yields a difference of -$111,700 between the SIPP and the SCF, which is over a quarter-million dollar swing in measured differences from what was observed in Wave 1 of the 2014 SIPP and the 2013 SCF (calendar year 2013)(Table 4). However, for some broader asset categories, such as assets in tax-preferred retirement accounts, the differences between the SIPP and the SCF remain small. And for many broader categories -- such as total retirement account ownership rates, total median value of assets, and total

equity in real estate -- there remains no statistically significant difference. Taking the SCF as a benchmark, the SIPP data have remained stable along a variety of dimensions, as described below, although there are still some large discrepancies for some individual assets.

2. Data

2.1 Survey of Income and Program Participation

Our primary dataset of interest is the Survey of Income and Program Participation (SIPP). The SIPP is a longitudinal survey from the U.S. Census Bureau which interviews about 30,000 to 45,000 households over a four-to-five year period.[3] The survey collects information about the income, assets, labor market activity, and participation in government welfare programs of U.S. households.

Wealth data have been collected in every panel since the survey began in 1984. The 2014 SIPP Panel was the first to introduce a variety of survey updates that affected wealth measurement. In 2014, the SIPP underwent numerous revisions that affected wealth measurement, including implementing a new methodology for assigning vehicle trade-in values from the National Automobile Dealers Association (NADA) using reported year, make and model; see Eggleston and Gideon (2017) for details.[4] Respondents in the 2014 SIPP Panel were interviewed once per year, and wealth data were collected during every interview. Information on a wide variety of assets and debts was collected and includes variables on student loans, education savings accounts, businesses owned as an investment, annuities, trusts, the face-value of life insurance, retirement accounts, checking and savings accounts, property values, and credit card debt.

[3] The sample size varies across panels.
[4] The NADA Used Car Guide was acquired by J.D. Power in 2015. We refer to the data provider for reference year 2016 as J.D. Power.

Importantly for this paper, there were no substantive changes to the SIPP questionnaire between Wave 1 and Wave 4 of the 2014 Panel. Thus, changes in the difference between the SIPP and the SCF during this time period are most likely due to other factors, such as SIPP sample attrition.

Due to sample attrition, Wave 4 of the 2014 SIPP has a higher cumulative nonresponse rate than Wave 1 of the 2014 SIPP. This leads to Wave 4 having a smaller sample size than Wave 1 (17,000 Wave 4 households, fewer than the 29,500 Wave 1 households). Because Wave 4 has a smaller sample size and higher nonresponse rate, there exists the potential for Wave 4, relative to Wave 1, to have more unit nonresponse bias and higher sampling error. However, higher unit nonresponse rates don't necessarily lead to higher unit nonresponse bias (Groves and Peytcheva 2008). In addition, the nonresponse adjustment in SIPP for Waves 2 and beyond included a number of variables specifically intended to reduce bias by representing the differential characteristics of those that leave the sample compared with those who stay in sample. Thus, even though Wave 4 had a higher cumulative nonresponse rate, the nonresponse bias may be no worse than in Wave 1 given all the inputs that went into the weighting program for attritors.

2.2 Survey of Consumer Finances

The Survey of Consumer Finances (SCF) is a triennial interview survey sponsored by the Federal Reserve Board of Governors in collaboration with the U.S. Department of the Treasury. Data are collected by the National Opinion Research Center (NORC) at the University of Chicago. Because wealth is a focus for the SCF, the SCF has more detailed questions on assets and debt. Further, SCF includes questions on some scarcely held assets and liabilities, as well are more time devoted to wealth concepts in interviewer training (Athey and Kennickell 2005). In total, 6,254 families were interviewed as part of the 2016 survey.

2.3 Sampling Frames

In both the SIPP and the SCF, the sample frame and questionnaire content are specifically designed to construct nationally representative estimates of wealth holdings. The SCF sample design consists of two parts: a standard geographically-based random sample and a sample of primarily high-wealth families based on data from the Internal Revenue Service (IRS).[5] This is in contrast to the SIPP, which oversamples low-income areas based on data from other Census surveys and the decennial census.

Using sample weights to generate estimates corrects for oversampling of various populations. So, if the weights are designed correctly, the SIPP and SCF comparisons should not be impacted by differences in the sampling methodologies.[6] However, because the SCF uses IRS tax return data to sample some respondents, they have more information on some non-respondents than the SIPP does. Because of this, the SCF weights are potentially able to better correct for nonresponse bias than the SIPP weights. In addition, oversampling may affect the precision of various estimates. For example, because the SCF oversamples high-wealth households, the SCF data may have a more precise estimate of the wealth of high-wealth households for a given sample size.

2.4 Unit of Analysis

One major difference between the SIPP and the SCF is the unit of analysis. The SCF's unit of observation is a Primary Economic Unit (PEU), which includes a household's economically dominant individual or couple and their financial dependents. In the SIPP, the main unit of observation is a household, which consists of everyone living together in a housing structure.[7] For many common household and family structures, such as a married couple with children, the Census household is the

[5] To sample high-wealth households, the SCF imputes the wealth of potential respondents based on income reported in tax returns. For more details on this methodology, see Bricker et al. (2017).
[6] In addition, the weighting methodology did not change in the 2014 SIPP Panel, so changes in the difference between estimates from the SCF and the SIPP over time should not be impacted by changes in weighting.
[7] This is a standard unit of analysis for household surveys conducted by the U.S. Census Bureau.

same as the PEU. However, in instances such as a married couple who had a relative living with them who has their own job and maintains their own finances, then they would be in the Census household but not in the PEU.

We use demographic and family relationship variables collected in the SIPP to simulate equivalent PEUs.[8] This is necessary because the SIPP does not collect data on economic dependence. We only include household members who are in the household head's family, are an unmarried partner of the household head, or are a child under 25 of an unmarried partner of the household head.[9] We exclude siblings and other relatives in the household head's family who are over 25. This procedure generates a comparable unit of analysis, although we likely exclude some household members who are economic dependents, such as a parent with a disability who lives with his or her child and relies on this person for financial support.

2.5 Group Quarters

Another difference between the SIPP and the SCF is the sampling of group quarters. The SIPP includes noninstitutional group quarters in its sampling frame (such as student dorms and convents), while the SCF does not. Because of this, we exclude SIPP respondents living in group quarters. Our decision to exclude group quarters reflects the methodology in Eggleston and Gideon (2017), which also excludes group quarters in their SIPP samples.

2.6 Reference and Recall Period

Finally, the 2014 SIPP and the 2016 SCF also differ in the reference and recall period of the wealth data. In Wave 4 of the 2014 SIPP, interviews occurred between February and June of 2017, and respondents were asked to report asset and debt values as of the last day of 2016. The 2016 SCF, on the

[8] This procedure was first developed by Czajka et al. (2003) and used by Eggleston and Klee (2015).
[9] Czajka et al. (2003) and Eggleston and Klee (2015) have a condition which excludes subfamilies in which the subfamily head was over 25. Because the 2014 SIPP no longer has subfamily indicators, we do not include this restriction. This difference should be minor, as our procedure still excludes many relatives in the household head's family who are over 25.

other hand, interviewed respondents throughout 2016, and respondents were supposed to report the value of assets as of the day of the interview. Because the SIPP has a longer recall period for asset questions, it is possible that recall error and asset value fluctuations may affect the comparisons between the SIPP and the SCF. In addition, stock market changes over the course of the year might affect the difference between SIPP and SCF as well.

3 Results

We start by benchmarking SIPP estimates of the distribution of net worth to estimates from the SCF. Our measure of net worth consists of (i) financial assets inside tax-preferred retirement accounts; (ii) financial assets outside tax-preferred retirement accounts; (iii) miscellaneous financial assets; (iv) unsecured debt; (v) equity in real estate; and (vi) equity in vehicles. Notably absent from measures of net worth in both the SIPP and the SCF is the expected present value of defined benefit pensions, which might be an important source of wealth for older cohorts but is less important in recent years, as younger cohorts are less likely to be covered by these types of pensions.

In order to provide more details about the changes in the SIPP net worth estimates, we then compare ownership rates and the median value conditional on ownership for these broad asset and debt variables, as well as their sub-components. Appendix B provides details on how we construct standard errors in order to compare the SIPP estimates with the SCF estimates.

3.1 Benchmarking Net Worth in the SIPP and the SCF

Table 1 presents net worth estimates using Wave 4 of the 2014 SIPP and the 2016 SCF (calendar year 2016). We compare estimates from the SIPP and the SCF in two ways – the arithmetic difference (SCF's estimate minus SIPP's estimate) and the ratio of the SIPP estimate to the SCF estimate. A ratio closer to 100 indicates a closer match. Table 1 also lists estimates of the SIPP to SCF ratio using Wave 1 of the 2014 SIPP and the 2013 SCF (calendar year 2013). The last column compares how the differences

in the estimates of net worth between the SIPP and the SCF changed between 2013 and 2016.

Table 1: Overview of Net Worth Estimates

	2014 SIPP Wave 4 and 2016 SCF (Calendar Year 2016)						2014 SIPP Wave 1 and 2013 SCF (Calendar Year 2013)		SIPP and SCF (Calendar Year 2013 vs. 2016)	
Statistic	SIPP Estimate	SCF Estimate	Difference	Difference Standard Error	SIPP/SCF Ratio	Ratio Standard Error	SIPP/SCF Ratio	Ratio Standard Error	Difference in Differences	Difference in Differences Standard Error
25th Percentile	4,989	10,340	5,351	516	***48.2	3.9	***42.4	4.0	314	607
Median	91,620	99,060	7,440	3,964	*92.5	3.9	96.1	4.3	4,312	4,665
75th Percentile	352,100	376,700	24,600	15,520	*93.5	3.9	99.6	3.3	23,452	17,567
Mean	384,400	701,900	317,500	17,740	***54.8	2.0	***70.7	4.6	***163,548	27,438
Aggregate (Sum, in trillions)	49.83	88.43	38.60	2.26	***56.3	2.1	***71.8	4.7	***20.41	3.46

Note: Table gives net worth estimates from a sample of all SCF-like families in 2014 SIPP Wave 4 and all primary economic units in 2016 SCF, which are for calendar year 2016. These estimates are compared to comparable estimates from a sample of all SCF-like families in 2014 SIPP Wave 1 and all primary economic units in 2013 SCF, both of which are measured for calendar year 2013. SCF-like families include the primary family in a household, any unmarried partners of the household reference person, and all of that partner's children younger than age 25. SCF-like families exclude subfamilies within the primary family that are headed by someone age 25 or older and siblings and other relatives of the household reference person who are age 25 or older. The SIPP and SCF estimates are given in 2013 dollars, and the ratio is in percentage terms. The standard error for the difference was calculated using replicate weights from both surveys and the five imputation implicates for SCF. The SIPP standard errors were constructed through balanced repeated replication with Fay's adjustment factor of 0.5, and the SCF standard errors were constructed via bootstrapping. The standard error for the ratio was calculated using the delta method. Significance asterisks: *** p<.01, ** p<.05, * p<.1.

In mean and aggregate net worth estimates discrepancies between the SIPP and the SCF changed between data years 2013 and 2016. Median net worth for calendar year 2016 was $91,620 in the SIPP and $99,060 in the SCF, with a difference that is statistically different from zero in 2016. This is in contrast with the 2013 data's median net worth differences, which were not statistically different from zero. However, in the last column, the difference between the 2013 and 2016 net worth differences was not statistically different from zero due to the precision of the estimates. Therefore, while there was a change in the statistical significance between comparisons of the SIPP and the SCF in 2013 and 2016, we are unable to say that the discrepancy in median net worth was different between 2013 and 2016. To put it more simply, the difference in 2016 is within the margin of error of that difference seen in 2013—setting aside issues of correlation, we cannot say the median net worth observed in the two surveys are more or less different between the two observed calendar years; the difference is not statistically significant.

To examine how wealth estimates have changed throughout the distribution, we look at other percentiles as well. For the 25th percentile, the SIPP estimate of net worth was 48.2 percent of the SCF

estimate in 2016 and statistically significant from the SCF estimate. The 75th percentile was 92.5 percent of the SCF estimate in 2016 and was also statistically significantly different. The ratio in 2013 was 42.4 percent, which is not statistically different from the 2016 ratio. The mean was substantially lower, and statistically significantly different, in Wave 4 of the 2014 SIPP than in the 2016 SCF, where the SIPP estimate was 54.8 percent of the SCF estimate. The ratio for 2013 was 70.7 and is statistically different from and higher than the 2016 estimate. Aggregate wealth (the sum of wealth for the entire population) also fell from the 2013 ratio of 71.8 to 56.3 in 2016, with a statistically significant difference in difference (i.e. the difference between 2013 and 2016 in the difference between SCF and SIPP measures of aggregate wealth).

3.2 Benchmarking specific assets and debts

Next, we compare the SIPP and SCF estimates of ownership rates and median value conditional on ownership for the asset and debt components that make up net worth: (i) financial assets inside tax-preferred retirement accounts; (ii) financial assets outside tax-preferred retirement accounts; (iii) miscellaneous financial assets; (iv) unsecured debt; (v) equity in real estate; and (vi) equity in vehicles. We further break down ownership rates and median value by each category's subcomponents.

Retirement Accounts

Table 2 presents the results for tax-preferred retirement accounts, which consist of employer-sponsored plans (e.g., 401(k), 403(b), or Thrift plans) and Individual Retirement Accounts (IRAs) and Keogh plans. It lists estimates of ownership rates and median values conditional on ownership using Wave 4 of the 2014 SIPP and the 2016 SCF and presents the differences across surveys. Table 2 also lists the differences between Wave 1 of the 2014 SIPP and the 2013 SCF and then compares how the differences across surveys changed between 2013 and 2016.

Table 2: Financial Assets in Tax-Preferred Retirement Accounts

	2014 SIPP Wave 4 and 2016 SCF (Calendar Year 2016)				2014 SIPP Wave 1 and 2013 SCF (Calendar Year 2013)		SIPP and SCF (Calendar Year 2013 vs. 2016)	
Statistic	SIPP Estimate	SCF Estimate	Difference	Difference Standard Error	Difference	Difference Standard Error	Difference in Differences	Difference in Differences Standard Error
Ownership rates								
Total	51.71	52.06	0.35	0.74	-0.43	0.01	0.78	0.88
IRA/Keogh	28.40	29.93	**1.53	0.73	*1.08	0.01	0.45	0.85
Employer-Sponsored Plans	39.97	35.72	***-4.25	0.65	***-3.66	0.01	-0.59	0.84
Median value conditional on ownership								
Total	66,270	61,250	-5,020	3,653	-1,772	3,134	-3,248	4,770
IRA/Keogh	48,000	53,550	5,550	3,769	***9,767	3,102	-4,217	4,414
Employer-Sponsored Plans	50,000	43,370	***-6,630	2,543	***-12,973	2,408	*6,343	3,502

Note: Table gives net worth estimates from a sample of all SCF-like families in 2014 SIPP Wave 4 and all primary economic units in 2016 SCF, which are for calendar year 2016. These estimates are compared to comparable estimates from a sample of all SCF-like families in 2014 SIPP Wave 1 and all primary economic units in 2013 SCF, both of which are measured for calendar year 2013. SCF-like families include the primary family in a household, any unmarried partners of the household reference person, and all of that partner's children younger than age 25. SCF-like families exclude subfamilies within the primary family that are headed by someone age 25 or older and siblings and other relatives of the household reference person who are age 25 or older. The SIPP and SCF estimates are given in percentage terms. The standard error for the difference was calculated using replicate weights from both surveys and the five imputation implicates for SCF. The SIPP standard errors were constructed through balanced repeated replication with Fay's adjustment factor of 0.5, and the SCF standard errors were constructed via bootstrapping. Significance asterisks: *** p<.01, ** p<.05, * p<.1.

Measures of assets held in any tax-preferred retirement account were similar in the SIPP and the SCF in calendar year 2016, as they had been in calendar year 2013. According to the SIPP estimates from calendar year 2016, 51.7 percent of households had at least one tax-preferred retirement account, which is similar to the SCF estimate of 52.1 percent of households. The 2016 conditional median value of assets held in these accounts was $66,270 in the SIPP and $61,250 in the SCF. The difference between the SIPP and SCF estimates of the ownership rates and the difference between the conditional medians are not statistically significant. Additionally, the differences in calendar year 2016 were comparable to those in calendar year 2013.

While the ownership rate and value of assets held in any tax-preferred retirement account were similar in the SIPP and the SCF, there were statistically significant differences between estimates conditional on the types of plan. For employer-sponsored plans, ownership rates in calendar year 2016 were four percentage points higher in the SIPP than in the SCF, showing statistical significance. This is similar to estimates in calendar year 2013.

In calendar year 2016, the median value of IRA/Keogh accounts was $53,550 in the SCF and $48,000 in the SIPP, for a difference in median values of $5,550 which is not statically different. In calendar year 2013, this difference was $9,767, which is statistically different from zero. For employer-

sponsored plans, the difference in median values for calendar year 2016 was -$6,630; the SIPP estimate is statistically higher than the SCF estimate. The estimated difference observed in calendar year 2013 was -$12,973, which is also statistically significant. In summary, while the SIPP and SCF continue to have statistically significant differences when 401(k) and IRA accounts are considered individually, these differences disappear when defined contribution retirement accounts are combined into one category. And when looking at the difference in differences, these statistical differences highlighted above are not new; they are statistically the same difference as observed in the past.

Financial Assets Outside of Retirement Accounts

Table 3 presents the results for financial assets outside of retirement accounts, such as bank accounts, directly owned bonds, and shares of stocks. For savings accounts, the SCF classifies education savings accounts, such as a 529 plan, as a type of savings account. Because of this, for the 2014 SIPP Panel, we include data on 529 plans in our savings account variable.

Table 3: Financial Assets Outside Tax-Preferred Retirement Accounts

	2014 SIPP Wave 4 and 2016 SCF (Calendar Year 2016)				2014 SIPP Wave 1 and 2013 SCF (Calendar Year 2013)		SIPP and SCF (Calendar Year 2013 vs. 2016)	
Statistic	SIPP Estimate	SCF Estimate	Difference	Difference Standard Error	Difference	Difference Standard Error	Difference in Differences	Difference in Differences Standard Error
Ownership rates								
Total	89.03	92.32	***3.29	0.42	***6.49	0.39	***-3.17	0.53
Bank Accounts	88.91	92.17	***3.26	0.42	***6.49	0.40	***-3.20	0.54
Checking Accounts	85.37	86.57	**1.20	0.49	***5.49	0.48	**-4.29	0.63
Savings Accounts	65.20	51.09	***-14.11	0.71	***-12.04	0.76	-2.07	0.94
Money market deposit accounts	11.36	14.21	***2.85	0.51	***1.85	0.46	1.00	0.63
Certificates of deposit (CDs)	5.84	6.51	**0.67	0.33	0.13	0.39	0.54	0.46
Bonds (Other Interest Earning Assets)	7.99	9.64	***1.65	0.35	***2.20	0.43	***-0.54	0.52
Stocks and Mutual Funds	18.26	19.80	***1.54	0.54	-0.78	0.50	***2.32	0.66
Median value conditional on ownership								
Total	6,000	6,801	**801	322	-27	299	828	397
Bank Accounts	5,000	5,548	**548	260	359	227	189	366
Checking Accounts	1,943	2,282	**339	163	***491	1	-152	162
Savings Accounts	3,000	4,734	***1,734	274	***1,452	249	**282	363
Money market deposit accounts	16,000	24,430	***8,430	2,298	***14,502	1,896	***-6,072	2,757
Certificates of deposit (CDs)	13,200	20,360	***7,160	2,707	**-7,875	3,185	15,035	3,873
Bonds (Other Interest Earning Assets)	4,500	1,527	***-2,973	898	***-1,507	281	-1,466	923
Stocks and Mutual Funds	49,000	57,210	8,210	6,062	*7,601	4,411	***609	7,070

Note: Table gives net worth estimates from a sample of all SCF-like families in 2014 SIPP Wave 4 and all primary economic units in 2016 SCF, which are for calendar year 2016. These estimates are compared to comparable estimates from a sample of all SCF-like families in 2014 SIPP Wave 1 and all primary economic units in 2013 SCF, both of which are measured for calendar year 2013. SCF-like families include the primary family in a household, any unmarried partners of the household reference person, and all of that partner's children younger than age 25. SCF-like families exclude subfamilies within the primary family that are headed by someone age 25 or older and siblings and other relatives of the household reference person who are age 25 or older. The SIPP and SCF estimates are given in percentage terms. The standard error for the difference was calculated using replicate weights from both surveys and the five imputation implicates for SCF. The SIPP standard errors were constructed through balanced repeated replication with Fay's adjustment factor of 0.5, and the SCF standard errors were constructed via bootstrapping. Significance asterisks: *** p<.01, ** p<.05, * p<.1.

Ownership rates and median values of financial assets outside tax-preferred retirement accounts are typically smaller in the SIPP than in the SCF. According to the SIPP estimates from calendar

year 2016, 89 percent of households had financial assets outside of tax-preferred retirement accounts, which is smaller than the SCF estimate of 92.3 percent of households. This difference of 3.3 percentage points in calendar year 2016 declined from a 6.5 percentage point difference in calendar year 2013. The conditional median value of assets held in these accounts was $6,000 in the SIPP and $6,801 in the SCF for calendar year 2016, a statistically significant difference. Between calendar years 2013 and 2016, the difference in the medians went from -$27 to $801. The 2016 difference is now statistically significant, although the difference in difference is not statistically significant.

In addition to these changes in the aggregated ownership rate and the conditional median, there were also changes in the specific components of financial assets outside tax-preferred accounts. The 2016 SIPP ownership rate for savings accounts was 65.2 percent, compared with 51.1 percent of SCF households. This 14 percentage point difference is the largest among the components of financial assets outside tax-preferred retirement accounts.

One area where we have seen a convergence between the SIPP and the SCF is for bank accounts, specifically checking accounts. In calendar year 2016, the SIPP ownership rate for bank accounts was 88.9 percent, compared to 92.2 percent of SCF households. This difference of 3.3 percentage points is in contrast with the 6.5 percentage point difference in calendar year 2013. The change in checking accounts is even smaller. In calendar year 2016, the SIPP ownership rate for checking accounts was only 1.2 percentage points lower than the SCF estimate. In contrast, a 5.5 percentage point difference was observed in calendar year 2013.

Miscellaneous Financial Assets

Table 4 presents the results comparing miscellaneous assets between the SIPP and the SCF. Our measure for both SIPP and SCF of miscellaneous assets consists of data from less-commonly owned assets and data from a catch-all question which asks respondents to report about any remaining assets they have not yet reported to the interviewer. For the SCF and the 2014 SIPP, miscellaneous assets

include positive business equity[10], annuities and trusts, and cash value of life insurance plans. When an asset is not explicitly asked about in the 2014 SIPP, respondents are expected to include it in their response for "Other financial investments" (SIPP wording).

Table 4: Miscellaneous Financial Assets

	2014 SIPP Wave 4 and 2016 SCF (Calendar Year 2016)				2014 SIPP Wave 1 and 2013 SCF (Calendar Year 2013)		SIPP and SCF (Calendar Year 2013 vs. 2016)	
Statistic	SIPP Estimate	SCF Estimate	Difference	Difference Standard Error	Difference	Difference Standard Error	Difference in Differences	Difference in Differences Standard Error
Ownership rates								
Total	32.77	38.79	***6.02	0.63	***6.60	0.64	-0.58	0.85
Annuities	3.98	3.97	-0.01	0.27	0.21	0.26	-0.23	0.35
Trusts	1.39	1.68	0.29	0.18	-0.02	0.17	0.31	0.23
Cash Life Insurance	19.83	19.40	-0.43	0.55	0.71	0.56	-1.14	0.73
Business Equity (Positive)	12.10	11.45	-0.65	0.44	***-1.48	0.42	0.83	0.53
Other financial assets	2.71	13.58	***10.87	0.42	***10.62	0.41	0.25	0.57
Median value conditional on ownership								
Total	20,000	21,340	1,340	1,915	-2,759	1,903	4,099	2,602
Annuities	67,000	101,800	***34,800	13,030	**23,711	11,340	11,089	17,416
Trusts	300,000	188,300	**-111,700	55,460	***153,216	49,924	***-264,916	73,067
Cash Life Insurance	13,000	8,857	***-4,143	1,442	***-4,296	1,301	153	1,876
Business Equity (Positive)	10,800	105,400	***94,600	10,620	***85,000	6,341	9,600	12,358
Other financial assets	15,000	10,080	**-4,920	2,103	***-20,047	5,841	***15,127	4,457

Note: Table gives net worth estimates from a sample of all SCF-like families in 2014 SIPP Wave 4 and all primary economic units in 2016 SCF, which are for calendar year 2016. These estimates are compared to comparable estimates from a sample of all SCF-like families in 2014 SIPP Wave 1 and all primary economic units in 2013 SCF, both of which are measured for calendar year 2013. SCF-like families include the primary family in a household, any unmarried partners of the household reference person, and all of that partner's children younger than age 25. SCF-like families exclude subfamilies within the primary family that are headed by someone age 25 or older and siblings and other relatives of the household reference person who are age 25 or older. The SIPP and SCF estimates are given in percentage terms. The standard error for the difference was calculated using replicate weights from both surveys and the five imputation implicates for SCF. The SIPP standard errors were constructed through balanced repeated replication with Fay's adjustment factor of 0.5, and the SCF standard errors were constructed via bootstrapping. Significance asterisks: *** p<.01, ** p<.05, * p<.1.

In Table 4, the ownership rate for overall miscellaneous financial assets is lower in the SIPP than in the SCF. In calendar year 2016, the SIPP ownership rate of miscellaneous assets was 32.8 percent of households, compared with 38.8 percent of SCF households. This 6.0 percentage point difference in ownership rates in calendar year 2016 is not statistically different from the 6.6 percentage point difference between the SIPP and the SCF in calendar year 2013. The median value conditional on ownership is larger in the 2016 SCF than in Wave 4 of the 2014 SIPP, though not statistically different. The conditional median is $20,000 in the SIPP and $21,340 in the SCF. This difference of $1,340 in calendar year 2016 was closer to zero than the difference of -$2,759 in calendar year 2013. In other

[10] Czajka et al. (2003) discusses that SCF asks respondents how much they would receive if they sold their share of a business. By construction, this SCF variable cannot be negative. Because of this, we only code a SIPP respondent as having a business if his or her business equity is positive.

words, while the SIPP estimate is lower than the SCF estimate in 2016, this disparity was even larger in terms of absolute value in 2013.

Among the subcomponents of miscellaneous financial assets, ownership rates for annuities, trusts, cash life insurance, and positive business equity were not statistically different between the SIPP and SCF in calendar year 2016. However, the ownership rate in calendar year 2016 for other financial assets captured from a catch-all question was 2.7 percent of households in the SIPP compared with 13.6 percent of households in the SCF. These gaps in ownership rates between the SIPP and the SCF in calendar year 2016 were not statistically different from the differences in calendar year 2013. Even though the question text about other financial assets was revised between the 2008 SIPP and the 2014 SIPP to include additional examples of other assets, the ownership rates in the SIPP continue to be much smaller than in the SCF, which helps explain the large swing in values we see.

In 2016 the conditional median values of specific assets were smaller in the SIPP than in the SCF for some assets. In particular, the median value of annuities was $67,000 in the SIPP and $101,800 in the SCF for calendar year 2016, and the median positive business equity was $10,800 in the SIPP and $105,400 in the SCF. However, the median values of assets in trust, the cash value of life insurance, and other financial assets were higher in the SIPP than in the SCF in calendar year 2016.

Unsecured Debt

Table 5 presents estimates for unsecured debt, which consists of revolving credit card debt, student loans, and any other residual debt. For the overall category, 51.6 percent of households in the SIPP held unsecured debt in calendar year 2016, compared with 57.6 percent of SCF households. In calendar year 2016, the conditional median was $8,000 in the SIPP and $7,307 in the SCF. Comparing the estimates from calendar year 2016 to the estimates from calendar year 2013, the difference in the SIPP and SCF ownership rates increased from 2.7 to 5.9 percentage points, and the difference in conditional median values changed from -$1,726 to -$693.

Table 5: Unsecured Debt

Statistic	2014 SIPP Wave 4 and 2016 SCF (Calendar Year 2016)				2014 SIPP Wave 1 and 2013 SCF (Calendar Year 2013)		SIPP and SCF (Calendar Year 2013 vs. 2016)	
	SIPP Estimate	SCF Estimate	Difference	Difference Standard Error	Difference	Difference Standard Error	Difference in Differences	Difference in Differences Standard Error
Ownership rates								
Total	51.63	57.56	***5.93	0.72	***2.68	0.75	***3.25	0.97
Credit Cards	40.19	43.90	***3.71	0.72	-0.01	0.69	***3.72	0.92
Student Loans	16.96	22.27	***5.31	0.63	***2.63	0.51	***2.68	0.77
Residual Debt	14.73	12.75	***-1.98	0.49	***13.77	0.61	***-15.75	0.73
Median value conditional on ownership								
Total	8,000	7,307	***-693	240	***-1,726	359	**1,033	432
Credit Cards	3,936	2,321	***-1,615	268	***-1,211	240	-404	325
Student Loans	20,000	19,340	-660	1,070	*-2,358	1,349	1,698	1,605
Residual Debt	3,700	3,828	128	471	***-3,695	516	***3,823	645

Note: Table gives net worth estimates from a sample of all SCF-like families in 2014 SIPP Wave 4 and all primary economic units in 2016 SCF, which are for calendar year 2016. These estimates are compared to comparable estimates from a sample of all SCF-like families in 2014 SIPP Wave 1 and all primary economic units in 2013 SCF, both of which are measured for calendar year 2013. SCF-like families include the primary family in a household, any unmarried partners of the household reference person, and all of that partner's children younger than age 25. SCF-like families exclude subfamilies within the primary family that are headed by someone age 25 or older and siblings and other relatives of the household reference person who are age 25 or older. The SIPP and SCF estimates are given in percentage terms. The standard error for the difference was calculated using replicate weights from both surveys and the five imputation implicates for SCF. The SIPP standard errors were constructed through balanced repeated replication with Fay's adjustment factor of 0.5, and the SCF standard errors were constructed via bootstrapping. Significance asterisks: *** p<.01, ** p<.05, * p<.1.

Among the subcomponents of unsecured debt, in calendar year 2016, about 40 percent of SIPP households had credit card debt compared with about 44 percent of SCF households, a statistically significant difference. The rate of having student loan debt was slightly lower in the SIPP than in the SCF—17.0 percent compared with 22.3 percent of households. The difference between the SIPP and SCF estimates of ownership of residual debt declined markedly from 13.8 percentage points in calendar year 2013 to -2.0 percentage points in 2016. Although not presented in Table 5, the decline in differences across surveys between 2013 and 2016 is primarily due to a decrease in the SCF estimate.

Equity in Real Estate

Table 6 presents the results for real estate, which includes people's primary residences as well as rental homes, time shares, and undeveloped lots. In 2016, fewer households owned real estate in the SIPP than in the SCF. In the SIPP, 64.1 percent of households owned real estate, compared with 66.3 percent of households in the SCF. This difference of 2.2 percentage points in calendar year 2016 is not statistically different from the 2.5 percentage point difference in calendar year 2013.

Table 6: Equity in Real Estate

Statistic	2014 SIPP Wave 4 and 2016 SCF (Calendar Year 2016)				2014 SIPP Wave 1 and 2013 SCF (Calendar Year 2013)		SIPP and SCF (Calendar Year 2013 vs. 2016)	
	SIPP Estimate	SCF Estimate	Difference	Difference Standard Error	Difference	Difference Standard Error	Difference in Differences	Difference in Differences Standard Error
Ownership rates								
Total	64.07	66.27	***2.20	0.41	***2.46	0.34	-0.26	0.38
Primary Residence	62.36	63.70	***1.34	0.37	***1.93	0.29	*-0.59	0.33
Primary Residence Debt	37.98	41.87	***3.89	0.58	***3.62	0.55	0.27	0.73
Rental Property and Other Real Estate	12.58	17.21	***4.63	0.47	***4.40	0.48	0.23	0.62
Rental Property and Other Real Estate Debt	5.89	5.62	-0.27	0.32	***-0.95	0.33	0.68	0.42
Median value conditional on ownership								0.00
Total equity	110,100	106,700	-3,400	4,251	-817	2,830	-2,583	5,069
Primary Residence	200,000	188,900	**-11,100	4,452	-5,791	4,159	-5,309	5,760
Primary Residence Debt	123,000	113,000	**-10,000	4,280	**-5,336	2,412	-4,664	4,891
Rental Property and Other Real Estate	150,000	121,000	***-29,000	9,852	***-53,690	9,129	*24,690	12,927
Rental Property and Other Real Estate Debt	112,000	101,400	-10,600	10,970	**-20,419	9,574	9,819	13,841

Note: Table gives net worth estimates from a sample of all SCF-like families in 2014 SIPP Wave 4 and all primary economic units in 2016 SCF, which are for calendar year 2016. These estimates are compared to comparable estimates from a sample of all SCF-like families in 2014 SIPP Wave 1 and all primary economic units in 2013 SCF, both of which are measured for calendar year 2013. SCF-like families include the primary family in a household, any unmarried partners of the household reference person, and all of that partner's children younger than age 25. SCF-like families exclude subfamilies within the primary family that are headed by someone age 25 or older and siblings and other relatives of the household reference person who are age 25 or older. The SIPP and SCF estimates are given in 2013 dollars. The standard error for the difference was calculated using replicate weights from both surveys and the five imputation implicates for SCF. The SIPP standard errors were constructed through balanced repeated replication with Fay's adjustment factor of 0.5, and the SCF standard errors were constructed via bootstrapping. Significance asterisks: *** p<.01, ** p<.05, * p<.1.

The SIPP ownership rate for primary residences was close to the SCF estimate, although the SCF estimate was higher by about 1.3 percentage points in calendar year 2016. For rental property and other real estate, the SIPP ownership rate was 12.6 percent of households for calendar year 2016, compared with 17.2 percent of households in the SCF. Between calendar years 2013 and 2016, the share of households with rental property and other real estate debts converged. The difference between the SIPP and SCF estimates decreased from -1 percentage point in 2013 to -0.3 percentage points in 2016, the latter of which is not statistically significant.

Equity in real estate is equal to the value of a primary residence, rental property, and other real estate minus debt secured by the primary residence and debt for rental property and other real estate. For overall equity in real estate, there was no statistically significant difference in the median value conditional on ownership. The median value for 2016 was $110,100 in the SIPP and $106,700 in the SCF. This difference of -$3,400 in calendar year 2016 is not statistically different from the -$817 difference in calendar year 2013. The estimates for primary residence values and primary residence debt were slightly higher in the SIPP. In contrast, rental property and other real estate values were much larger in the SIPP than in the SCF. This pattern, along with lower ownership rates in the SIPP,

suggest that the SIPP might be missing ownership of other real estate and rental property that are toward the lower end of resale values.

Equity in Vehicles

Table 7 presents the results for equity in vehicles. In SIPP, 82.7 percent of households owned vehicles in calendar year 2016, compared with 85.2 percent of SCF households. This difference of 2.5 percentage points in calendar year 2016 is nearly identical to the 2.3 percentage point difference in calendar year 2013.

Table 7: Equity in Vehicles

	2014 SIPP Wave 4 and 2016 SCF (Calendar Year 2016)				2014 SIPP Wave 1 and 2013 SCF (Calendar Year 2013)		SIPP and SCF (Calendar Year 2013 vs. 2016)	
Statistic	SIPP Estimate	SCF Estimate	Difference	Difference Standard Error	Difference	Difference Standard Error	Difference in Differences	Difference in Differences Standard Error
Ownership rates								
Vehicles	82.70	85.23	***2.53	0.55	***2.30	0.46	0.23	0.68
Vehicle Debt	34.42	34.13	-0.29	0.67	*-1.13	0.64	0.84	0.88
Median value conditional on ownership								0.00
Total equity	6,025	12,150	***6,125	220	***4,189	236	***1,936	5069
Vehicles	11,740	17,350	***5,610	344	***4,055	213	***1,555	388
Vehicle Debt	13,000	13,000	0	333	-499	624	499	632

Note: Table gives net worth estimates from a sample of all SCF-like families in 2014 SIPP Wave 4 and all primary economic units in 2016 SCF, which are for calendar year 2016. These estimates are compared to comparable estimates from a sample of all SCF-like families in 2014 SIPP Wave 1 and all primary economic units in 2013 SCF, both of which are measured for calendar year 2013. SCF-like families include the primary family in a household, any unmarried partners of the household reference person, and all of that partner's children younger than age 25. SCF-like families exclude subfamilies within the primary family that are headed by someone age 25 or older and siblings and other relatives of the household reference person who are age 25 or older. The SIPP and SCF estimates are given in 2013 dollars. The standard error for the difference was calculated using replicate weights from both surveys and the five imputation implicates for SCF. The SIPP standard errors were constructed through balanced repeated replication with Fay's adjustment factor of 0.5, and the SCF standard errors were constructed via bootstrapping. Significance asterisks: *** p<.01, ** p<.05, * p<.1.

Median equity conditional on owning vehicles was $6,025 in the SIPP and $12,150 in the SCF for calendar year 2016. This is mostly explained by the difference in vehicle values (a difference of $5,610) rather than vehicle debt (a difference of $0). In calendar year 2013, the SIPP estimates for vehicle values were also lower than the SCF estimates; the difference in median values conditional on ownership was $4,055 in 2013.

Both surveys use data from J.D. Power to assign vehicle values based on reported year, make, and model. Given the two surveys have a similar methodology for creating vehicle values, it is surprising that median vehicle values are different between the SIPP and the SCF. However, the SIPP uses a

vehicle's average trade-in value, while the SCF uses a vehicle's retail value. Since retail value is typically larger than trade-in value, by construction, the same reported data in the SIPP and the SCF would generate smaller median vehicle values in the SIPP than in the SCF.

4. Discussion and Conclusion

In the 2014 Panel, the SIPP underwent numerous revisions that affected wealth measurement. Eggleston and Gideon (2017) find that questionnaire changes implemented in calendar year 2013 data were associated with SIPP estimates being closer to the SCF estimates when compared to prior panels, although numerous discrepancies remained. In this paper, we look at data from three years later in 2016 to see how the match between the SIPP and the SCF changed. Overall, most of the differences between the SCF and the SIPP in calendar year 2016 were not statistically significant to the differences in calendar year 2013.

The most notable change is that there is now a statistically significant difference between the SIPP and SCF estimates of median household net worth. While our estimates of the differences in net worth at various percentiles were not precise enough to find a statistically significant change in the difference between the SCF and the SIPP, the difference in the SIPP and SCF estimates of mean net worth increased between 2013 and 2016. Thus, while the evidence is somewhat mixed, it appears that the SIPP's estimate of the net worth distribution for calendar year 2016 doesn't match quite as well to the SCF as it did in 2013. The reasons for this are unclear. There was no notable questionnaire change between Wave 1 and Wave 4 of SIPP 2014, so it doesn't appear that the question wording is driving this difference. While attrition in the SIPP Panel could lead to a less representative sample, an indicator of owning any assets in the prior year is used in the weighting algorithm in subsequent waves, so it's not clear how attrition or weighting could be driving this result either.

For the subcomponents of household net worth, one notable change is the increase in the discrepancy in median vehicle equity between the SIPP and the SCF, which changed by almost $2,000 (Table 7). While the methodology for assigning vehicle values remained constant in the two surveys during this time, this result could be due to a divergence in vehicle retail values (which the SCF uses) and trade-in values (which the SIPP uses). Thus, because vehicles are a common household asset, this difference in vehicle assignment methodology could partially explain the divergence in the net worth estimates.

Another notable difference is that in calendar year 2016 the SIPP's estimate of bank account ownership was closer to the SCF's estimate, although the median value conditional on ownership diverged (Table 3). Because these two factors would influence net worth in opposite directions (higher ownership rates could increase net worth, but lower median values would decrease it), it's unclear how the change in bank account estimates affects net worth.

Given the SIPP data's importance and uncommon depth of wealth related details, it is important to understand the impact of the 2014 Panel redesign over time. With few exceptions, most measures of the 2014 SIPP Panel remained of consistent quality from Wave 1 to Wave 4 when compared to the 2013 and 2016 SCF. These few notable exceptions include the estimates of median value of trusts and mean net worth, both of which show meaningful and substantial difference in difference between years and surveys that is not easily explained, as well as a divergence in vehicle values. However, most measures have been largely unaffected over the two waves and have consistent measures of wealth.

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Appendix A: Statistical Comparisons

To construct our point estimates and standard errors for the SIPP and SCF estimates, we must account for the imputation of missing data in the SCF and the complex sample design of both the SCF and the SIPP. In both the SIPP and the SCF, many asset and debt values are imputed. To account for uncertainty due to imputation, the SCF uses multiple imputation as described by Rubin (1987), in which observations with missing data are imputed five different values, allowing a researcher to see how the point estimates change with different sets of missing values. For the SCF, we utilize all 5 implicates of missing data when computing wealth estimates to account for uncertainty due to item non-response. We denote an estimate using implicate i and the main sample weight in the SCF by $\hat{\beta}_{0,i}^{SCF}$. We average these estimates across all implicates to construct point estimates. We denote these point estimates by

$$\hat{\mu}^{SCF} = \frac{1}{5}\sum_{i=1}^{5} \hat{\beta}_{0,i}^{SCF}.$$

We compare $\hat{\mu}^{SCF}$ to $\hat{\mu}^{SIPP}$, the corresponding SIPP point estimate which accounts for sample weights.

In addition, both the SCF and the SIPP use a complex sampling design in which observations are selected with differing probabilities. Because this feature violates the simple random sample assumption underlying the standard formulas for variance estimates, we use replicate weights to account for the complex sample designs of the SCF and the SIPP. We estimate standard errors via

balanced repeated replication (BRR) with the 240 replicate weights in the SIPP data[11] and the 999 replicate weights constructed for the first implicate in the SCF data. We denote the SIPP estimate of the wealth statistic based on replicate weight r by $\hat{\beta}_r^{SIPP}$ and the SCF estimate of the wealth statistic based on replicate weight r by $\hat{\beta}_{r,1}^{SCF}$.[12] In SIPP, $\hat{\beta}_0^{SIPP} = \hat{\mu}^{SIPP}$ since replicate weight 0 is the final full sample weight. Based on Fay and Train (1995), the formula for the standard error of a SIPP estimate is

$$\hat{\sigma}_E^{SIPP} = \sqrt{\frac{4}{R^{SIPP}} \sum_{r=1}^{R^{SIPP}} \left(\hat{\beta}_r^{SIPP} - \hat{\beta}_0^{SIPP} \right)^2},$$

in which R^{SIPP} equals 240. Based on Rubin (1987) and Board of Governors of the Federal Reserve System (2017), the formula for the standard error of a SCF estimate is

$$\hat{\sigma}_E^{SCF} = \sqrt{\left(1 + \frac{1}{5}\right)\left(\frac{1}{4}\right)\sum_{i=1}^{5}\left(\hat{\beta}_{0,i}^{SCF} - \frac{1}{5}\sum_{i=1}^{5}\hat{\beta}_{0,i}^{SCF}\right)^2 + \frac{1}{998}\sum_{r=1}^{999}\left(\hat{\beta}_{r,1}^{SCF} - \frac{1}{999}\sum_{j=1}^{999}\hat{\beta}_{j,1}^{SCF}\right)^2}.$$

For ease of exposition, we often refer to the difference in point estimates between the surveys, $\hat{\mu}^{SCF} - \hat{\mu}^{SIPP}$. Since the SCF and the SIPP are independent samples, the standard error of this difference is

$$\sqrt{(\hat{\sigma}_E^{SIPP})^2 + (\hat{\sigma}_E^{SCF})^2}.$$

When comparing the difference in difference for the SIPP and SCF estimates between 2016 and 2013, we account for the covariance between Wave 1 and Wave 4 SIPP estimates, since households interviewed in Wave 4 were also interviewed in Wave 1. We occasionally find it useful to cite the ratio

[11] When estimating standard errors for the SIPP data, we apply Fay's method with a perturbation factor of $k = 0.5$, as the replicate weights were created with this parameter value (U.S. Census Bureau 2016).
[12] The SCF only constructs replicate weights for the first implicate of imputed data.

of a SIPP estimate to an SCF estimate, $\hat{\mu}^{SIPP}/\hat{\mu}^{SCF}$. We use the multivariate delta method to construct the standard errors, given by

$$\sqrt{\left(\frac{1}{\hat{\mu}^{SCF}}\right)^2 (\hat{\sigma}_E^{SIPP})^2 + \left(\frac{-\hat{\mu}^{SIPP}}{\hat{\mu}^{SCF^2}}\right)^2 (\hat{\sigma}_E^{SCF})^2}.$$

Appendix B Statistical Disclaimers

Statistics from surveys are subject to sampling and nonsampling error. For further information on the source of the data and accuracy of the estimates, including standard errors and confidence intervals, see < http://www.census.gov/programs-surveys/sipp/tech-documentation/source-accuracy-statements.html >. All comparative statements in this report have undergone statistical testing, and, unless otherwise noted, all comparisons are statistically significant at the 10 percent significance level.