Households' Capital Account: Investment, Gross and Net Savings in the NIPA

Anthony Bonen

Economics Department, New School for Social Research

bonea539@newschool.edu

Abstract

We recreate the NIPA adjustments pioneered by Ruggles and Ruggles (1992) for the period 1947-2012 and reconfirm their results: household net lending to other sectors is counter-cyclical and is a small fraction private firms' gross capital formation (GCF). To test the causal role of household Net Savings in terms of GCF and GDP growth, a VEC model is estimated. The VECM is cointegrated stationary for the three annual time series, but exogeneity testing shows household Net Savings is exogenous. We argue this is evidence of inter-secotral investment demand as driving feature of growth.

JEL classification: E01, E12, E21
Keywords: Household Savings, National Accounts, Investment

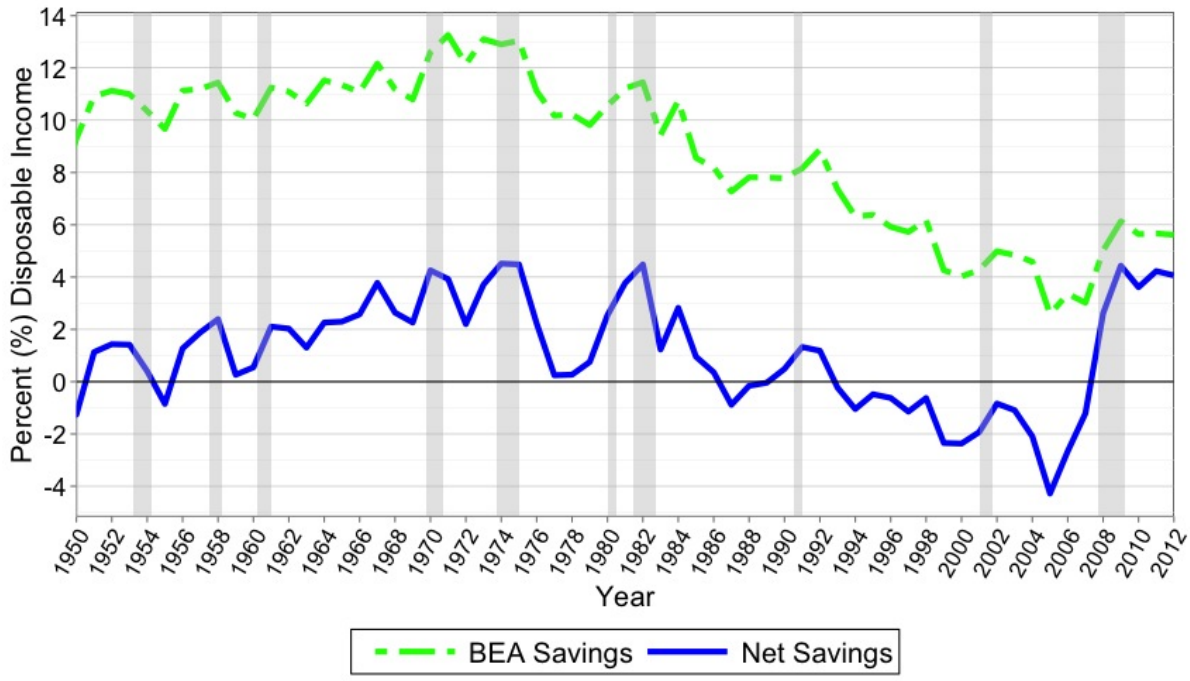
1 Introduction

The National Income and Product Accounts (NIPA) in the United States (US) and other major economies (e.g., Australia, Canada, the United Kingdom) are structured such that the macroeconomic data for the household sector conforms to a simplified view of domestic economic behaviour. In accordance with standard economic theory, households in NIPA are: (i) barred from investing in themselves directly, and; (ii) act *as if* in-kind and implicit income are part of their budget sets. To meet these two theoretical requirements the Bureau of Economic Analysis (BEA) employs a myriad of accounting transformations to the raw data. Although useful for certain endeavours, standard national accounting practices serve to obscure actual households' self-investment and capital formation activities. It is important for researchers and policymakers to have access to alternative configurations of macroeconomic data that can shed light on otherwise enveiled economic behaviour. To that end this paper reconstructs US household income and spending from NIPA to delineate the sector's internal investments, capital formation and, by extension, actual savings.

The accounting adjustments employed here were first deduced in Ruggles and Ruggles (1992) in what the authors referred to as a 'market transaction view' of savings and

capital formation. Indeed a key element of their approach is to treat households as self-investors engaged in capital formation within the household sector. Household capital formation is a particularly helpful in highlighting the sector's unsustainable mortgage borrowing leading up to the 2008 global financial crisis. As elaborated in Section 2, internal capital formation includes net housing purchases, home improvements and the purchase of durable goods; as such it equals the difference between households' gross and net savings. Net savings, NS_t, appear to have been a key indicator of fragility in the US economy. This is because net savings represent either households' supply of investible funds to the rest of the economy (if $NS_t > 0$) or their net borrowing from, primarily, banks (for $NS_t < 0$). Although the BEA's figure for household savings as a proportion of disposable income declined during the 'Great Moderation', our reconstructed series for households' net savings was falling *and* persistently negative from 1993 through 2007 (see Figure 1).[1] Thus, not only is our net savings data unprecedented for the post-War era, it is also demonstrably and undeniably unsustainable. The latter cannot be said for the BEA's measure of household savings.

Figure 1: Household Saving Rates: BEA vs reconstructed Net Savings



Author's calculations. Shaded regions indicate US recessions. Note the numerators of the data series differ since different gross (and disposable) incomes are used for the two savings figures.

[1] The finding of aggregate dissavings (read: net borrowing) of the household sector accords with survey and other microeconomic data.

Figure 1 plots annual net savings as proportion of disposable income.[2] The net rate of savings presented here holds insights for both household decision-making and about the transmission mechanisms between aggregate savings and investment. Regarding the former, the net savings rate appears to be counter-cyclical: it rises before and through recessions before falling back to very low levels during the upswing. A noticeable exception, however, is slow secular rise in the savings rate through the relatively stable growth of the 1960s. The overall counter-cyclical pattern is most pronounced from 1980 onwards. As we discuss in section 3.1 the pattern is perfectly understandable from the point of view of household capital formation: during lean years households hold back on new purchases and instead "consume" a greater share of their existing capital (e.g., appliances, cars, etc.).

The second apparent inference from Fig. 1 is that the net saving rate is relatively small and, in recent years, often negative. In standard macroeconomic theory the pool of savings flowing from households to the private sector acts as a supply constraint on investment funding. In part 3.2 we provide an overview of how the dominance of loanable funds theory instills savings with causal priority in savings-investment equalization process. Section 4 empirically debunks the investment-adjusts-to-savings belief insofar as it relates to households' private savings. This non-adjustment is demonstrated through an error correction model relating private sector capital formation, the level of economic activity and household net savings. Although these three series covary, net savings are shown to be an exogenous component of the system meaning they are inconsequential in explaining both GDP and investment. The implications is that households are passively responding to these two, much larger drivers of the economy. Before turning to these issues, Section 2 details the national accounting adjustments necessary to reconstruct the household sector as engaged in capital formation.

2 Deriving Households' Capital Account

The accounting adjustments applied to the NIPA are based on the work of Ruggles and Ruggles (1992). The authors recover figures for the gross capital formation of households and investigate Simon Kuznet's data on investment in seven private industry sectors. In each case they find that investment levels in the post-War period (through 1989) were almost entirely attributable to each sector's retrained earnings. Though the expansion and deepening of financial markets since the time of their writing has likely altered some of the patterns of investment, no one (to the best of our knowledge) has updated their

[2]The savings rate related to our Net Savings measure is relative to the adjusted disposable income made by the author, not the BEA measure. This is necessary since net saving is based on the difference between income and expenditures adjusted according to the methodology laid out in Ruggles and Ruggles (1992). Conversely, the BEA saving rate values in Fig. 1 are based on the BEA measure of disposable income, i.e. Table 2.1 line 27.

accounting adjustments for the household sector. In so doing we confirm their finding that the household sector has provided little, if any, of the funds needed for private sector investment through the post-War era (Ruggles and Ruggles 1992, p. 126).[3] The Ruggles' recovery of, and the present update to, household gross savings and capital formation leads to evidence that challenges both standard consumer saving behaviour hypotheses and the simple precepts of the saving-investment connection common in macroeconomic theory.

To determine households' direct capital formation and net lending four types of adjustment must be made to the NIPA. First, the income and outlays of non-profit institutions primarily serving households (NPISHs) must be removed from the NIPA's "Households and NPISHs" category. Typically, this conjoined group is reported as *the* household sector. Secondly, employer contributions to and interest earnings on private and public pension funds are treated as current household income. To avoid double-counting, aggregate NIPA income does not include actual pension benefits paid to retirees. To obtain real income and outflows this accounting practice must be reversed. Next, owner-occupied houses are treated in the national accounts as fictional, unincorporated firms. These accounting fictions operate as a placeholder for homeowners' real estate capital account. Correcting for this practice necessitates a household capital account which includes capital purchases (e.g., new homes) and depreciation estimates. Finally, durable goods are considered, along with housing, as part of households' capital. Therefore, purchases must be deducted from the current expenditures and added to capital purchases. As with housing, an estimate of annual depreciation/use-value must be added to the current budget of the household sector.[4] As we shall see, household capital formation accounts for the lion's share of households' savings, making it an essential element in household spending and savings behaviour.

Table 1 presents the Ruggles-style adjustments for the latest available data, 2012. From 1992 onwards the BEA provides separate annual accounts for households *per se* and NPISHs (BEA Table 2.9). Therefore the multiple sub-category adjustments performed by Ruggles & Ruggles are not necessary for 1992-2012 data. The figures reported in Table 1 are simply the difference between total personal income and outlays (BEA Table 2.1) and the corresponding figures for households alone.[5] Unfortunately, we are unable to exactly

[3]They conclude that there was, in aggregate, net borrowing by the household sector from 1947-1989 (equal to -1.2% of private sector capital formation). The adjusted data we have calculated, however, finds positive net saving (i.e., net lending) by the household sector over this period. The differences between our data and the Ruggles' seem to be due to the BEA's perennial revisions of historical accounts.

[4]Notably, durable goods purchases by business are treated as capital formation against which capital consumption charges are estimated. Thus, if a company buys a car for an employee NIPA treats it as capital formation; if the firm pays the individual to purchase the car for herself, it is treated as current consumption.

[5]Since Households and NPISHs engage in transactions – hiring and purchasing goods from one another – the NPISHs income and outlays cannot be directly deducted form total personal income and outlays without accounting for intra-sectoral flows.

recreate the sub-category adjustments for the original vintage data (see Appendix B, lines 3 and 4). Therefore, for years prior to 1992, total NIPA incomes and outlays are scaled by the 1992-2012 average ratios.[6] Note that for 2012, household income was greater than the NIPA total, hence the non-profit income deduction adds to household income (+$7.2). Total outlays, however, were greater than the outlays of household alone and we therefore deduct $74.2 billion from the reported annual total for gross expenditures ($13,056.4).

Secondly, we must adjust NIPA data for actual pension incomes of households. In 2013, households' pension income in the national accounts of Australia, Canada and the United States (and the UK as of 2014) were changed to reflect employers' liabilities, rather than actual pension contributions. In other words, the variable cash contributions of employers to defined benefit plans have now been replaced with the contractual increases in future obligations whether or not those are met with current monies or internal IOUs. Although this is the most significant change in national accounting for decades (Harding 2013), it does not alter the necessary adjustments. As the Ruggles had done, we deduct pension fund earnings (i.e., interest and dividends, -$575.8) and employers' contributions (-$492.4, which now represent increases in pensioners' claims) from current household income. Finally we add to aggregate income the pension benefits paid out by pension funds to retirees for the current year (+$898.3).

The next two areas of adjustment are crucial for the introduction of a capital account for the household sector. First, the payments to and income from the NIPA fictive home-owning firms must be reversed. Since persons living in their own home (owner-occupants) do not earn actual income from their wholly-owned, fictive house/firm, we deduct the 'imputed net rental income' received by owner-occupants (-$367.3). On the other side of the ledger we adjust for the actual costs associated with maintaining a home. To do so, the imputed space rental fees paid to the fictive house/firm are deducted from the owners' outlays (-$1,279.8) and the actual expenses of maintaing the home are added back in (+$620.0).[7] If we were interested only in the actual market transactions of the household sector we would be finished with these two adjustments.[8] However, in spite of their 'market transaction view' title, Ruggles and Ruggles (1992) sought to recover the household sector's annual capital formation and, hence, a capital account.

Introducing a capital account, in turn, requires the addition of non-market adjustments to income and outlays. The capital account includes expenditures on new investments which are offset over time by returns and costs associated with said capital. The current account components, therefore, represent *gross* additions to households' flow of funds – they increase both utility (income) and costs (outlays). As a result, these imputed, or

[6]Household-only income and outlays average, respectively, approximately 99.8% and 99.7% of the total for the combined sector over the two decades of available data.

[7]Expenses include intermediate inputs, taxes, net interest paid less subsides and current transfer payments.

[8]This is the point of departure between the Ruggles' approach and that found in Cynamon and Fazzari (2014) who recover households' (and the economy's) real effective demand from the NIPA.

fictive, figures have no net impact on the level of savings.

The primary issue is how to account for the depreciation or use-value of long-lasting capital goods (e.g. homes and durable goods). For housing we follow Ruggles and Ruggles (1992, p.124) and take the annual depreciation of owner-occupied housing as the difference between imputed space rental and actual expenses (for 2012 this is $\$1,279.8 - \$620.0 = \$659.8$). Although the BEA produces its own estimate for 'imputed housing services' (BEA, Table 7.12 line 164), our measure has the added benefit of having no net impact on household outlays. However, as a gross addition to the household budget, these annual housing service benefits must accrue as a part of household income. This means there is a positive impact on household income, even though the net effect on household savings is nil. Capital account expenditures are discussed below as part of households' capital formation.

Lastly, to complete the current account of the US household sector, we must adjust for the implied services of durable goods. As with the imputed services of owner-occupied housing, durable goods imputations must be added to both income and outlays (+$963.1) – again there is no impact on the level of savings. Durable goods consumption is the only data not available from the BEA directly. Instead we use the Federal Reserve's Flow of Funds series for the consumption of fixed capital by households (no. FA156300103.A). Since we wish to consider aggregate investment spending as separate from the current account, household expenditure on durable goods is deducted from current outlays (-$1,202.7).[9] Such a deduction was not necessary for owner-occupied household purchases because these purchases are attributed to the fictive home/firms in the NIPA.

With these four adjustments (non-profits, pensions, owner-occupied households and durable goods), we have recovered the current account of the household sector. In 2012 household gross income was $14,836.7 billion and *current* outlays were $12,742.6 billion. The difference between these figures yields household gross savings of $2,094.1 billion.

It is out of gross savings that households invest in direct capital formation ($1,552.0). Direct capital formation includes purchases to durable goods (adding back in the $1,202.7 deducted from the current expenses above) and the net purchases of owner-occupied homes (+$349.3). After accounting for these capital purchases, we arrive at household net savings as the difference between gross savings and capital formation – in 2012 household net savings were $542.1 billion. This may be equivalently referred to as households' net lending to ($NS_t > 0$) or borrowing from ($NS_t < 0$) other sectors.

The final two lines of Table 1 report enterprise gross capital formation (GCF, $1,916.7), and the percentage of this accounted for by household Net Savings (28.3%). GCF is, of course, not part of the household current or capital budget, but is a private sector figure against which interesting comparisons can be made. GCF is the relevant figure

[9]Here again is a distinction between our approach and that found in Cynamon and Fazzari (2014). They do not adjust for durable goods since it represents real market transactions. We add these expenditures back in below as part of capital account spending.

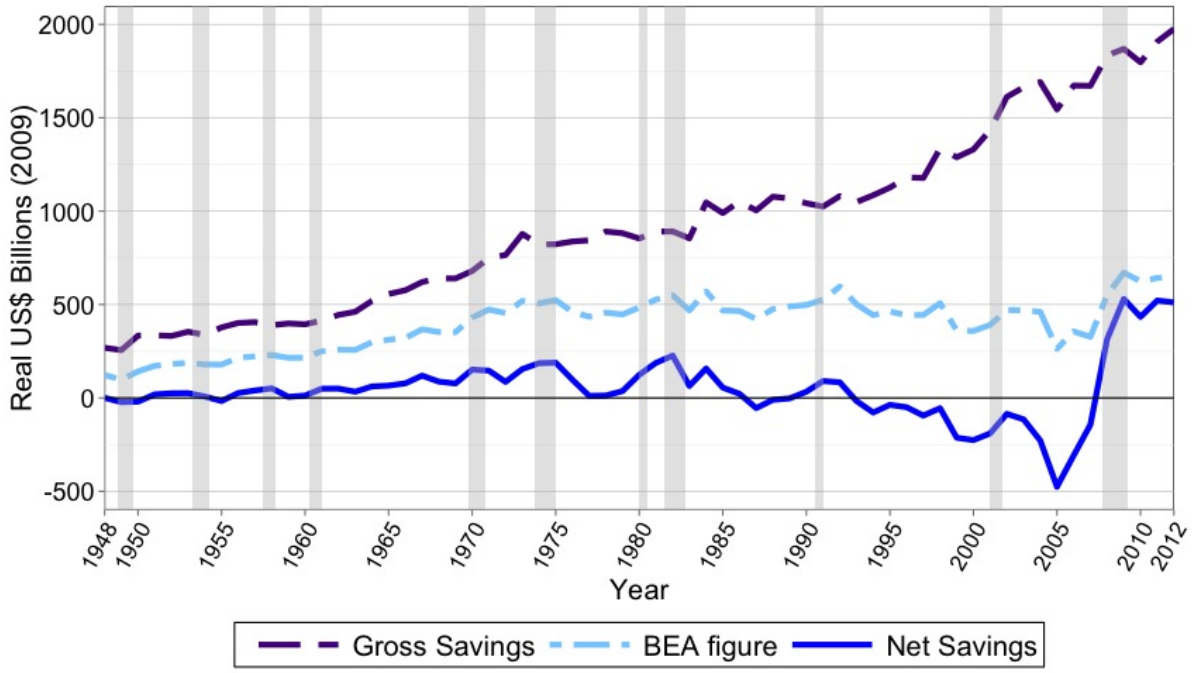
Table 1: Detailed Adjustments to Household Sector Accounts, current US$ billions

Item	Income	Outlay	Savings
US NIPA	**13,743.8**	**13,056.4**	**687.4**
Non-profit institutions	**7.2**	**-74.2**	**81.4**
Employer pension funds	**-169.9**		**-169.9**
Less: Employers' pension contributions	-492.4		
Less: Pension fund earnings	-575.8		
Plus: Pension benefit payments	898.3		
Owner-Occupied Housing	**292.5**	**0.0**	**292.5**
Less: Imputed net rental income	-367.3		
Less: Imputed space rental		-1,279.8	
Plus: Owner-occupied expenses		620.0	
Plus: Imputed housing services (gross)	659.8	659.8	
Household capital formation	**963.1**	**-239.6**	**1,202.7**
Less: Consumer durable outlays		-1,202.7	
Plus: Imputed durable services (gross)	963.1	963.1	
Household gross income, current outlays and gross savings	**14,836.7**	**12,742.6**	**2,094.1**
Household gross capital formation		**1,552.0**	
Purchases of owner-occupied housing		349.3	
Purchases of consumer durables		1,202.7	
Household net lending			**542.1**
Enterprise gross capital formation		**1,916.7**	
Household net lending as percentage of enterprise gross capital formation			28.28%

Precise adjustments available from the author upon request. See Appendix B for further details. All figures are in current (2012) billions US dollars. All data is from the BEA sections 2, 5, 6 and 11 and the Flow of Fund series FA156300103.A.

to test the empirical relevance of households' net lending as a source of loanable funds required for productive, growth-enhancing investment. However, GCF is not immediately available from the BEA. To arrive at the GCF figure we deduct from private enterprises gross capital investment (BEA Table 5.3.5, line 1) the investments made in real estate by fictive household and NPISHs firms (Table 7.12, lines 209 & 210). Note that the Net Savings/GCF fraction reported in Table 1 is rather extreme: it is third highest ratio of net savings in our data series (see Table A.1). Aggregate net lending by households was higher only in 2009 and 2010. The only other years that come close to these ratios are the short-

Figure 2: Three Measures of Household Savings



Author's calculations (see Appendix for details). Shaded regions indicate US recessions truncated to year. All figures are adjusted to billions of 2009 US dollars by the BEA's Personal Consumption Expenditures (PCE) deflator. BEA, Table 1.1.9, line (2).

lived spikes during the oil price shocks (1970-71, 1975) and the 1982 recession/interest rate shock. In stark contrast, from 1993 through 2007 household net saving was persistently negative! That is, through the Clinton-era boom, the dot-com crash and up to the global financial crisis, households were net borrowers (see Figure 2).

The results of the adjustments highlighted for 2012 in Table 1 are presented for the years 1990-2012 in Table 2. These figures are adjusted to 2009 US dollars. The full data series starting in 1948 is in Appendix A (Table A.1) and plotted in Figure 2. The table and plots show that net savings have been volatile and counter-cyclical over the entire period for which data are available. Figure 2 also shows that households' gross savings have trended significantly upward over the past 30 years. Yet, Net Saving was, from the 1980s double-dip recession through to the housing market collapse in 2007/08, stagnant or falling. The widening gap between these two series signals an enormous increase in household capital purchases which were, in aggregate for the entire sector, financed by external investment. Plodding along through the middle of these two series is the BEA's figure for total household savings – though it stagnates and declines somewhat through the late 1990s/early 2000s, it captures none of the unprecedented changes that were occurring during this era of massive increases in household indebtedness.

Table 2: Household Net Savings and Enterprise Capital Formation, Selected Years

Year	Household Sector			Enterprise Sector Gross Capital Formation	Household net Lending (+) or Net Borrowing (-) as % of Enterprise Gross Capital Formation
	Gross Household Savings	Household Gross Capital Formation	Household Net Lending (+) or Net Borrowing (-)		
1990	1,042.11	1,009.19	32.92	949.67	2.95
1991	1,024.40	934.10	90.30	900.32	8.66
1992	1,080.33	996.78	83.54	924.39	8.01
1993	1,048.59	1,065.37	-16.78	993.88	-1.52
1994	1,085.07	1,163.24	-78.16	1,066.47	-6.61
1995	1,126.03	1,163.20	-37.16	1,169.16	-2.88
1996	1,180.68	1,230.44	-49.76	1,264.65	-3.64
1997	1,177.57	1,272.41	-94.84	1,380.22	-6.45
1998	1,334.93	1,389.97	-55.04	1,502.74	-3.49
1999	1,288.53	1,501.66	-213.14	1,637.13	-12.54
2000	1,330.07	1,556.12	-226.05	1,762.43	-12.48
2001	1,433.38	1,623.27	-189.90	1,665.24	-11.20
2002	1,611.69	1,697.22	-85.52	1,537.00	-5.52
2003	1,663.09	1,777.89	-114.80	1,550.55	-7.39
2004	1,690.86	1,919.06	-228.21	1,604.31	-14.09
2005	1,544.48	2,020.49	-476.00	1,702.04	-27.30
2006	1,672.26	1,980.15	-307.89	1,792.91	-16.57
2007	1,670.98	1,814.52	-143.54	1,880.39	-7.41
2008	1,833.97	1,519.79	314.18	1,865.15	16.69
2009	1,868.52	1,339.10	529.42	1,562.80	33.88
2010	1,796.90	1,363.01	433.89	1,604.15	27.72
2011	1,907.52	1,386.20	521.31	1,734.75	31.12
2012	1,975.39	1,464.01	511.38	1,881.89	28.28
Total (1948-2012)	**60,736.13**	**57,925.14**	**2,810.99**	**53,773.91**	**5.23%**

Author's calculations. All figures in billions of 2009 US dollars, except for the percentages in column 6. See Appendix A, Table A.1 for full series.

3 Implications for Theory

In recovering households' gross savings from the BEA's national accounts we have derived two exhaustive components of the gross measure: capital formation and net savings. These twin concepts have largely been ignored in micro- and macro-economic theory, yet they offer broad insights into household budgeting and loanable funds theory. On the one hand, the life-cycle pattern of household budgeting is more accurately described by taking account of capital account investments (rather than simply savings or dissavings). On the other hand, the net savings that remain after the household sector makes its internal investments are, by definition, the only funds made available to other sectors. Before elaborating these points it is important to note that the behavioural implications of the macroeconomic data can offer only cursory insights into the actions of heterogeneous households. The macro-level loanable funds implications, however, do offer testable hypotheses. To that end, Section 4 tests the correlation and explanatory strength of net savings vis-à-vis private sector investment and growth.

3.1 Household Budgeting

As Ruggles and Ruggles (1992) note, the business cycle pattern of the sector-level results are in direct opposition to the permanent income hypothesis (PIH) proposed by Friedman (1957) and subsequently incorporated into real business cycle (RBC) models (e.g., Prescott 2004). The core empirical claim of the PIH is procyclical savings as individuals smooth their life-time consumption level. Household savings, therefore, act as a buffer: taking in extra income during good times and being drained during downturns. In contrast, our data, as well as the original results of the Ruggles & Ruggles, display counter-cyclicality. Indeed, as Figures 1 and 2 respectively show, both the net savings *rate* and *level* follow a countercyclical pattern, rising as a recession takes hold and falling as the economy recovers.

Though the letter of the PIH is rejected by the corrected national accounts data, its spirit of consumption smoothing remains in tact. Net savings are more volatile than gross savings. Therefore, as one would expect, the ratio of household capital formation to net saving is procyclical. Conversely, in a downturn households hold back on big-ticket items and instead 'consume' more of their extant fixed capital. The effect is consumption smoothing in the sense that older items (ovens, furniture, automobiles, etc) are maintained until the household's income recovers, at which point new investments can be made without sacrificing current consumption. In our accounting, however, the pattern manifests as increased net savings (fewer capital purchases) followed by falling or dissavings rates.

The capital account consumption smoothing process just described also challenges the life-cycle income hypothesis (LCH). The LCH views savings behaviour as an arc over the course of one's life. It suggests that people save a significant portion of their income while

young so that they may draw down on their accumulated assets later in life. On the whole the LCH predicts that younger individuals are net lenders while older generations dissave (i.e., act as net borrowers). However, once households are understood as investors in themselves rather than as passive savers the life-cycle arc is turned on its head. Ruggles and Ruggles (1992, p. 125) neatly summarize this point:

> Although there is a life-cycle pattern, it is not the one suggested by the life cycle hypothesis. It is not the accumulation of saving for old age that drives the system. Rather the dominant pattern relates to the acquisition of housing and durables by households in their formative years; in their middle and later years they repay mortgages and consumer debt thus increasing their saving and accumulating equity.

This description is even more accurate toady as younger generations take on enormous student debt loads that will be paid back (one hopes) later in life. Thus, under the capital formation view of household aggregate behaviour, it is both the young and the elderly who dissave, while it is prime age workers who supply the positive balance of funds.

The life cycle pattern suggested by the Ruggles led them to predict increasing net savings in the coming years as the US population aged. Yet, as we have seen, the 1990s and 2000s were beset by the unprecedented persistence of negative net savings (when baby boomers were in their prime earning years!). This suggests a serious behavioral change has taken place in the two decades since the Ruggles published their paper. Interestingly, these years of dissaving occurred during the booming years under Presidents Bill Clinton and, to a lesser extent, George W. Bush. For standard macroeconomic theory this is a very counter-intuitive pattern since business investments were at all time highs through these years. Under a supply-of-funding constrained system, the level of private sector capital formation should have been limited by the lack of funds made available by households. We next consider why this was evidently not the case.

3.2 The Savings-Investment Nexus

Mainstream modern macroeconomics invariably treats savings as the driving force linking the present to the future. The level and rate of investment may vary year to year, but it must eventually be contained by the economy's real pool of savings. This (often implicit) economic view ignores the demand driven, or endogenous, nature of money and credit (Minsky 1973; Moore 1988) and rules out models with insightful nonlinear dynamics (for early examples see Kalecki 1939; Kaldor 1940). Furthermore, mainstream models more often than not treat households as the repository of all savings and firms as the sole entities engaged in capital formation. Given the adjusted accounting data discussed above, such models place enormous stock in Net Savings as the economy's driving force.

The accounting identity that national savings equals national investment *ex post* provides no insight into how *ex ante* inequality, $S \neq I$, adjusts to reach $S = I$. Yet all standard RBC and New Keynesian models smooth over this distinction by setting $S = I$ as part of the analytical set up. Since S is a *de facto* choice variable in DSGE models, it

is necessarily I which adjusts to the agent(s) chosen S in each period. In loanable funds terms, the demand (I) adjusts to meet the supply (S) which is in turn generated by the identity $S = Y - C$. Moreover, with only one sector or agent, there is an inescapable one-to-one relationship running from savings to investment. Clearly, such representative agent models cannot account for the persistent negative saving levels evidenced by US households during the 1990s and 2000s.

Recently more sophisticated financial accelerator models have worked within the DSGE framework to better capture the volatility of investment patterns (Kiyotaki and Moore 1997; Bernanke et al. 1999; He and Krishnamurthy 2008). In this strand of literature households and "experts" consume out of net worth, which fluctuates with past investment and present shocks. This is somewhat closer to the notion, advocated above, that households smooth consumption through the services of their own fixed capital. The portfolio approach utilized in these models represents an improvement as investment decisions – usually the allocation of funds between a risky and risk-free asset – are brought to the fore. However, the models remain inescapably savings constrained. Even in the most complex model of macro-financial linkages, investible funds remain defined as the amount of capital remaining after consumption (e.g., Brunnermeier and Sannikov 2014, equations 7 & 8).[10]

Given the persistent patterns of gross and net savings it would seem that the ubiquitous acceptance that $S = I$, where S is household savings and I is private investment requires reconsideration. Clearly, the incorporation of other sectors into macroeconomic models is desirable. Yet, the data presented in Section 2 calls into question the existence of any meaningful relationship between household savings and private investment. If true, such a finding would require macroeconomic theory to always consider, at a minimum, two sectors. In the next section we explore the empirical relationship between the net savings/lending of households, firms' annual investment and GDP. We find that the three series are closely correlated, but that Net Savings is an exogenous variable containing no impactful relationship with the other two series.

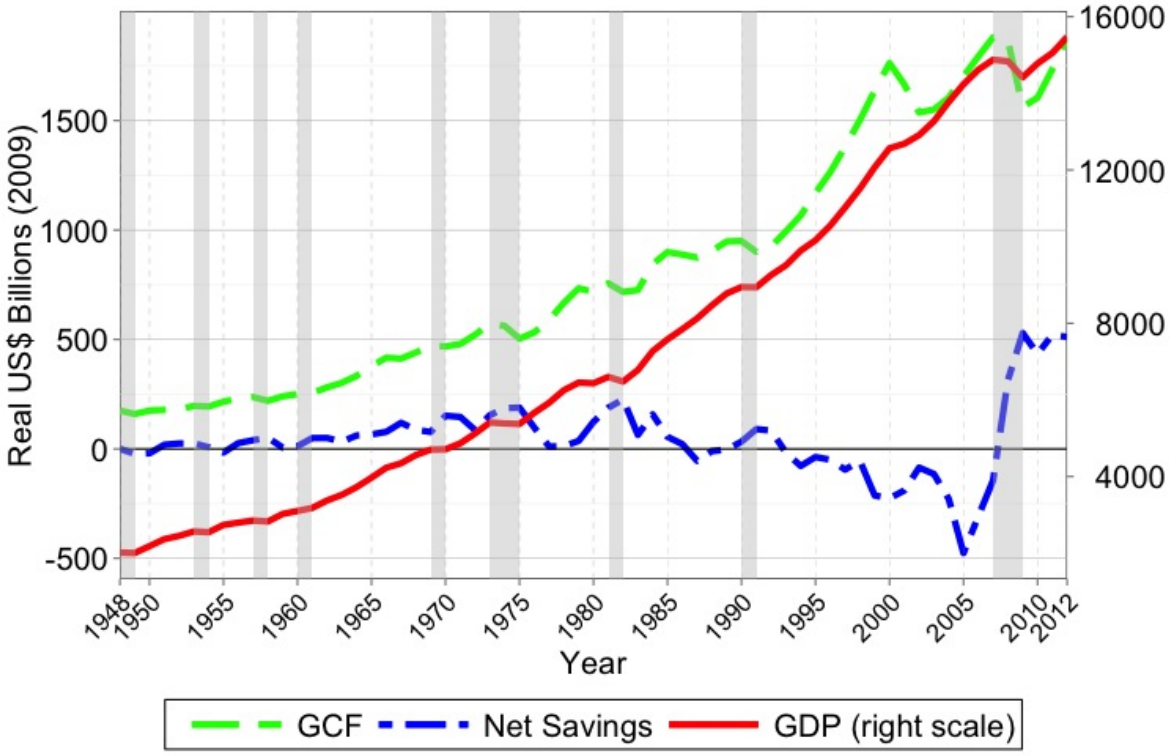
4 Testing Net Savings as part of Macroeconomic Activity

To investigate the relationships between household net savings, private enterprises' gross capital formation (GFC) and US gross domestic product (GDP) from 1948 through 2012 we estimate and test a vector error correction model (VECM). The three inflation-adjusted series are plotted in Figure 3. The VECM is necessary since each data series is I(1) and form a cointegrated system of order 2. To save space the pretesting results are not presented here. However, I(1) series were found for a variety of specifications including

[10]In effect, financial accelerator-type models replace $S = Y - C$ with $I = NW - C$ where NW is net worth. But $S = I$ is sill never-violated relationship. The only substantive difference is that the growth process is now a market returns question (dNW) rather than a production problem ($Y = F(K, L)$).

the Augmented Dickey-Fuller and KPSS tests, as well as the Zivot-Andrews test which accounts for structural breaks. Similarly, a cointegration rank order of 2 is found under Johansen tests with and without an *ad hoc* dummy variable for the financial crisis, as well as under the Lütkepohl test that endogenously determines the point of a shift in levels (see Johansen 1988; Lütkepohl et al. 2004; Hamilton 1994, Chapter 20). Part 4.1 estimates the VECM model. Part 4.2 tests for the exogeneity of each of three series. We find that, in spite of the strong evidence of cointegration, net savings are decidedly exogenous to the series. The finding that suggests households' supply of loanable funds to the private sector is of little or no importance to macroeconomic performance.

Figure 3: Time Series Levels, annual data



Author's calculations. GDP data from BEA Table 1.1.5. Adjustments to 2009 US dollars made by annual figures of BEA Table 1.1.9, *Implicit Price Deflators for Gross Domestic Product* lines (1), (7) and (2) for GDP, GCF and Net Savings, respectively.

4.1 Estimating the VECM

The cointegrated model estimates of GDP, GCF and Net Savings are performed for the standard Johansen trace test and a Johansen trace procedure in which a level shift dummy variable is included. The first choice is a matter of preference since the two Johansen procedures produce the same parametric estimates and standard errors, and are therefore

redundant. The latter specification is chosen to ease the analysis, since estimation of a model with an unknown level shift leads to unnecessary complications (see Lütkepohl 2010, sec., 17.4).[11] The new approach explicitly incorporate the level shift predicted by the Lütkepohl method for the unknown shift point. That is,

$$\mathbf{D}_t = \begin{cases} 0 & \text{for } t < \tau \\ 1 & \text{for } t \geq \tau \end{cases} \tag{1}$$

where $\tau = 2008$ as confirmed both by the narrative surrounding the financial crisis and the Lütkepohl test for cointegration with a level shift.

For both VECM formulations, define

$$\mathbf{y}_t' := \begin{pmatrix} GDP_t & GFC_t & NS_t \end{pmatrix} \tag{2}$$

and

$$\boldsymbol{\Delta}\mathbf{y}_t' := \begin{pmatrix} \Delta GDP_t & \Delta GFC_t & \Delta NS_t \end{pmatrix} \tag{3}$$

where NS_t represents Net Savings of the household sector.

Then, following the notation of Lütkepohl (2010), the VAR(2) process has a VECM representation

$$\boldsymbol{\Delta}\mathbf{y}_t = \boldsymbol{\alpha}\boldsymbol{\beta}^{0'} \cdot \begin{bmatrix} \mathbf{y}_{t-1} \\ t \end{bmatrix} + \boldsymbol{\Gamma}_1 \cdot \boldsymbol{\Delta}\mathbf{y}_{t-1} + \boldsymbol{\nu} + \mathbf{u}_t \tag{4}$$

This may be equivalently expressed as

$$\boldsymbol{\Delta}\mathbf{y}_t = \boldsymbol{\alpha} \cdot \mathbf{z}_{t-1} + \boldsymbol{\Phi} t + \boldsymbol{\Gamma}_1 \cdot \boldsymbol{\Delta}\mathbf{y}_{t-1} + \boldsymbol{\nu} + \mathbf{u}_t \tag{5}$$

where

$$\boldsymbol{\beta}^{0'} := [\boldsymbol{\beta}' : \boldsymbol{\eta}], \quad \boldsymbol{\Phi} := \boldsymbol{\alpha} \cdot \boldsymbol{\eta} \quad \text{and} \quad \boldsymbol{\beta}' \cdot \mathbf{y}_{t-1} := \mathbf{z}_{t-1}$$

The $r \times (k+1)$ matrix $\boldsymbol{\beta}^{0'}$ represents the cointegrating relations which includes the deterministic trend component, t. The vector $\mathbf{z}_t$ contains the error corrected lagged level variables for which the $k \times r$ 'loading matrix', $\boldsymbol{\alpha}$, is estimated. $\boldsymbol{\nu}$ is the unrestricted constant term and $\mathbf{u}_t$ is a vector of independent Gaussian errors.

The least squares estimation of the coefficients from equation (4) are reported in Table 3. The results show a significant negative relationship between the lagged change in Net Savings (ΔNS_{t-1}) and the changes in ΔGDP_t and ΔGFC_t. Specifically, a \$1 change

[11] Unnecessary given the ubiquitous acknowledgement of the long-term impact of the global financial crisis.

Table 3: VECM Estimation Coefficients, constant and deterministic trend

	Error Correction		**Constant**	**Lagged Differences**			**Fit**
	$\alpha_{i,1}$	$\alpha_{i,2}$	$\boldsymbol{\nu}$	ΔGDP_{t-1}	ΔGCF_{t-1}	ΔNS_{t-1}	R^2_{adj}
ΔGDP_t	0.045	-0.231	49.464	0.285	-0.739	-0.874^{***}	0.761
	(1.17)	(-0.96)	(0.90)	(1.28)	(-1.59)	(-3.97)	[0.00]
ΔGCF_t	0.061^{***}	-0.376^{***}	-55.602^{***}	0.059	0.238	-0.317^{***}	0.536
	(4.26)	(-4.21)	(-2.74)	(0.72)	(1.39)	(-3.90)	[0.00]
ΔNS_t	-0.011	0.097	8.740	-0.252^{*}	0.690^{**}	0.192	0.109
	(-0.44)	(0.60)	(0.24)	(-1.69)	(2.21)	(1.31)	[0.05]

Author's calculations. Coefficient t-statistics are reported in round parentheses. The final column reports the adjusted R^2 measure of fit and, in square brackets, the p-value associated with the F-test of the regression. In each regression the degrees of freedom are 6 over 57. Significance levels *, **, *** indicate rejection of the null hypothesis with 10%, 5% and 1% confidence, respectively.

in Net Savings precedes an \$0.87 drop in GDP and a \$0.32 decline in private capital formation. This aligns with the counter-cyclical behaviour of Net Savings discussed in section 2. Yet, it is notable that changes in Net Savings appears as the only significant lagged differenced variable for changes in the other two series. Conversely, both ΔGDP_{t-1} and ΔGCF_{t-1} are significant with respect to changes in Net Savings, though GDP has a negative impact (with a \$1 increase in output leading to a 25¢ fall in savings), whereas increasing rates of investment precede increasing rates of household net savings. Finally, Table 3 has the interesting result that only ΔGCF_t is significantly affected (and, at the 1% level in each case) by the error correction matrix on lagged levels, $\boldsymbol{\alpha}$, as well the constant term $\boldsymbol{\nu}$.

The results in Table 3 are not riveting. The lack of significant coefficients in the ΔGDP and ΔNS regressions undermines the strength of the cointegrated relationship found in pretesting. That said, this specification for ΔGDP has a remarkably high explanatory power with $R^2_{adj} = 76\%$, even though there is but one significant regressor. Conversely, ΔGCF is significantly explained by the error correction term, yet it has a lower R^2_{adj} at 54%. Finally, only 11% of the changes in Net Savings are explained by this model (though it retains explanatory power with a p-value = 5%).

The level shift VEC model requires a slight modification. Rather than testing (4), we include the explicit trend shift term $\mathbf{D}_t$ as defined in equation 1.

$$\boldsymbol{\Delta}\mathbf{y}_t = \boldsymbol{\alpha}\boldsymbol{\beta}^{0'} \cdot \begin{bmatrix} \mathbf{y}_{t-1} \\ t \end{bmatrix} + \boldsymbol{\Gamma}_1 \cdot \boldsymbol{\Delta}\mathbf{y}_{t-1} + \boldsymbol{\nu} + \mathbf{D}_t + \mathbf{u}_t \tag{4'}$$

The results of the level shift model specified by (4′) are presented in Table 4.

The VECM estimation which includes a level shift dummy, $\mathbf{D}_t$, performs much better

than the standard approach discussed above. The majority of the coefficients are now significant (see Table 4), and all signs remain unchanged from Table 3. Changes in GDP now depend significantly on lagged changes in net savings and private capital formation. Moreover the estimated coefficients of each have increased in magnitude such that ΔNS_{t-1} now has a one-to-one negative relationship with ΔGDP_t. Further, ΔGDP's own lagged difference is now significant at the 10% level. ΔGCF is little changed from the previous VECM estimation, which is logical given it is the only series for which the financial crisis's level shift is not significant. Nevertheless, the inclusion of the dummy now means that ΔGDP_{t-1} is now significantly and positively related to changes in capital formation, as expected. Finally, the lagged differences of the other two variables are now insignificance with respect to ΔNS where as the constant and dummy variables are highly significant. It is also notable that the error correction matrix $\boldsymbol{\alpha}$ now has at least one significant element in each equation of the level shift VECM.

Table 4: Level Shift VECM Estimation Coefficients, deterministic trend

	Error Correction		**Constants**		**Lagged Differences**			**Fit**
	$\alpha_{i,1}$	$\alpha_{i,2}$	$\boldsymbol{\nu}$	$\mathbf{D}_t$	ΔGDP_{t-1}	ΔGCF_{t-1}	ΔNS_{t-1}	R^2_{adj}
ΔGDP_t	0.015	0.344*	40.5	−307.1**	0.388*	−0.867**	−1.039***	0.773
	(0.45)	(1.82)	(0.77)	(-2.21)	(1.96)	(-2.03)	(-4.28)	[0.00]
ΔGCF_t	0.041***	−0.139*	−39.8*	-58.0	0.131*	0.110	−0.373***	0.496
	(3.10)	(-1.86)	(-1.92)	(-1.06)	(1.67)	(0.65)	(-3.90)	[0.00]
ΔNS_t	−0.091***	0.081	145.8***	545.2***	-0.056	0.168	0.256**	0.585
	(-5.80)	(0.92)	(5.92)	(8.39)	(-0.61)	(0.84)	(2.26)	[0.00]

Author's calculations. Coefficient t-statistics are reported in round parentheses. The final column reports the adjusted R^2 measure of fit and, in square brackets, the p-value associated with the F-test of the regression. In each regression the degrees of freedom are 7 over 56. Significance levels *, **, *** indicate rejection of the null hypothesis with 10%, 5% and 1% confidence, respectively.

The final column Table 4 evidences the importance of the financial crisis's structural break for these time series. Although, R^2_{adj} has declined slightly to 50% for ΔGCF and risen a mere 1 percentage point for ΔGDP, the fit to the Net Savings series has jumped from 10.9% to 58.5%. This has, of course, come along with a rise in significance of the ΔNS equation to the 0.1% level.

The results presented in Tables 3 and 4 demonstrate that the data generating process is better captured by (4′) than by equation (4). Not only does the fit of the series – particularly ΔNS – increase, but the significance of coefficients are improved in nearly every case. This finding accords with the structural break tests performed in in pretesting and with the history of the recent global financial crisis. It would appear that the dynamics of output, private investment and household savings are closely, and inevitably, entwined. Given the low level of households' Net Savings vis-à-vis enterprise capital formation

discussed in section 2, the strong relationship somewhat surprising. Yet, this would be forgetting that we are testing the transient relationships between these variables. Therefore, while there can only be a small long-term aggregative impact of Net Savings on GCF, they clearly covary with each other and with GDP. We now turn our final test for weak exogeneity of each of the series.

4.2 Causality Analysis

As a final check on the interrelationships between GDP, gross capital formation by private enterprise and household's Net Savings we employ a causality test specific to cointegrated systems known as weak exogeneity. The methodology of the test is to impose additional cointegrating restrictions on the loading matrix, $\boldsymbol{\alpha}$ in equations (4) and (4′), and to check whether the new restriction holds. For exogeneity testing this amounts to imposing a zero weight on one variable and equal weighting on all others. If the zero weighting restriction can be rejected then that variable is not exogenous to the system (Pfaff 2008, sec. 8.1), implying a causal relationship of that variable to the cointegrated system. The weak exogeneity test is employed for each possibility of our 3-dimensional system with two cointegrating relationships by imposing a zero weight to 'drop' each variable in turn.

Table 5: Weak Exogeneity Tests of the VEC Models

Dropped Variable	**Standard VECM**		**Level Shift VECM**	
	$\chi^2(2)$	p-val	$\chi^2(2)$	p-val
Net Savings	3.58	0.17	4.00	0.14
GCF	5.25	0.07	13.56	0.00
GDP	12.49	0.00	18.75	0.00

Author's calculations. The test statistic has a $\chi^2(r \cdot (K-m)$ distribution, where m is the number of restrictions imposed. Hence there are 2 degrees of freedom in each test.

The results of the the exogeneity test are reported in Table 5. The clear implication of this test is that Net Savings is an exogenous variable. In both the standard VEC model and the level shift extension, the null hypothesis of a zero weighting on Net Savings cannot be rejected at any standard confidence level. In other words, the system can be reduced to an m-dimensional system, where $m = 2$ for the two equal weights imposed on GDP and GCF. By contrast, the VECM restrictions that drop GDP are rejected at the 1% level for both models, while the GCF-dropping restrictions can be dropped at the 10% level for the standard model and at the 1% level for the level shift model. We therefore conclude our that GDP, GCF and Net Savings form a tight cointegrated system, but that Net Savings is not an endogenous, irremovable element. In other words, Net Savings has a correlative relationship with growth and business investment, but not an essential, and much less a causal, impact on microeconomic performance.

5 Conclusion

Updating the NIPA adjustments for households' actual transactions behavior, first conducted by Ruggles and Ruggles (1992), showed that their findings of highly variable, counter-cyclical and, on average, small levels of household Net Savings continue to hold through to the present. In section 3 we argued that these data demanded a reconsideration of the permanent income and life-cycle hypotheses of consumer behaviour. Specifically, the capital account of households is a more appropriate concept for understanding people's pattern of consumption and savings over their life times. Secondly, our data challenges the ubiquitous assumption of a savings-constrained economy. Section 4 provided extensive testing of the relationship between households' lending to other sectors, private investment and GDP only to find that only investment and economic activity are inexorably bound. The finding of household net savings as weakly exogenous strongly suggests that household lending is a passive exercise – rather it is current consumption and capital account expenditures over which households have control. Very few actively balance a portfolio between risky and non-risky assets. Rather households prefer to invest in consumable capital such as housing and durable goods.

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Appendix A Household Savings and Enterprise Investment

Table A.1: Household Savings Adjustments Relative to Enterprise Capital Formation, 2009 $US billions

	Household Sector			Enterprise Sector Gross Capital Formation	Household Net Lending / Borrowing (+/-) as % of Enterprise Gross Capital Formation
Year	Gross Household Savings	Household Gross Capital Formation	Household Net Lending / Borrowing (+/-)		
1948	268.28	267.76	0.52	174.99	0.24
1949	255.71	278.45	-22.75	159.35	-11.23
1950	333.32	353.61	-20.29	175.11	-9.02
1951	334.79	315.89	18.90	178.17	8.13
1952	331.62	306.94	24.67	178.98	10.53
1953	354.13	328.64	25.49	196.56	9.95
1954	337.50	330.16	7.34	193.66	2.91
1955	377.39	394.05	-16.66	215.35	-5.87
1956	401.28	375.08	26.20	230.49	8.32
1957	405.41	365.82	39.59	236.84	12.18
1958	389.05	338.04	51.02	219.31	17.29
1959	398.62	392.82	5.80	240.05	1.80
1960	394.20	381.77	12.43	250.21	3.75
1961	413.70	364.35	49.35	255.92	14.73
1962	444.37	394.65	49.72	280.98	13.66
1963	461.13	428.10	33.03	301.98	8.56
1964	519.25	457.90	61.34	333.76	14.50
1965	556.33	490.36	65.97	378.16	13.74
1966	576.28	498.43	77.85	416.60	14.78
1967	620.24	501.02	119.22	412.55	22.82
1968	640.23	552.94	87.29	440.28	15.63
1969	639.42	562.12	77.30	471.28	12.88
1970	679.51	527.99	151.52	468.24	25.50
1971	749.29	603.35	145.94	478.83	23.83
1972	764.99	679.27	85.72	521.43	12.75
1973	877.84	723.69	154.15	572.34	20.86
1974	821.81	635.84	185.96	561.67	25.76
1975	822.47	633.94	188.53	503.34	28.16
1976	837.56	740.39	97.17	532.21	13.69
1977	843.55	832.50	11.05	588.64	1.39
1978	890.89	878.29	12.60	667.40	1.38

Year	Household Sector			Enterprise Sector Gross Capital Formation	Household Net Lending / Borrowing (+/-) as % of Enterprise Gross Capital Formation
	Gross Household Savings	Household Gross Capital Formation	Household Net Lending / Borrowing (+/-)		
1979	881.85	845.38	36.47	733.65	3.64
1980	853.57	729.88	123.69	717.32	12.78
1981	890.77	702.98	187.79	756.36	18.35
1982	891.22	664.89	226.34	717.06	23.31
1983	854.41	790.44	63.97	725.41	6.77
1984	1,046.62	889.25	157.37	843.64	14.71
1985	989.76	934.70	55.07	899.29	4.93
1986	1,051.76	1,030.06	21.71	887.83	1.96
1987	1,003.63	1,058.17	-54.55	874.44	-5.06
1988	1,077.63	1,087.95	-10.32	904.28	-0.93
1989	1,067.38	1,070.08	-2.70	947.67	-0.24
1990	1,042.11	1,009.19	32.92	949.67	2.95
1991	1,024.40	934.10	90.30	900.32	8.66
1992	1,080.33	996.78	83.54	924.39	8.01
1993	1,048.59	1,065.37	-16.78	993.88	-1.52
1994	1,085.07	1,163.24	-78.16	1,066.47	-6.61
1995	1,126.03	1,163.20	-37.16	1,169.16	-2.88
1996	1,180.68	1,230.44	-49.76	1,264.65	-3.64
1997	1,177.57	1,272.41	-94.84	1,380.22	-6.45
1998	1,334.93	1,389.97	-55.04	1,502.74	-3.49
1999	1,288.53	1,501.66	-213.14	1,637.13	-12.54
2000	1,330.07	1,556.12	-226.05	1,762.43	-12.48
2001	1,433.38	1,623.27	-189.90	1,665.24	-11.20
2002	1,611.69	1,697.22	-85.52	1,537.00	-5.52
2003	1,663.09	1,777.89	-114.80	1,550.55	-7.39
2004	1,690.86	1,919.06	-228.21	1,604.31	-14.09
2005	1,544.48	2,020.49	-476.00	1,702.04	-27.30
2006	1,672.26	1,980.15	-307.89	1,792.91	-16.57
2007	1,670.98	1,814.52	-143.54	1,880.39	-7.41
2008	1,833.97	1,519.79	314.18	1,865.15	16.69
2009	1,868.52	1,339.10	529.42	1,562.80	33.88
2010	1,796.90	1,363.01	433.89	1,604.15	27.72
2011	1,907.52	1,386.20	521.31	1,734.75	31.12
2012	1,975.39	1,464.01	511.38	1,881.89	28.28
Total	**60,736.13**	**57,925.14**	**2,810.99**	**53,773.91**	**5.23%**

Appendix B Detailed Recreation of Ruggles and Ruggles' Adjustments

Documented Recreation of Ruggles & Ruggles' Adjustments in Table 1

		Income	Outlay	Savings	Source and Notes
1	**NIPA, US personal income and and outlays accounts**	**4,384.3**	**4,212.5**	**171.8**	*SCB*, Account 2. Personal Income
	1b: Taxes		658.8		*SCB*, Account 2. Personal Taxes
	1c: Outlays		3,553.7		*SCB*, Account 2. Personal Outlays
2	**Non-Profit Institutions**	**-53.7**	**-53.7**	**0.0**	
3	Less: Investment & imputed rental income	-43.2			T.B.D.; in *SCB*, Table 8.9, lines (99) corresponds to one element in original (=$26.8)
4	Less: Business and Government Transfers	-10.5			T.B.D.; likely in *SCB*.
5	Plus: Owner-occupied expenses		-168.4		Derived: [2]-[6]. Ruggles and Ruggles derived this for wont of actual data. They assume NPISHs have zero savings.
6	Plus: Household contributions to non-profits		114.7		*Statistical Abstract of the United States*, table No. 627, line (1): Total Funds
7	**Owner-Occupied Housing**	**89.2**	**0.0**	**89.2**	
8	Less: Imputed net rental income	23.4			*SCB*, Table 8.9, lines (91) + (98)
	8a: non-farm, owner-occupied housing	-27.4			(91) rental income of persons with CCadj

Documented Recreation of Ruggles & Ruggles' Adjustments in Table 1

		Income	Outlay	Savings	Source and Notes
	8b: farm, owner-occupied housing	4.0			(98) Proprietors' income with IVA & CCadj
9	Less: imputed space rental		-371.1		*SCB*, Table 8.9, lines (84) + (92)
	9a: non-farm, owner-occupied housing		361.7		(84) Space rent
	9b: farm, owner-occupied housing		9.4		(92) Space rent
10	Plus: Owner-occupied expenses		356.0		*SCB*, Table 8.9, lines (85) + (88) - (89) + (90) + (93) + (96) + (97)
	10a: non-farm, owner-occupied housing		45.5		(85) intermediate goods & services consumed
	10b: non-farm, owner-occupied housing		61.1		(88) indirect business tax and non-tax liability
	10c: non-farm, owner-occupied housing		0.1		(89) subsidies
	10d: non-farm, owner-occupied housing		196.5		(90) net interest
	10e: farm, owner-occupied housing		1.7		(93) intermediate goods & services consumed
	10f: farm, owner-occupied housing		0.3		(96) indirect business tax and non-tax liability
	10g: farm, owner-occupied housing		0.6		(97) net interest
11	Plus: imputed housing services (gross)	71.3	71.3		Derived: [9]+[10]
12	**Employer pension funds**	**-56.1**		**-56.1**	
13	Less Employers' pension contributions	-58.6			*SCB*, Table 6.13, lines (21) + (24)
	13a: private pension & welfare funds	47,768			(21) Pension and profit-sharing [millions]
	13b: private pension & welfare funds	10,794			(24) group life insurance [millions]

Documented Recreation of Ruggles & Ruggles' Adjustments in Table 1

		Income	Outlay	Savings	Source and Notes
14	Less: pension fund earnings	-161.9			Table 8.8, line (50): Imputed rent to persons
15	Plus: Pension benefit payments	164.4			Table 6.13, lines (29) + (31)
	15a: private pension & welfare funds	154,328			(29) Pension and profit-sharing [millions]
	15b: private pension & welfare funds	10,142			(31) group life insurance [millions]
16	**Household capital formation**	**340.7**	**-133.9**	**474.6**	
17	Less: Consumer durable outlays		-474.6		*SCB*, Table 2.2, line (2): Personal Consumption Expenditure (=–[22])
18	Plus: imputed durable services (gross)	340.7	340.7		FoF, 'Income & Product Distribution', line (73)
19	**Household gross income, current outlays and gross savings**	**4,704.4**	**4,024.9**	**679.5**	Derived: [1] + [2] + [8] + [12] + [16]
20	**Household gross capital formation**		**662.6**		
21	Purchases of owner-occupied housing		188.0		*SCB*, Table 8.9, lines (118) + (119)
	21a: other		184.0		(118) net purchases of owner-occupied homes
	21b: other		4.0		(119) margins on owner-built homes

Documented Recreation of Ruggles & Ruggles' Adjustments in Table 1

		Income	Outlay	Savings	Source and Notes
22	Purchases of consumer durables		507.0		*SCB*, Table 2.2, line (2): Personal Consumption Expenditure (=–[17])
23	**Household net lending**			**16.9**	Derived: [19, Savings] - [20]
24	**Enterprise gross capital formation**		**583.2**		*SCB*, Table 5.12, line (1) – (Table 8.9, lines (118) + (120))
	24a: Fixed Investment		742.9		Table 5.12, line (1): Total Fixed Investment
	24b: other		–184.0		Table 8.9, line (118): net purchases of owner-occupied homes
	24c: other		–20.7		Table 8.9, line (120): net purchases of buildings and equipment owned and used by NPISHs
25	**Household net lending as a percentage of enterprise gross capital formation**			2.9%	Derived: [23] ÷ [24]

Sources:

Bureau of Economic Analysis, *Survey of Current Business (SCB)*, Vol. 70, No. 7, July 1991.
Federal Reserve, *Flow of Funds Accounts, Second Quarter, 1991.* Z1
Bureau of Economic Analysis, *Statistical Abstract of the U.S. 1991.* Z1

Note:

The row numbers correspond to the rows in Ruggles and Ruggles Table 1.
Row numbers in parentheses "( )" indicate rows in source material.
Square brackets "[ ]" refer to rows of the present table.