

Mason, J. W.

Working Paper

Income distribution, household debt, and aggregate demand: A critical assessment

Working Paper, No. 901

Provided in Cooperation with:

Levy Economics Institute of Bard College

Suggested Citation: Mason, J. W. (2018) : Income distribution, household debt, and aggregate demand: A critical assessment, Working Paper, No. 901, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY

This Version is available at:

<https://hdl.handle.net/10419/209144>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Working Paper No. 901

Income Distribution, Household Debt, and Aggregate Demand: A Critical Assessment

J. W. Mason*

Department of Economics, John Jay College-CUNY
and The Roosevelt Institute

March 2018

* I thank David Alpert, Heather Boushey, Barry Cynamon, Sandy Darity, Steve Fazzari, Arjun Jayadev, Matthew Klein, and Suresh Naidu for helpful comments on earlier versions of this paper.

The Levy Economics Institute Working Paper Collection presents research in progress by Levy Institute scholars and conference participants. The purpose of the series is to disseminate ideas to and elicit comments from academics and professionals.

Levy Economics Institute of Bard College, founded in 1986, is a nonprofit, nonpartisan, independently funded research organization devoted to public service. Through scholarship and economic research it generates viable, effective public policy responses to important economic problems that profoundly affect the quality of life in the United States and abroad.

Levy Economics Institute
P.O. Box 5000
Annandale-on-Hudson, NY 12504-5000
<http://www.levyinstitute.org>

Copyright © Levy Economics Institute 2018 All rights reserved

ISSN 1547-366X

ABSTRACT

During the period leading up to the recession of 2007–08, there was a large increase in household debt relative to income, a large increase in measured consumption as a fraction of GDP, and a shift toward more unequal income distribution. It is sometimes claimed that these three developments were closely linked. In these stories, the rise in household debt is largely due to increased borrowing by lower-income households who sought to maintain rising consumption in the face of stagnant incomes; this increased consumption in turn played an important role in maintaining aggregate demand. In this paper, I ask if this story is consistent with the empirical evidence. In particular, I ask five questions: How much household borrowing finances consumption spending? How much has monetary consumption spending by households increased? How much of the rise in household debt-income ratios is attributable to increased borrowing? How is household debt distributed by income? And how has the distribution of consumption spending changed relative to the distribution of income? I conclude that the distribution-debt-demand story may have some validity if limited to the housing boom period of 2002–07, but does not fit the longer-term rise in household debt since 1980.

KEYWORDS: Consumption; Debt Dynamics; Household Debt; Income Inequality; National Income and Product Accounts

JEL CLASSIFICATIONS: D31; E21

1. INTRODUCTION

A number of recent accounts of macroeconomic developments leading up to the recession of 2007–08 posit a strong link between income distribution, household debt, and aggregate demand. In these accounts, increasing household debt-income ratios reflect increased consumption spending by households relative to income. Debt rose disproportionately in the lower parts of the income distribution because lower-income households borrowed in order to maintain expected levels of consumption growth despite slower income growth. Debt-financed expenditure, the story continues, made an important contribution to the growth of aggregate demand until it was interrupted by the financial crisis of 2008.¹

In this paper, I ask whether this story is consistent with the available evidence. This paper's distinct contributions are: a focus on the debt-distribution-demand story as a whole, rather than particular causal links; and careful attention to the historical accounting involved. The latter involves both attending to the full set of flows relevant to changes in household balance sheets, and distinguishing the cash flow variables relevant to balance sheet changes from others that they are typically grouped with in the national accounts.

I am concerned with five questions, three of them aggregate and two of them cross-sectional.

1. To what extent does household borrowing finance consumption? Is it *prima facie* plausible that there is a close link between credit flows to the household sector and shifts in consumption spending relative to income?
2. How much of the apparent rise in consumption spending over the past four decades reflects an increase in consumption spending by households? This is important because a significant fraction of reported consumption does not involve any monetary outlay by households and cannot contribute to changes in balance sheets.
3. To what extent do changes in the household debt-income ratio over the past four decades reflect increased borrowing by households, and to what extent do they reflect other factors?

¹ For a sympathetic survey of this literature, see van Treeck (2014).

4. How is household debt, both levels and changes, distributed across incomes?
5. How has the distribution of consumption across households evolved relative to the income distribution?

All of these questions are essential to evaluating the debt-distribution-demand link, but they are not always explicitly posed.

In response to these questions, this article presents five propositions.

1. *Household debt normally finances assets.* Much economic theory and policy debate focuses on consumption loans as the typical form of household credit. But in fact, the great majority of household debt is incurred to finance asset ownership—homes most importantly, as well as autos and the quasi-asset of educational credentials. These assets are expected to generate a future stream of income or equivalent services. Debt-financed asset acquisition may or may not contribute to aggregate demand, but it does not make sense to think of it in terms of tradeoffs between current future consumption or as a substitute for consumption spending financed out of current income.
2. *Changes in household debt-income ratios are driven mainly by the difference between interest and growth rates.* Most discussions of changes in household debt-income ratios (and other sectoral debt ratios) implicitly assume that changes in the ratio reflect variation in borrowing behavior. But logically, this need not be the case—debt-income ratios also change as a result of interest on existing debt, nominal income growth, and write-offs of debt. As it turns out, most of the evolution of the aggregate household debt-income ratio over the past 50 years is driven by these other factors, rather than by variation in the pace of new borrowing. While it is true that borrowing was historically high for several years in the 2000s, the long-term rise in the household debt-income ratio is entirely accounted for by higher interest rates relative to growth rates, compared with the previous decades.
3. *Household consumption spending has been flat since 1980.* The supposed rise in household consumption relative to income plays an important role in many accounts of the links between income distribution, household debt, and demand. But the long-run rise in household consumption reported in the national accounts is entirely accounted for by a combination of: (1) imputed nonmonetary expenditure, mainly owners' equivalent rent;

and (2) third-party spending on behalf of households, mainly public and employer expenditure on health insurance. It may be reasonable to classify these spending flows as consumption for some purposes, but since they do not involve any money outlays by households it is logically impossible for them to affect household balance sheets.

4. *Most debt is owed by households near the top of the income distribution.* Given that the great majority of household debt finances assets, and asset ownership is concentrated near the top of the income distribution, it should not be surprising that most household debt is also found among higher-income households. Over 50 percent of household debt is owed by the top income quintile, and less than 5 percent is owed by the bottom quintile. There is little reason to believe that this distribution shifted downward significantly during the housing boom period of the 2000s.
5. *Consumption inequality appears to have tracked income inequality.* Unlike household income and balance sheets, there is little reliable data on the distribution of consumption across households. Efforts to measure changes in the distribution of consumption use a variety of methodologies and reach a variety of conclusions. But a large fraction of recent studies find that, over recent decades, the distribution of consumption spending has more or less tracked the distribution of income.

I support these propositions with a mix of descriptive statistical evidence and reviews of the empirical literature.

For the full period from 1980 through the Great Recession, it is hard to tell a story that links the rise in household leverage to increased income inequality or to a rise in household consumption relative to income.² These three phenomena, despite their coincidence in time, seem to involve several distinct stories. Stagnant incomes in the lower part of the distribution have not been compensated for by increased borrowing, but have simply led to stagnant living standards. Rising household debt-income ratios are primarily due to the secular increase in interest rates relative to growth rates following the Volcker shock. And consumption demand has been supported by a mix of higher consumption spending among high-income households, and the

² Throughout this paper, the terms “household leverage” and “household debt-income ratio” are used interchangeably.

increasing volume of social spending classified as private consumption in the national accounts.

For the housing boom period of 2002–07, the distribution-debt-demand story is more plausible. As will be discussed in section 2.2, this period saw a significant increase in net funds flowing to households through mortgages and related forms of housing credit, which was potentially available to finance consumption. This period also saw a downward shift in the distribution of household debt—not to the bottom half of the distribution, which continued to account for a trivial fraction of household debt, but within the top third. And unlike the full post-1980 period, the 2000s did indeed see an increase in consumption spending and residential investment spending (which also contributes to demand) relative to household income. It is not clear that the debt-distribution-demand story is correct even for this shorter period—the largest rise in consumption spending came in the late 1990s, prior to the big increase in borrowing, and appears to have been concentrated at the top of the income distribution. But as applied narrowly to the five or so years before the recession, a story in which demand received a substantial boost from credit-fueled spending by middle-income households is certainly reasonable. For the longer post-1980 period, it is not.

2. DEBT IS MAINLY INCURRED TO FINANCE ASSET POSITIONS, NOT CONSUMPTION

2.1 The General Case

In orthodox economic theory, household debt is normally conceived of as consumption loans. Households borrow in order to achieve a path of consumption different from their path of income. A classic example is Samuelson (1958).³ In the conventional version, lifetime consumption is still equal to lifetime income; consumption is just being shifted over the lifecycle. In more heterodox versions, credit-market borrowing can result in a consumption path that does not converge with the path of income, resulting in a debt stock that rises until some financial constraint is reached. (Orthodox theory is willing to contemplate such paths only for

³ Arguably the purpose of the consumption loan model in this paper has been misinterpreted. Samuelson's goal was not primarily to analyze interest rates in a world of consumption loans, but to demonstrate the efficiency of public retirement provision by creating a model in which private retirement saving would be inefficient (Mehrling 2014).

the public sector.) But whether or not the intertemporal budget constraint binds, the role of debt in this framework is to finance consumption in excess of current income. Incurring debt then is equivalent to negative saving, and accumulating assets is equivalent to positive saving. Households whose cumulative consumption to date exceeds their cumulative income hold debt, and households whose cumulative income exceeds their cumulative consumption hold assets.

This analytic framework is reasonable for discussing the debt of sovereign governments. Sovereigns do use credit-market borrowing to bridge gaps between current expenditure and current income, and do not usually accumulate significant (financial) asset positions. For other economic units, the orthodox framework described in the previous paragraph is less suitable. For households, businesses, and subnational governments, debt is mainly incurred to finance assets, not to finance current expenditure. Businesses may also issue debt to finance operating losses. But for households, debt is overwhelmingly used to finance asset positions. So debt cannot be thought of in terms of a tradeoff between current and future expenditure. Debt transactions do not normally involve any intertemporal tradeoffs. Rather, they involve tradeoffs between two future payment streams—the income or services produced by the asset and the interest and principal on the debt that finances it—which will take place over comparable periods. Indeed, far from debt being a tool to move future income into the present, most economic units make considerable efforts to match the time profile of assets and liabilities.

Debt is not simply used by households to finance asset ownership in general. It finances assets that are strongly linked to the household's reproduction as a social and wage-earning unit.⁴ Homes, cars, and—more recently—higher education account for the overwhelming majority of household borrowing. Households typically borrow early in their lifetimes to purchase these assets, but the purpose is not to smooth consumption. On the contrary, the need to acquire these assets tends to amplify variation in current consumption, since all these forms of borrowing include substantial direct out-of-pocket costs, as well as indirect costs such as foregone wages during college attendance, and it is not normally possible to finance the entire purchase of these assets with debt. So the transactions in which households incur debt early in their lifecycles

⁴ This is widely recognized in public discussions of debt, if not by economists. For example, a 2016 article in the *Los Angeles Times* wonders if younger Americans have “abandoned what used to be one of the biggest rites of passage into adulthood: buying a car” (“Millenials and Car Ownership? It’s Complicated,” December 26).

typically involve a *reduction* in current consumption. The familiar lifecycle model has little or no relevance for actual household borrowing. It is a puzzle why orthodox theory focuses so much on a category of borrowing that accounts for only a trivial share of household debt, while the fact that households—like businesses—borrow to finance investment has been lost to view. By the same token, there is no connection between an increase in debt and a decrease in saving. Since the most important form of household borrowing—the mortgage—involves both acquisition of an asset and a substantial down payment out of current income, higher household debt normally implies *higher* household saving.

For these reasons, household asset and debt positions normally expand together. By far the most important form of household debt—accounting for more than 70 percent of total household debt in the US—is home mortgages (Brown et al. 2013). The next most important forms of household debt are auto loans and student debt. The latter does not finance an asset recognized in the national accounts, but college degrees do function as assets in many respects. In the 2013 Survey of Consumer Finances (SCF), 80 percent of household debt is reported to be incurred to finance the purchase of a primary residence. Another 4 percent is incurred to purchase nonprimary residences and to improve existing residential properties. Five percent finances vehicle purchases and 7 percent finances education. Consumption loans account for only 4 percent of household debt (See table 1).

Table 1: Share of Household Debt by Purpose, Various Years

	1989	1995	2001	2007	2013
Primary residence					
Purchase	71.3	78.0	77.2	79.8	79.6
Improvement	2.4	2.0	2.0	2.3	1.7
Other residential property	2.3	2.4	1.1	0.5	0.5
Nonresidential investments	5.1	1.6	3.1	2.2	2.1
Vehicles	10.5	7.5	7.7	5.5	5.1
Goods and services	5.2	5.4	5.5	5.8	4.0
Education	3.1	3.1	3.5	4.0	7.1

Source: SCF, various years

Because debt primarily finances assets, the negative relationship between debt and assets predicted by standard theory does not exist for households. Rather, debt and assets are positively correlated. A positive correlation between household debt and household assets is observed in the SCF in all years, exceeding 0.4 even in the housing bubble years of the mid-2000s. This positive relationship between debt and assets is present whether or not one controls for income.

Because assets are acquired in conjunction with definite lifecycle events, and because they are required for particular forms of wage labor and household production, in general debt does not offer a margin on which adjustments can be made in response to shortfalls of current income. On the contrary, since declining income makes households less able to afford the upfront costs of asset ownership, a fall in income will normally be associated with less borrowing, not more. Concretely, households borrow in order to own a home, to go to college or to send a child to college, and to own a car. These are not forms of consumption but productive assets. All of them involve upfront and operating costs, as well as debt finance.

2.2 The 2000s Housing Boom: An Exception to the General Case?

It may reasonably be argued that the picture presented in table 1 is incomplete. Debt that notionally is incurred to finance an asset position may still pay for increased consumption, to the extent that it generates positive cash flows in some period. In particular, it is often claimed that during the housing boom period of the 2000s households “used their homes as ATMs,” with cash-out refinancings or second mortgages generating funds for other purposes. During the period 2002–07, these equity-extracting transactions averaged over \$350 billion annually; home-equity based revolving credit added another \$75 billion (Haughwout et al. 2014). Similarly, for a given volume of home purchases, lower down payments imply greater funds available for other purposes. One can imagine a case in which average down payments fell substantially; this would increase funds available for consumption even though all mortgage borrowing would still be for the purpose of acquiring a house. So the small fraction of household debt that takes the form of consumption loans is not necessarily informative about the extent to which consumption is financed by debt.

At the same time, as stressed by Foote, Loewenstein, and Willen (2016), we cannot take gross flows like those cited in the previous paragraph at face value either. To answer the question of

how much mortgage debt was funding household spending other than housing investment, we have to look at the *net* flow of funds to households via mortgage debt—new loans and cash-out refinancings on the one hand, versus principal and interest payments on the other hand. We then compare this to investment spending on owner-occupied housing, namely: (1) purchase of new homes by households; (2) improvements to existing homes; and (3) brokers fees and other transaction costs associated with changes in ownership. Note that the national accounts class all three of these uses as residential investment by households, with fees and improvements typically totaling about the same as new construction. Neither of the second two forms of residential investment create new equity for homeowners. So equity-reducing transactions may still be financing housing investment, rather than making funds available for consumption. During the housing boom period, refinancings and second liens were often described as being intended for home improvement; insofar as they were actually used for this purpose, they were not available for other purposes. Similarly, a rise in housing prices and/or faster turnover of the housing stock will mean a greater flow of payment for broker services and related transaction costs. All else equal, this will produce some combination of higher mortgage debt and lower equity, without freeing any funds for consumption.

Figure 1 and table 2 give a comprehensive accounting of these various flows.⁵ The figures show four sources of funds: new first liens, junior lien activity (new loans net of payoffs and amortization), refinancings, and net additions to home equity revolving credit. And they show five uses of funds: new investment in single-family homes, improvements in owner-occupied homes, and brokers' fees and related transactions costs, as well as principal and interest payments for mortgages on owner-occupied homes. The four sources and amortization of existing loans are taken from the New York Fed's quarterly Consumer Credit Panel; the other three uses are taken from the National Income and Product Accounts.⁶ The figures are given as percentage of potential GDP to correct for the rise in volumes associated with rising GDP, while avoiding the distorting effect of the large movement in actual GDP around the Great Recession.

⁵ The one important omission is transfers of ownership of existing housing units between the household sector and other sectors. To the extent that the housing boom period saw a net shift of housing units from rental to owner occupancy, figure 1 and table 2 overstate the net funds from mortgages available to households for nonhousing purposes.

⁶ New first-lien mortgages, refinancing, junior lien activity, and amortization are not broken out in the main Consumer Credit Panel reports, but are given in a 2014 report based on the same underlying data (Haughwout et al. 2014).

Table 2: Housing-Finance Sources and Uses of Funds for Household Sector as Percent of Potential GDP

	1999–2001	2002–07	2008–13
Sources			
(1) New mortgages	4.8	5.4	1.9
(2) Refinancing	0.3	1.5	0.5
(3) Junior liens	0.4	1.1	-0.1
(4) HELOCs	0.2	0.6	-0.1
Total sources (sum of 1 to 4)	5.7	8.5	2.2
Uses			
(5) Amortization	0.9	1.2	1.4
(6) Interest	3.2	3.1	2.7
(7) New housing	2.3	2.7	0.9
(8) Improvements	1.0	1.2	1.0
(9) Fees and commissions	0.9	1.2	0.7
Total uses (sum of 6 to 10)	8.3	9.3	6.6
Net funds (sources - uses)	-2.6	-0.8	-4.5

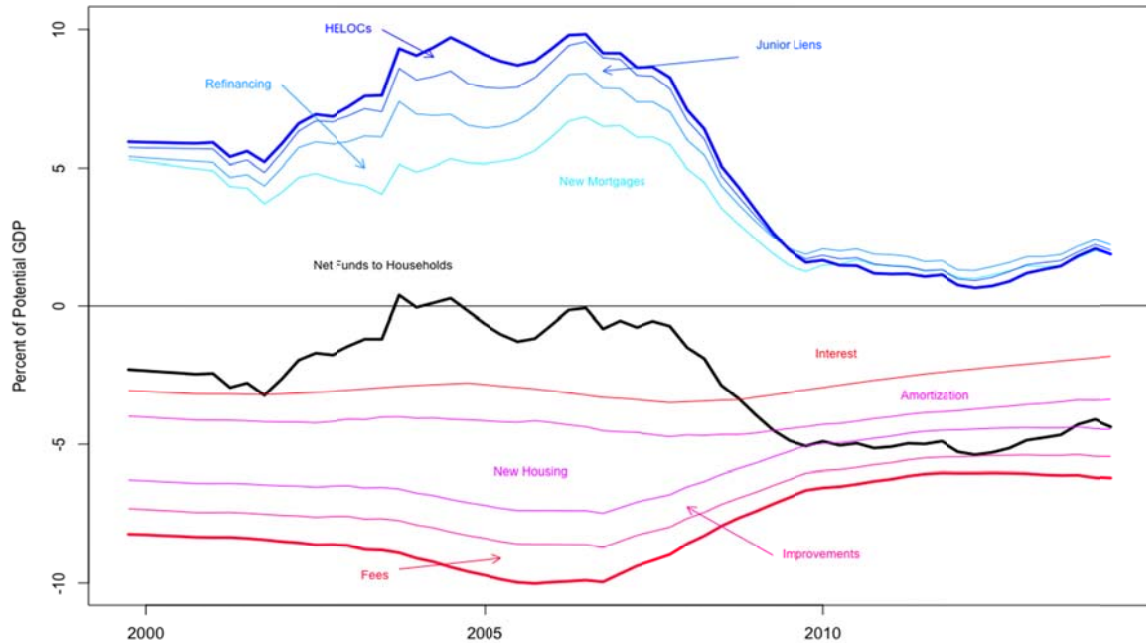
Source: New York Fed Quarterly Report on Household Credit and Debt (4); BEA National Income and Product Accounts (6–9); Haughwout et al. (2014) (1–3, 5)

What do we see? Between 1999 and 2005, funds flowing to the household sector through home loans increased by about \$750 billion. The majority of this increase took the form of new mortgages, with refinancings, junior liens, and home equity lines of credit (HELOCs) making up about equal shares of the remainder. If we look at the 2002–07 period (the years in which homeowners were withdrawing significant equity), total funds flowing from home-based credit reached 9 percent of GDP, which is 3 points above the 1999 level. At the same time, uses of funds were close to 1.5 percent above the 1999 level, an increase due in about equal parts to higher new housing investment and commissions and related transactions costs (spending on improvements on owner-occupied homes did not change). So relative to the 1999 baseline,

households saw a net cash inflow of about 1.5 percent through housing finance available for other purposes. This is about half the gross inflow from refinancings, junior liens, and HELOCs.

A closer look suggests that there were two distinct phases to the housing boom (see figure 1). In the first period, 2002–04, the large increase in funds flowing to households through mortgages was mainly due to equity extraction—annual net cash from refinancings, junior liens, and home-equity-based revolving credit balances increased by a total of 2.5 percent of GDP, while new mortgage lending rose by only 1 percent of GDP. Net borrowing against equity increased from 0.5 percent of GDP at the start of 1999 to a peak of 4.4 percent of GDP in 2004Q3, after which it fell steadily, to 2.4 percent of GDP by the end of 2007 and below zero starting in 2010. New mortgage lending followed a somewhat different trajectory. In the first part of the housing boom, there was no increase in new mortgage lending, which stood at a bit over 5 percent of GDP in mid-2005, the same level as in 1999. But over the next two years new mortgage borrowing rose steeply, up to a peak of 6.5 percent of GDP in mid-2007. By this time the three equity-extraction flows fell by about 1.5 percent of GDP, leaving overall gross inflows approximately constant in the years leading up to the recession. (After 2008, the junior lien and revolving credit flows quickly turned negative, as households paid down existing balances more rapidly than they borrowed.) Meanwhile, on the uses side, new housing investment and brokers' fees and commissions, not surprisingly, rose more in the second period. But on the whole the movements in sources of funds were more dramatic than the movements in uses of funds.

Figure 1: Housing-Finance Cash Flows To and From the Household Sector, 1999–2013



Notes: The blue lines in the top half show housing-finance sources of cash for the housing sector: new mortgages net of payoffs, second mortgages (junior liens), refinancings, and net additions to home-equity based revolving credit (HELOCs and similar). The red lines in the bottom half show household sector housing-finance uses of cash: new construction of single-family housing, improvements of owner-occupied homes, brokers fees and commissions, interest payments on home mortgages, and principal payments (amortization). The heavy blue line shows total sources of funds, the heavy red line shows total uses of funds, and the heavy black line shows net cash flow to the household sector from housing credit, available for consumption or other purposes.

Source: NIPAs, New York Fed Consumer Credit Panel, author’s analysis

In absolute terms, the net flow of funds from housing finance is negative in all years—apart from a couple of quarters in 2004, the housing sector always spends more on investment in new and existing homes, transactions costs, and interest and principal payments on housing debt than it receives from housing-secured borrowing. In this narrow sense, housing credit has never financed consumption. On the other hand, it is true that the net flow of funds to households through housing finance became substantially more positive during the early 2000s. In 2004 and 2006, the net flow was essentially zero. In other words, households in the aggregate were making no net payments for their use of the stock of owner-occupied housing—a fact that testifies to the exceptional character of the 2000s housing boom. It is plausible that this rise in housing-finance sources relative to uses of funds contributed to the rise in consumption spending during the first half of the 2000s. Qualitatively the movements in equity-extracting transactions, gross inflows, and net inflows are all broadly similar. So a story in which increased access to

housing credit leads to increased consumption is *prima facie* plausible for this period. And new housing construction, improvements, and the transactions costs of home sales, while they are counted as investment rather than consumption, do still contribute to demand.

At the same time, magnitudes matter: Just looking at gross equity withdrawals overstates the potential contribution of mortgage finance to household consumption by approximately 100 percent. It is true that annual equity withdrawals increased by about \$300 billion and new mortgage lending by about \$400 billion over the first half of the 2000s, but residential investment and payments on existing mortgages increased by about \$525 billion over the same period. About half the equity withdrawals in this period were, in effect, paying for the costs of the bubble itself—increased interest on past loans and transaction costs associated with the faster pace of sales. In addition, a rise in housing-finance sources of funds relative to uses, as occurred in this period, need not have a direct link with consumption spending. There are other margins on which household finances can adjust. In particular, household acquisition of financial assets accelerated during the housing boom period, absorbing at least some of the funds generated by increased mortgage borrowing relative to housing investment. A modest amount (about 0.3 percent of GDP) was also absorbed by higher interest payments on nonhousing debt. As discussed in section 4, monetary consumption expenditure by households (which is what funds from housing credit would finance) increased by much less than the headline consumption figures suggest and, importantly, did so mainly in the late 1990s, not in the period of maximum inflows in 2002–07. Third, a key point here is how exceptional the housing bubble period was. During this period, it is true, there was a substantial increase in mortgage borrowing, which financed higher residential investment and, perhaps higher consumption spending as well. But this is a period of less than five years, and it was more than reversed in the years following the end of the boom. The rise in household debt relative to income, on the other hand, is a secular phenomenon, and has only been modestly unwound in the years since 2007. So while the housing boom and the associated developments in household balance sheets are an important phenomenon in their own right, they should not be treated as equivalent with the larger question of rising household leverage. As discussed in section 3, while household borrowing did increase in the housing boom period, the longer-term rise in debt-income ratios is due to other factors—the rise in effective interest rates relative to nominal income growth.

Finally, the aggregate figures do not address the question of distribution. During the housing boom period, there was some shift in household debt downward in the income distribution: The peak debt-income ratios shifted from around the 85th to the 75th income percentile. But the majority of household debt continued to be owed by households in the top fifth by income, and absolute debt levels continued to rise monotonically with income.

Overall, we can say that while it is wrong to treat consumption loans as the generic form of household borrowing, it is plausible that during the 2000s, some significant part of the increase in funds flowing to households through housing credit was available to finance consumption.

3. CHANGES IN HOUSEHOLD DEBT RATIOS ARE NOT MAINLY DRIVEN BY VARIATION IN NEW BORROWING

An assumption in most discussions of household debt is that changes in the debt-income ratio are equivalent to new borrowing. This implicitly assumes that the growth rates of income are equal to the average interest rate on household debt, and that defaults and other nonborrowing changes in the stock of debt do not play an important role in the evolution of the debt ratio. Neither of these assumptions is justified.⁷

For any unit or sector, one can define the evolution of leverage over time as:

$$b_{t+1} = d_t + \left(\frac{1+i}{1+g+\pi}\right)b_t + sfa_t \quad (1)$$

$$\Delta b_t = b_{t+1} - b_t = d_t + \left(\frac{i-g-\pi}{1+g+\pi}\right)b_t + sfa_t$$

where b is the ratio of gross debt to income, d is the ratio of new borrowing (that is, deficit net of interest payments) to income, i is the *nominal* interest rate, g is the *real* growth rate of GDP, and π is the inflation rate. sfa is the stock-flow adjustment term and captures any difference in debt

⁷ The analysis in this section is based on Mason and Jayadev (2014, 2015).

stocks that cannot be attributed to either interest payments or new borrowing. This last term is needed to capture measurement errors that lead to the observed debt stocks being different from those implied by the previous period’s debt stock and borrowing. It is also needed to account for defaults, and other developments that change the outstanding stock of debt independent of the flows of income and expenditure.⁸ Equation 1 is well-known to macroeconomists as the law of motion of government debt and in that context has been called “the least controversial equation in macroeconomics” (Hall and Sargent 2011). Whatever sector it is applied to, the equation is an accounting identity—it is true by definition.

One useful application of equation 1 is to decompose changes in debt ratios into the contributions of each of the variables. In order to separate out the contributions of the variables, we use a linear approximation of the equation:

$$\Delta b_t \approx d_t + (i_t - g_t - \pi_t - c_t)b_{t-1} \quad (2)$$

Here c is the fraction of debt charged off due to default. A key point is that d gives the net new funds flowing to households through the credit system for that period. A rise in new borrowing, for whatever purpose, must show up as a rise in d .

The typical application of this equation is to decompose changes in the public-debt-to-GDP ratio over time, generally into changes due to the primary balance, the real growth rate, the nominal interest rate, and inflation. Decompositions of the changes in the debt-GDP ratio have been carried out both for the US and for various other countries (for example, Aizenman and Marion 2009; Abbas et al. 2011; Hall and Sargent 2011). A common finding in these papers is that changes in growth, inflation, and interest rates play a large role in the evolution of public-debt-GDP ratios historically. As it turns out, the same is true of US household debt.

⁸ “Stock-flow consistency” may be a desirable feature of an economic model, but it is definitely not a feature of real economies, and even less of economic data.

Table 3: Decomposition of Change in Household Debt-Income Ratio, in Percentage Points per Year

	Change in Debt Ratio	Attributable to:				
		Primary Deficit	Interest	Growth	Inflation	Default
1946 to 1963	2.9	2.6	2.9	-1.5	-0.8	-0.0
1964 to 1983	0.2	0.8	6.4	-2.6	-4.1	-0.2
1984 to 1993	3.2	-1.1	9.9	-2.0	-3.0	-0.5
1994 to 1999	1.7	-0.9	9.9	-4.4	-2.0	-0.8
2000 to 2007	5.8	5.7	9.5	-4.3	-3.3	-1.5
2008 to 2011	-4.1	-6.6	9.1	1.2	-2.2	-5.1
1946 to 1983	1.5	1.7	4.7	-2.1	-2.6	-0.1
1984 to 2007	2.8	0.1	9.7	-2.9	-2.8	-1.5

Source: Mason and Jayadev (2015)

Table 3 shows annual changes in leverage and the contributions to the change in primary deficits and interest, growth, inflation rates, and defaults. Our measure of income includes only cash payments received by households after taxes; it excludes both imputed noncash income and payments on behalf of households made by third parties. As discussed in section 4, these exclusions are necessary because credit-market borrowing depends on the difference between money outlays and money income. The stock variable b is the end-of-period value of total credit-market liabilities, divided by adjusted personal income. Debt, as defined here, does not include noncredit liabilities. These are a small portion—less than 2 percent in recent years—of total household liabilities, consisting mainly of security credit. Including these liabilities in our debt measure would not affect our qualitative results. Borrowing is the year-over-year change in household debt, plus the amount of debt written-off by default. Adding defaults is necessary because borrowing flows are not observed directly in the financial accounts; credit flow series are computed from the change in liabilities. The household primary deficit, d , is calculated as

borrowing minus interest payments, divided by personal income as defined above. This is equivalent to the way the primary deficit is calculated for governments. The effective interest rate, i , is total interest payments divided by the stock of debt at the start of the period. In other words, it is the average interest rate on the current debt stock, not the marginal rate on new borrowing. Growth, g , and inflation, π , are the percent changes in the level of adjusted income and the personal consumption expenditure (PCE) deflator, respectively, from the previous year. The fraction of debt written-off through default, c , is taken from Mason and Jayadev (2015).

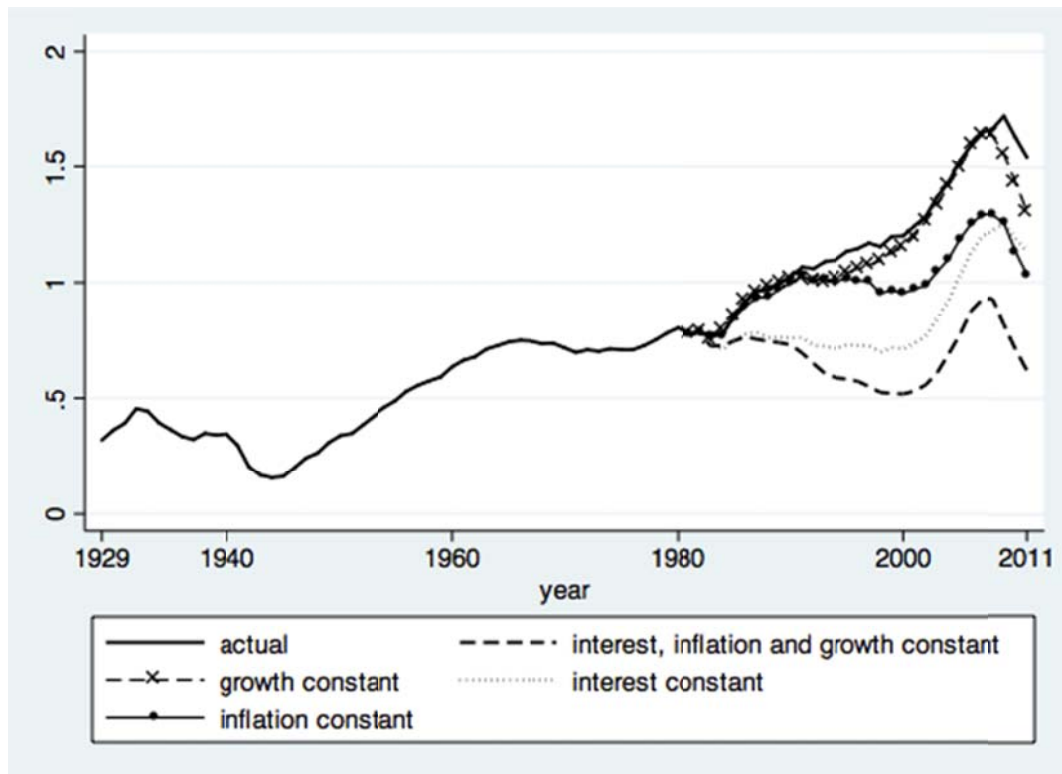
The primary deficit is, again, the deficit net of interest payments—that is, new borrowing or the net flow of funds to households through credit system. The contribution of growth, inflation, and effective interest rates to the change in leverage is equal to the value of the variable multiplied by the debt stock at the end of the previous period. A negative value represents a component reducing in leverage and a positive value one increasing it. The table shows that over some periods—especially between 1945 and 1980, and in the housing boom period of the 2000s—changes in leverage track new borrowing (the primary deficit) closely. But over other periods the two correspond less closely, or even move inversely. For our purposes, the most important comparison is between the period 1964–83 and the period 1984–2011. Looking at the last two lines of table 3, we see that households were running primary deficits (expenditure exceeded income) in the first period, but not in the second, yet household leverage was essentially flat in the first period and rose sharply in the second.

Over the period 1984–2012, the household sector debt-income ratio almost exactly doubled, from 0.77 to 1.54. Over the preceding 20 years, debt-income ratios were essentially constant. Yet, over the period from 1963–83, households ran cumulative primary deficits equal to 20 percent of income, compared with cumulative primary deficits of just 3 percent of income over 1984–2012. So if the goal is to explain the difference in household debt growth in the decades before and after 1980, the answer cannot involve any change in borrowing behavior. The entire growth of household debt after 1983 is explained by the combination of higher interest payments, which contributed an additional 3.3 points per year to leverage after 1983 compared with the prior period, and lower inflation, which reduced leverage by 1.3 points per year less than in the prior period. The question is not why households borrowed more after 1980; they did not. The question is why the operation of the monetary system increased the value of already-

incurred debt much more rapidly after 1980 than before.

Another way of seeing the real causes of rising debt-income ratios in the 1980s is to ask what would have been the trajectory of household leverage if growth, interest, and/or inflation rates had remained constant. We can do this straightforwardly by iteratively applying equation 1 to the previous year's debt ratio, using the actual values for the primary deficit but the pre-1984 average values for i , π , and g . The result of that simulation exercise is shown in figure 2. The heavy black line in the figure shows the actual trajectory of household leverage, while the dashed line shows what the trajectory would have been if interest, growth, and inflation rates had been fixed at their 1946–83 average levels for the whole period. The other three lines show scenarios with growth, inflation, nominal interest rates, or real interest rates ($i-\pi$) fixed at their average levels while the others vary historically. The main message of the graph is that household borrowing has made *no* contribution to the long-term growth of household debt; if interest rates, inflation, and growth had been constant, then the actual pattern of household borrowing would have led to roughly stable debt-income ratios. Leverage would even have decreased slightly over the full 1984–2012 period. Second, while negative income growth increased leverage in 2008–09 (and higher growth reduced leverage somewhat in the late 1960s), the counterfactual trajectory is closest to the actual one in the constant-growth scenario. The big differences come from higher interest rates (the overwhelming factor in the 1980s) and lower inflation (important more recently). Apart from the housing boom and its aftermath, changes in household debt-income ratios since 1980 have not been driven by changes in borrowing. The common narrative of the profligate American household is applicable at most to a short period of sharply increased borrowing in the mid-2000s (following which households have cut back more than proportionately).

Figure 2: Counterfactual Evolution of Household Leverage, 1983–2012



Notes: The figure shows the result of simple simulation exercises where the real growth rate of income, the inflation rate, or the nominal interest rate are fixed at their 1946–83 averages, while the other variables and the household primary balance take their historical values.

While this analysis shows that the rise in aggregate debt ratios cannot be explained by higher household borrowing—whether due to more unequal income distribution or any other cause—it is still possible that rising inequality is reflected in the distribution of debt across households. We will return to this question in section 6.

4. THE RISE IN MEASURED CONSUMPTION RELATIVE TO INCOME IS ALL DUE TO IMPUTED AND SOCIAL CONSUMPTION, NOT HOUSEHOLDS' OWN CONSUMPTION SPENDING

The received view on household consumption is that it has increased relative to income. The headline figures from the BEA show personal consumption as a share of disposable personal income rising from around 85 percent in the early 1980s to a high of 94 percent in the mid-2000s. This is often interpreted as meaning that households were spending a greater fraction of

income on consumption, which is in turn often understood to be a factor in the rise in household debt. But careful analysis of the national accounts shows that this natural interpretation is incorrect. The rise in reported personal consumption does not in fact reflect any increase in consumption expenditure relative to money income. The discussion in this section follows Cynamon and Fazzari (2017).

The increase in measured consumption spending as a share of GDP is entirely the result of spending by third parties—mainly government, but also employers—that is counted as household spending in the national accounts. The most important of these are the public health insurance programs Medicare and Medicaid: their payments to healthcare providers are counted as consumption spending by households in the national accounts. Reasonable arguments can be made for and against this treatment, but it is logically impossible that such payments could contribute to rising household debt, since they do not involve any expenditure by households. Note that the adjusted measure of consumption spending does still show an increase relative to (adjusted) income in the late 1990s and early 2000s, but this is both much smaller and more transitory than the increase in the headline BEA measure.

The most important features of the national accounts that raise reported consumption but do not involve any actual monetary outlays by households are:

1. **“Households” include nonprofits.** For many purposes in the national accounts, the household sector also includes nonprofit institutions like churches, charities, and nonprofit hospitals and universities. Total costs incurred by these institutions less any revenue from sales are counted as consumption spending. In recent years, consumption by nonprofit institutions has accounted for about 2.5 percent of total official consumption.
2. **Homeowners are considered to rent to themselves.** By the standard conventions of the national accounts, anyone who owns their own home is considered to be renting that home to themselves. The BEA imputes the value of that rent as both income and spending for the household sector, even though no money changes hands. These owners’ equivalent rents account for a bit over 10 percent of official household consumption, representing housing services provided by owner-occupied homes.

3. **Third-party health insurance payments are considered household consumption.** All spending on healthcare for individuals is counted as income and consumption for the household sector, no matter who pays for it. This includes all payments to healthcare providers by both employer-sponsored health insurance plans and government health insurance programs such as Medicaid and Medicare. As far as the national accounts are concerned, when people receive medical treatment and Medicare pays for it, that means the federal government sent them a check and they decided to purchase medical care with it. Spending by employer-provided health insurance plans accounts for about 5 percent of official household consumption, and spending by public health insurance programs for about 9 percent.⁹

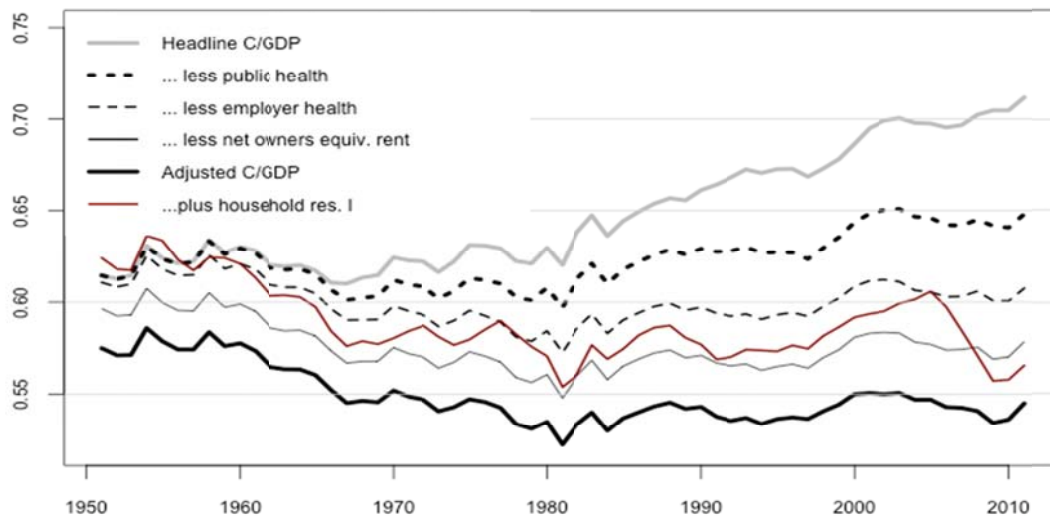
4. **There are large imputed financial services.** Household consumption includes the “services” imputed to households that hold assets that pay less than the market interest rate, or borrow money at more than the market interest rate. The BEA assumes that anyone holding an account at below-market interest is in effect purchasing some financial service from the bank equal in value to the foregone interest. The value of these imputed financial services varies with market interest rates but in recent years has come to about 4 percent of total household consumption.

5. **Pension funds are considered to be directly owned by their beneficiaries.** This does not affect measured consumption spending, since pension transactions do not involve purchases of goods or services, but it does affect household income as reported in the national accounts: Employer contributions to pension funds are considered to be income for the household sector, but disbursements from pension funds are not. This means that a decline in employer contributions relative to benefit payments, as has occurred over the past generation, will reduce household income as reported in the national accounts, but not the actual money income of households.

⁹ It’s worth emphasizing that we exclude only *third-party* purchases of health insurance, which do not involve any monetary outlay by households. Household purchases of health services, including contributions to insurance coverage, are still included in the adjusted consumption measure described here.

In all, nearly a third of what the BEA counts as household consumption involves no cash outlay by households. This share has not been constant; rather, it has increased over time. In fact, as shown in figure 3, the entire increase in reported household consumption since 1980 is accounted for by these items.¹⁰

Figure 3: Official and Adjusted Household Consumption as Share of GDP, 1950–2012



Notes: The adjusted consumption measure includes only cash outlays by households. It excludes nonprofit expenditure, imputed noncash expenditure, and third-party expenditure on behalf of households.

Source: NIPAs, Cynamon and Fazzari (2017), and author's analysis

Figure 3 tells a clear story, which is quite different from the accepted wisdom. Between 1950 and 1980, there was a steady decline in the fraction of GDP accounted for by household consumption; since 1980, the consumption share has been essentially flat, though there was a modest rise in the late 1990s that persisted into the early 2000s. If we look at total expenditure on goods and services (i.e., consumption plus residential investment by households) the rise in the 2000s is much larger, but is fully reversed by 2010. And even at the height of the housing boom, household expenditure by this measure never reaches as high a proportion of GDP as it

¹⁰ About 80 percent of the total increase is public healthcare spending. Owners' equivalent rents play an important role in the steep rise around the year 2000.

did in the 1950s. The largest fraction of the long-run increase in apparent consumption spending is public spending on health insurance (Medicare and Medicaid), which rises from zero at the creation of these programs to about 6 percent of GDP in recent years. Employer spending on health insurance is the next largest component of the apparent rise in consumption, followed by owners' equivalent rent and imputed financial services. Nonprofit spending as a share of GDP is roughly flat over this period. Presenting the figure in terms of household income rather than GDP would tell a similar story. While third-party health spending must be subtracted from income as well as consumption, the fact that 100 percent of this "income" is consumed means that excluding it still lowers the measured consumption share of income. A measure in terms of income would also need to adjust for pension-fund-related flows: Because the period since 1980 has seen a fall in employer contributions to pension funds relative to disbursements, treating pension fund assets as directly owned by households reduces apparent household income, raising the reported consumption share.

The nonmonetary and third-party components of measured consumption may raise the living standards of households in ways comparable to their own consumption spending. But these components cannot contribute to any change in household balance sheets. Debt is incurred or paid down, and assets accumulated or decumulated, as a result of a divergence between cash income and cash outlays. Changes in nonmarket flows or third-party payments cannot directly affect either borrowing requirements or repayment capacity. For example, a reduction in employer contributions to defined-benefit pension funds is reported as a fall in household income in the national accounts; if household expenditure remained unchanged, this would imply a fall in the personal savings rate. But it is logically impossible for such a fall in pension contributions to explain an increase in household borrowing, since employer pension contributions have no direct effect on current household cash flows.¹¹ Similarly, an increase in imputed rents for owner-occupied homes will show up as an increase in consumption, implying a fall in personal savings. But again, this cannot explain an increase in borrowing, since it has no effect on the cash payments made by households.

¹¹Of course if the reduction in contributions eventually results in lower benefits paid out, this will affect household cash flows. But in a historical account of changes in household balance sheets we cannot conflate these two effects, since they may occur decades apart.

5. BALANCE SHEET POSITIONS EVOLVE AUTONOMOUSLY FROM REAL PRODUCTION AND CONSUMPTION FLOWS

The overarching argument of sections 2 through 4 can be summarized as follows. Many discussions of household debt implicitly imagine a straightforward relationship between saving, debt, current expenditure, and income. In this implicit framework, rising debt-income ratios, higher borrowing, and lower saving are all interchangeable concepts. The question “Why have households borrowed more?” is equivalent to “Why have households saved less?” And either way, any spending that raises debt and reduces saving is also understood to contribute to aggregate demand.

This conception is laid out in figure 4. Note that this figure and the following one show accounting rather than causal relationships. A minus sign in the link means the relationship is negative. In this simple story, debt positions are simply the cumulated excess of consumption spending over income (and asset positions are the cumulated excess of income over expenditure).

We start with households’ decision to consume more or less out of their income. Implicitly, all household outlays are for consumption, or at least this is the only flow of household spending that varies significantly. An additional dollar of household consumption spending means an additional dollar of demand for goods and services; it also means a dollar less of savings. A dollar less of savings equals a dollar more of borrowing. More borrowing means higher debt, or—equivalently, in this view—a higher debt-GDP ratio.

There is nothing wrong, in principle, with thinking in terms of the logic of figure 4, or constructing models on that basis. Social science is impossible without abstraction. It is often useful, even necessary, to think through the implications of a small subset of the relationships between economic variables while ignoring the rest. But when we turn to the concrete historical changes in macroeconomic quantities like household debt and aggregate demand in the US, the *ceteris paribus* condition is no longer available. We can’t reason in terms of the hypothetical case where all else was equal, but must take into account all the factors that actually did contribute to those changes.

Figure 4: A Simple Accounting Logic for Household Debt

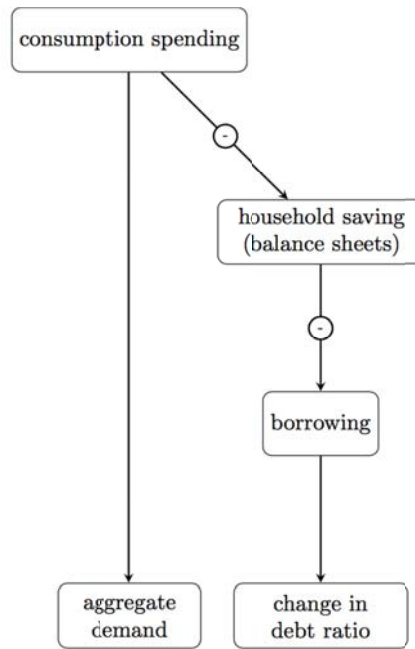
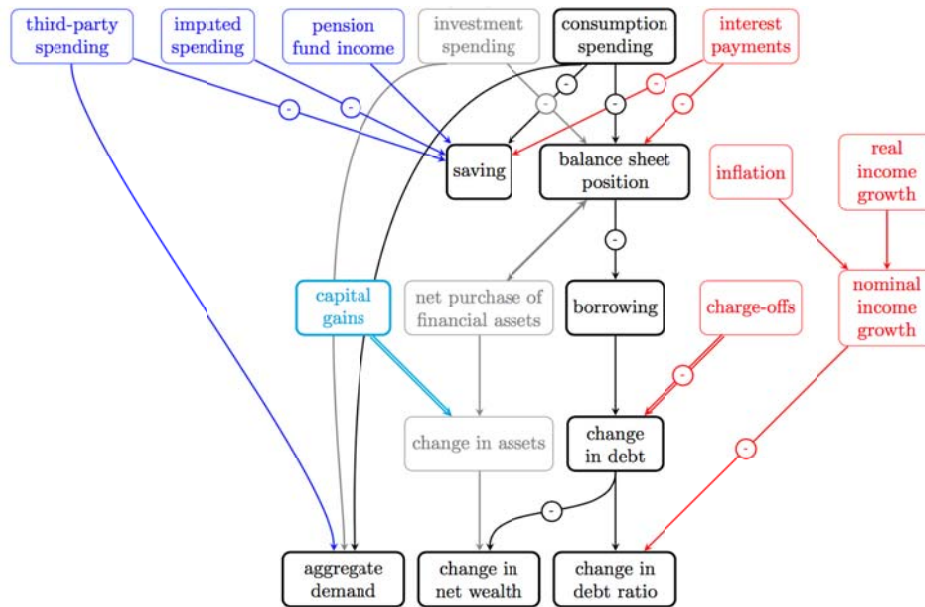


Figure 5: A Fuller Accounting Logic for Household Debt



Thus, to account for the historically observed changes in household balance sheets, we need a picture more like figure 5. The links shown here are not just valid in principle; all of them are quantitatively important for some of the historical variation we are interested in. Figure 5 shows a broader set of factors that we need to include in a historical account of household sector balances. Again, this is not about cause and effect. The links shown here are accounting relationships. You cannot explain the outcomes at the bottom of the figure without the factors shown here.

The central links are the same as in the previous diagram. It is still true that higher household consumption spending reduces saving and raises aggregate demand, and contributes to lower saving and higher borrowing, which in turn contributes to lower net wealth and an increase in the debt ratio. Note, though, that saving is distinguished from balance sheet improvement. The economic saving used in the national accounts is distinct from the financial saving that results in changes in the household balance sheet.

In addition to the factors the simple debt-demand story in figure 4 focuses on, we also have to consider: the various actual and imputed payment flows that the national accounts attribute to the household sector, but that do not involve any money payments to or from households (blue); the asset side of household balance sheets (gray); factors other than current spending that contribute to changes in debt-income ratios (red); and the change in the value of existing assets (cyan).

The first (blue) set of factors are discussed in section 4. Amounting to approximately one-quarter of both household income and consumption spending in the national accounts, these are transactions that involve no actual money income or payments for households, and thus cannot affect household balance sheets. They include, first, payments by third parties for services used by households, mainly employer-paid premiums for health insurance and payments to healthcare providers by Medicaid and Medicare. These payments are counted as both income and consumption spending for households, exactly as if Medicare were a cash transfer program that recipients then chose to use to purchase healthcare. If we are interested in changes in household balance sheets, we must exclude these payments, since they do not involve any actual outlays by households (but they still do contribute to aggregate demand). Second, there are imputed

purchases where no money changes hands. The most important of these are owners' equivalent rent and the imputed financial services that households are supposed to purchase (paid for with imputed interest income) when they hold bank deposits and similar assets paying less than the market interest rate. Like the third-party payments, these imputed interest payments are counted as both income and expenditure for households. Owners' equivalent rent is also added to household income, but net of mortgage interest, property taxes, and maintenance costs. Finally, the national accounts treat the assets of pension and similar trust funds as if they were directly owned by households. This means that employer contributions and asset income for these funds are counted as household income (and therefore add to measured saving) while benefit payments are not.¹²

Medicare, Medicaid, and employer-paid health premiums together account for 14 percent of official household consumption, owners' equivalent rent accounts for another 10 percent, and imputed financial services for 4 percent. Consolidating pension funds with households adds about 2 percent to household income. This is down from 5 percent in the 1980s and the decline in this component of income raises apparent consumption-income ratios. Note that while these flows do not involve any monetary outlay by households and thus cannot affect household balance sheets or debt, they do all contribute to measured household saving.

The next set of factors (shown in gray in figure 5) involve household assets. No one denies, in principle, that balance sheets have both an asset side and a liability side, but it is striking how much this is ignored in practice, with net and gross measures used interchangeably. In the first place, we have to take into account residential investment. Purchase of new housing is considered investment, and does not reduce measured saving, but it does of course involve monetary outlay and affects household balance sheets just as consumption spending does. We also have to take into account net acquisition of financial assets. An increase in spending relative to income moves household balance sheets toward deficit; this may be accommodated by increased borrowing, but it can just as well be accommodated by lower net purchases of financial assets. In some cases, higher desired accumulation of financial assets can also be an

¹²Hockett and Alpert (2016) similarly deducts employer pension contributions from household income, but fails to add pension fund disbursements. Pension assets may be counted as assets of the household sector or not, but in either case, contributions and benefit payments must be treated consistently.

autonomous factor requiring balance sheet adjustment.¹³ The fact that adjustment can take place on the asset as well as the liability side is another reason there is no necessary connection between saving and debt growth.

Net accumulation of financial assets affects household borrowing, but not saving or aggregate demand. Residential investment also does not reduce measured saving, but it does increase aggregate demand as well as borrowing. The red line in figure 5 adds residential investment by households to adjusted consumption spending. Household spending on goods and services did indeed increase during the housing bubble period—conventional wisdom is right on that point—but this was a spike of limited duration, not the secular increase that the standard consumption figures suggest.

Again, this is not just an issue in principle; historical variation in net acquisition of assets by the household sector is comparable to variation in borrowing. The decline in observed savings rates in the 1980s, in particular, was much more reflected in slower acquisition of assets than faster growth of debt. And the sharp fall in saving immediately prior to the Great Recession in part reflects the decline in residential investment, which peaked in 2005 and fell rapidly thereafter.

The cyan item is capital gains, which constitutes the other factor (along with net accumulation) in growth of assets and net wealth. For the distribution-debt-demand story we are focused on here, this is not important. But in other contexts it is. In particular, the growth in recent decades in wealth relative to GDP in the US and elsewhere is explained mainly by capital gains on existing assets, not by faster accumulation of wealth via saving (Knibbe 2014; Naidu 2017). Finally, the red items in figure 5 are factors other than current spending and income that affect the debt-income ratio. Mason and Jayadev (2014) call this set of factors “Fisher dynamics,” after Irving Fisher’s (1933) discussion of them in his famous 1933 paper on the Great Depression. Interest payments reduce measured saving and shift balance sheets toward deficit, just like consumption, but they don’t contribute to aggregate demand. Defaults or charge-offs reduce the outstanding stock of debt without affecting demand or measured savings. Like capital gains, they are a change in a stock without any corresponding flow. Finally, the debt-income ratio has a

¹³ This is particularly important for state and local governments. (Mason, Jayadev, and Page-Hoongrajok 2017)

denominator as well as a numerator; it can be raised just as well by slower nominal income growth as by higher borrowing. As discussed in section 3, the long-term increase in household debt-income ratios since 1980 is fully explained by these items—higher borrowing by households plays no role.

6. RISING DEBT IS NOT CONCENTRATED AT THE BOTTOM OF THE INCOME DISTRIBUTION—LOW-INCOME HOUSEHOLDS HAVE LITTLE DEBT

Most stories that link rising debt to increased income inequality imply that the largest rises in debt should be found lower down the income distribution. Evaluating this claim depends, of course, on where the distribution is divided. It is true that debt-income ratios are somewhat lower at the very top of the income distribution—they peak around the 90th percentile. So if the question is framed in terms of the top 5 percent and the bottom 95 percent, then it is true that debt-income ratios are higher, and have risen by more, in the lower part of the distribution (Cynamon and Fazzari 2015). But it would be misleading to treat this as representing a more general downward shift in the distribution of debt.

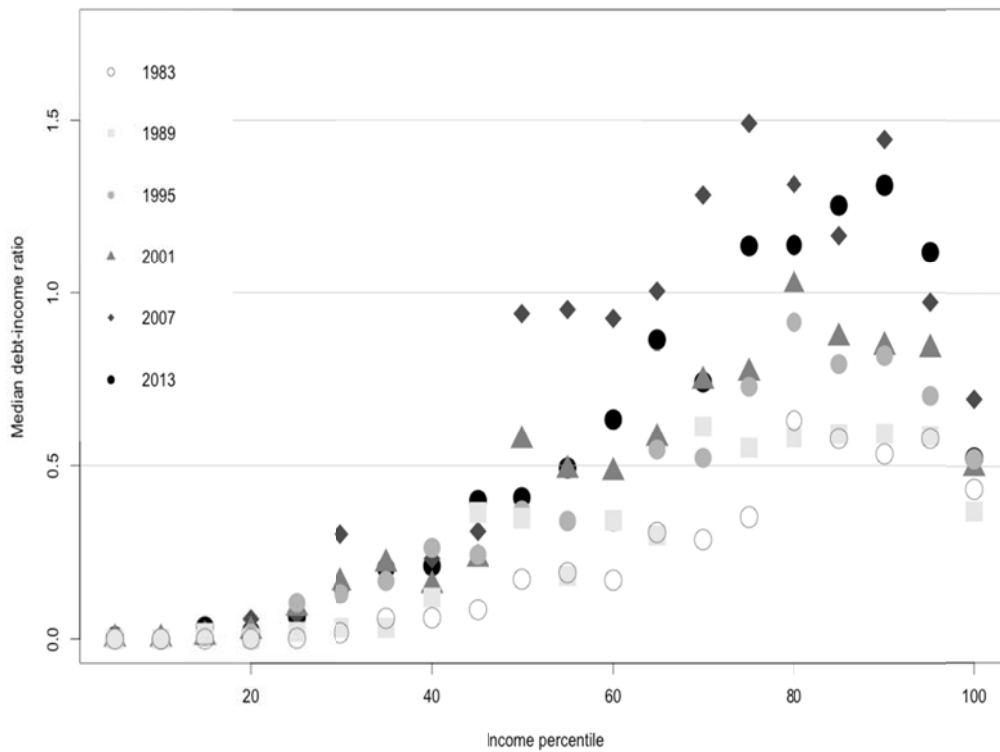
Foote, Loewenstein, and Willen (2016) gives a thorough discussion of the evidence on the shifting distribution of debt during the housing boom period of the late 1990s to 2007, drawing on a combination of data from the triennial SCF and the New York Fed’s Equifax-based Consumer Credit Panel. The advantage of the former is that both income variables and balance sheet variables are observed directly at the household level. The advantage of the latter is a much larger sample with more frequent data; the disadvantage is that income is not directly observed but must be inferred from other variables, typically zip code. Their central findings

contradict conventional theories that the mortgage boom was driven by disproportionate borrowing at the lower end of the income distribution. ... Low-income borrowing grew rapidly, with much of this new debt packaged into the subprime mortgage-backed securities that caused so many problems during the 2008 financial crisis. Yet borrowing by high-income individuals rose at similar rates, so the distribution of debt with respect to income remained stable over time. ... Overall, there is no evidence of a relative expansion of mortgage borrowing among low-income or marginal borrowers during the boom. (Foote, Loewenstein, and Willen 2016)

As they note, given the positive relationship between debt and income, an equal proportionate increase in debt across the income distribution means that in absolute terms the largest share of the debt increase was accounted for by the highest-income households. Concretely, the rise in housing prices during the boom period tended to price lower-income households out of the housing market, offsetting the loosening of lending standards. More subtly but critically, they emphasize that gross flows—which many discussions of household borrowing focus on—are not a good guide to changes in stocks (see the discussion in section 2.2). Mian and Sufi (2014) base much of their analysis on the increase in mortgage borrowing by lower-income households (or more precisely, households in lower-income zip codes) during the housing boom. But as Foote, Loewenstein, and Willen (2016) point out, there was a roughly similar rise in home sales and mortgage payoffs in the same zip codes during this period. So the large increase in gross flows into these neighborhoods did not imply a comparable increase in the stock of debt. This is both because increasing home turnover during the boom meant that mortgage payoffs increased as well as new lending, and because even where there are significant net flows, the long duration of most mortgage loans means that even large net flows sustained over several years may have only modest effects on stocks.

The simplest way to look at the distribution of debt by income is through the SCF. As table 4 (based on SCF data) shows, over the whole period household debt has been concentrated in the upper-middle range. More than three-quarters of household debt is owed by the top 40 percent of the income distribution; less than 10 percent is owed by the bottom 40 percent. This is not surprising, when we recall that debt is mainly incurred to finance asset ownership. It is precisely the upper-middle strata that are both likely to own expensive assets and to need to borrow for them. Increasing income inequality means that fewer households are located in this middle part of the distribution, so the most natural result of greater income inequality would be a *reduction* in household debt.

Figure 6: Median Debt-Income Ratios by Income Percentile and Year



Source: SCF (various years) and author's analysis

Table 4: Share of Total Household Debt by Income Decile, Various Years

	1983	1989	1995	2001	2007	2013
bottom	0.01	0.01	0.01	0.01	0.01	0.02
2	0.02	0.01	0.02	0.02	0.02	0.02
3	0.02	0.02	0.04	0.03	0.03	0.03
4	0.04	0.04	0.04	0.04	0.03	0.04
5	0.05	0.06	0.06	0.07	0.06	0.05
6	0.07	0.07	0.08	0.08	0.08	0.08
7	0.09	0.11	0.11	0.10	0.11	0.10
8	0.13	0.15	0.14	0.14	0.16	0.14
9	0.18	0.19	0.19	0.18	0.19	0.19
top	0.38	0.35	0.32	0.33	0.31	0.34

Source: SCF (various years) and author's analysis

Figure 6 shows the median ratio of household debt to income for each of 20 income quantiles, from the lowest-income 5 percent to the highest-income 5 percent, for six selected years between 1983 and 2013. Table 4 shows the share of total household debt accounted for by each income decile for each of the same six years. So, for instance, in 2013 the median debt-income ratio for a household at the 50th income percentile was a bit below 0.5. And in 2013, 34 percent of total household debt was owed by the highest-income decile, while only 2 percent of total debt was owed by each of the two lowest-income deciles.

A few points come out clearly here. First, household debt is mainly found in the upper-middle part of the income distribution. The majority of households in the bottom quintile report no debt, and this has been true of every year in the survey. Median debt ratios in the second quintile from the bottom are also consistently very low. The highest debt ratios are consistently found between the 75th and 90th percentiles. This is the natural result of the point stressed in section 2.1, that debt is incurred to finance asset ownership, not current expenditure. The great majority of household debt (over 90 percent) is incurred to finance home ownership, auto ownership, and postsecondary degrees. Low-income households are unlikely to own homes or attend college or university, especially the more expensive selective private and professional schools. While most low-income households do own vehicles, they are often purchased used, which may not require debt financing. Lack of assets among lower-income households is in part because they cannot get credit for these purchases; perhaps more important, all these purchases also involve significant out-of-pocket costs (down payments and so on), and are linked to a larger set of lifecycle choices that are shaped by class position. So it is not surprising that the highest debt ratios (and the great majority of aggregate debt) are found in the top two quintiles.

Debt ratios do fall somewhat at the very top of the distribution, but the absolute level of debt rises monotonically with income. This distribution is especially striking since the income measured here is current, not lifetime, income. If a major purpose of borrowing was to smooth consumption in the face of short-term variations in income, you would expect to see a large fraction of debt owed by households whose income was currently low. The fact that we do not see this means that either most income variation is persistent rather than transitory, or that households do not use debt for consumption smoothing. Both are probably true. It's also worth noting that even in the 2000s, when debt ratios rose sharply in the middle part of the distribution

(discussed immediately below), the aggregate distribution of debt did not change very much. Even when debt-income ratios are higher in the upper-middle part of the distribution than at the very top, the total quantity of debt owed is still higher at the top.

The fact that debt rises with income, and that there is very little debt in the bottom half of the distribution, is a problem for stories about rising household debt that emphasize *working class* incomes and living standards. It is a less serious problem for stories like Cynamon and Fazzari (2015), which focus on the division between the top few percentiles and the bulk of the population.

The second point that comes out of figure 6 is that there *is* an exceptional increase in debt ratios between 2001 and 2007, between roughly the 50th and the 80th percentiles. During this period, debt-income ratios roughly doubled for these income ranges, with increases ranging from 0.5 to 1.0 at the 50th percentile, up to from 0.75 to 1.5 to the 75th percentile. Unlike the rest of the 1983–2013 period, this six-year stretch saw both a large increase in aggregate household debt and a downward shift in its distribution.

On the face of it, this seems to support a link between borrowing and income distribution, via the housing-finance expansion described in section 2.2. There are some problems, though. First of all, the rise in middle-income debt ratios is limited to the 2001–07 period, even though income inequality has risen steadily since the early 1980s. Second, there was no similar rise in debt ratios in the bottom half of the income distribution. Finally, as discussed in section 3, there was no corresponding increase in aggregate demand from the household sector during this period (Mason and Jayadev 2015).

The natural interpretation of these facts is that the mid-2000s' rise in household debt is not directly linked to income distribution but rather is explained by the housing bubble. Higher mortgage borrowing was both required and enabled by the rise in the prices of existing houses; increased mortgage borrowing in turn sustained the price rise (Mian and Sufi 2011). In some cases, rising home prices may also have allowed households to maintain a higher level of current expenditure. But in the aggregate, there was at most a modest increase in current household expenditure relative to income, and as discussed in the following section, this increase appears to

have come mostly near the top of the income distribution. The housing bubble of the 2000s was certainly shaped by the larger economic context, including the distribution of income. But we should not look for a *direct* link between distribution and rising middle-class debt—the immediate cause was the housing bubble.

The housing bubble was a discrete phenomenon. There was a sharp rise in debt in the middle class (the 50th–90th percentiles.) But this was specifically about mortgage debt. And it was limited to distinct period—the first half of the 2000s. Up to 2001, there was a steady rise in debt ratios across the whole population without any change in the distribution. But from 2001–07, there was a sharp rise centered at the 75th percentile or so that pushed the distribution somewhat downward. This downward shift in the debt distribution was reversed after 2007, in large part due to default (see the last column of table 3). This temporary downward shift in debt was a result of the housing bubble specifically, not a more generic response to changing income distribution. And even during the housing bubble period, very little debt was owed by households in the bottom half of the income distribution.

7. CONSUMPTION INEQUALITY APPEARS TO TRACK INCOME INEQUALITY

A central claim in the debt-distribution-demand story is that lower-income households borrowed in order to maintain their expected standards of consumption, and/or to emulate the consumption of higher-income households. This implies that inequality in consumption should have increased by less than inequality in incomes. This is explicitly acknowledged in many, though not all, arguments linking rising debt to increased inequality. For example, McCombie and Spreafico (2017) claim that “the change in the inequality in consumption was considerably less than the change in income inequality.” They do not provide any reference for this claim, but there is empirical work on this question. While measuring the distribution of consumption presents serious challenges, most of the recent literature concludes that consumption inequality in the US has in fact risen about as much as income inequality.

There are two comprehensive US datasets on household consumption available over a long period. First (available from 1980) is the Consumer Expenditure Survey (CEX), conducted by the Bureau of Labor Statistics (BLS). This survey was developed to help form weights placed on price changes of goods in the computation of the overall Consumer Price Index. The other dataset (available from 1968) is the Panel Study of Income Dynamics (PSID), originally created to study income dynamics across generations. Until 1997, the PSID collected information on only a few consumption items: food, home rent, and utility payments. Starting with the 1999 wave, however, the PSID began to collect information on a larger range of items (Browning, Crossley, and Winter 2014).

A puzzle about consumption as measured in both these surveys is that the implied aggregate consumption level is inconsistent with the aggregate consumption reflected in the national accounts. One important reason for this discrepancy is that the surveys measure a different consumption concept than does the national accounts. Households normally report only cash outlays for consumption goods in the current period as consumption. But as discussed in sections 4 and 5, the definition of household consumption used in the national accounts includes third-party expenditure for healthcare and other purposes, and imputed noncash spending on owned housing, financial services, and other areas (Attanasio and Pistaferri 2016). Other forms of noncash consumption, such as the flow of services provided by consumer durables, are not counted by either survey or in the national accounts, but arguably should be included if the goal is to measure living standards. Since these flows do not involve cash outlays by households, however, they are not relevant for a discussion of household debt. In addition to conceptual issues, it is clear that household reporting of consumption expenditures is less accurate than income reporting, and that the errors are not random, but correlated with income—consumption is disproportionately underreported by higher-income households (Aguiar and Bils 2015). Finally, households do not necessarily face the same prices for consumption goods, so the distribution of consumption across households may be different from the distribution of consumption expenditure (Gordon 2009).

A number of recent papers attempt to overcome these problems and produce consistent measures of the distribution of household consumption and consumption expenditure. Most of these papers have found that changes in the distribution of consumption spending across income

groups have generally tracked changes in the distribution of income. In the remainder of this section, I briefly review some recent examples.

Aguiar and Bils (2015) makes use of CEX interview data from 1980 through 2010. They seek to overcome the limitations of the CEX data by constructing a measure of consumption inequality based on

how richer versus poorer households allocate spending across goods. ... Intuitively, if consumption inequality is increasing substantially over time, then higher income households will shift consumption toward luxuries more dramatically than lower income households. The key advantage of this approach is that it does not require that the overall expenditures of households be well measured. Starting from consistent estimates of a demand system (Engel curves), the ratio of spending across any two goods with different expenditure elasticities identifies the household's total expenditure. (Aguiar and Bils 2015)

In their preferred specification, they find that consumption inequality—measured as the ratio of consumption by the top income quintile to consumption by the bottom income quintile—increased by between 30 and 42 percent over the full period, compared with an increase in the equivalent measure of income inequality of 33 percent. In other words, they find that consumption inequality rose by at least as much as income inequality.

Fisher, Johnson, and Smeeding (2013) also make use of the CEX data. They construct a measure of household consumption that includes all cash outlays classed as consumption except for vehicle purchases and expenditures on owned homes, plus the imputed flow of services from owned homes and vehicles, all adjusted for household size. Measuring inequality by the Gini index, their main finding is that, while income inequality is always greater than consumption inequality, they follow the same trend: “income and consumption inequality increase at approximately the same rate between 1985 and 2006” (Fisher, Johnson, and Smeeding 2013). Again, this contradicts the claim that consumption inequality increased less than income inequality, whether due to borrowing or for some other reason.

Attanasio, Hurst, and Pistaferri (2012) employ a number of strategies to overcome the limitations of the CEX data. In one specification, they limit their analysis to consumption categories where measurement error has been found to be less of an issue. In another, they follow the same approach as Aguiar and Bils (2015) by comparing the spending on luxuries

(entertainment) relative to necessities (food). Third, they use expenditure data from the PSID and the CEX to compare the resulting measures of consumption inequality for the period covered by both. All these approaches yield the same results: “Consumption inequality within the U.S. between 1980 and 2010 has increased by nearly the same amount as income inequality” (Attanasio, Hurst, and Pistaferri 2012). Measuring inequality as the standard deviation of log income and log consumption, they find that income inequality increased by 0.20 percentage points, while consumption increased by between 0.15 and 0.20 points.

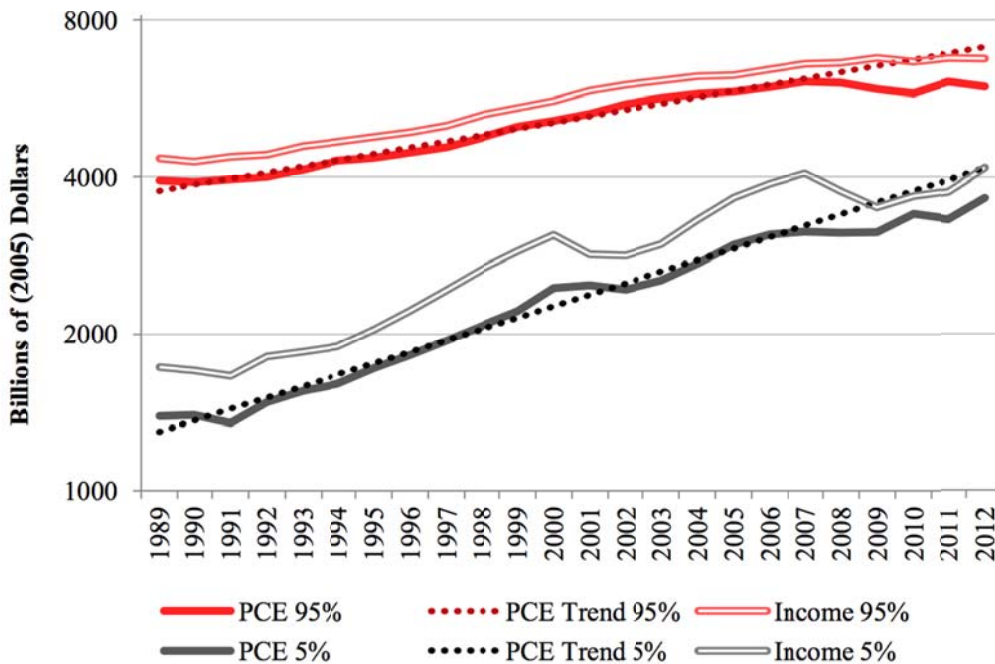
In their text, Cynamon and Fazzari (2015) argue that consumption dynamics in the period before 2007 were driven by rising inequality, as households in the bottom 95 percent of the distribution used credit to raise consumption spending relative to slow-growing income. But the data they present on income and consumption distribution tell a different story. By their measure, the ratio of consumption to income for the bottom 95 percent was essentially flat between 1989 and 2009; consumption rose as a share of income only at the *top* of the distribution—in fact, by the end of the period, for the first time, the consumption ratio of the top 5 percent was higher than that of the bottom 95 percent. This implies that consumption inequality has actually increased *more* than income inequality—exactly the opposite of the prediction implied by the text.¹⁴

In my view, Cynamon and Fazzari (2015) presents the most convincing measurement of consumption across households. Their figure showing the key results is reproduced here as figure 7. Two things are clear from this figure. First, the distribution of consumption between the top 5 percent and bottom 95 percent by income has closely tracked the distribution of income between these two groups. Second, to the extent consumption trends have diverged from income trends, it has been in the direction of higher consumption as a share of income among high-income households, and lower consumption relative to income among lower-income households. If a mechanism is needed to explain rising consumption demand in the face of more unequal income in the period before 2007, it should focus on luxury consumption among the rich—perhaps driven by a wealth effect from capital gains—rather than on debt-financed consumption among the bottom 95 percent. As discussed in section 4, it is not clear how much we need to

¹⁴ In the paper, Cynamon and Fazzari (2015) merely observe in passing that the flat consumption share of the bottom 95 percent is “perhaps somewhat surprising.” In personal correspondence, they acknowledge the fundamental problem it creates for their larger argument.

postulate any such mechanism: When measured consistently as money expenditure by households, there does not appear to have been any rise in aggregate consumption spending as a share of income since 1980. Still, given that consumption propensities do generally fall with income, the combination of rising income inequality with even a constant aggregate consumption-income ratio needs an explanation. An increasing fraction of high incomes being spent on luxury consumption is a plausible candidate.

Figure 7: Consumption and Income for the Top 5 Percent and Bottom 95 Percent, 1989–2012



Source: Cynamon and Fazzari (2015)

Among the few recent studies of US consumption inequality to find that it has increased significantly less than income inequality is Meyer and Sullivan (2013). They report a number of alternative measures of both consumption and income inequality, but by most of them the increase in consumption inequality since 1980 has been much less than the increase in income inequality, especially in the later part of this period. Since 2000, they find there has been no increase in consumption inequality at all (Meyer and Sullivan 2013). It's beyond the scope of this paper to evaluate these competing claims, or explain why this work finds such different results from other studies of income and consumption distribution. Suffice to say that Meyer and Sullivan (2013) seems to be an outlier among these studies.

Compared with the issues discussed in the other sections of this paper, the data on consumption inequality is not straightforward to interpret, and the conclusions of this section should be taken as more tentative than the others. But certainly the bulk of the empirical literature suggests that consumption inequality rose no less than income inequality between the 1980s and 2007.

A final note: The alternative to the view that income inequality has led to an increase in borrowing among lower-income households is that income inequality has led to a decline in living standards among lower-income households. As people get poorer, they don't borrow more, they buy less. This decline in living standards among lower-income households is reflected in many indicators of health and wellbeing, such as falling life expectancies (Case and Deaton 2015). It is strange that many writers who are critical of the increasing inequality of American income distribution implicitly deny that rising inequality has led to falling living standards for poor and working-class households.

8. CONCLUSIONS

A widespread assumption (usually implicit) in discussions of macroeconomic dynamics in the period before 2007 is that the increase in household debt-income ratios reflected increased household borrowing, which in turn reflected increased household consumption spending (indeed, these three terms are often treated as equivalent). This paper is intended to challenge this view—not necessarily to refute it, but to suggest that a more careful look at the larger macroeconomic picture does not fit these stories as well as is sometimes assumed.

In sections 2 through 7, I have made the following claims:

- The great majority of household debt is incurred to finance asset positions, not current consumption.
- Historically, changes in household debt-income ratios have been driven more by variation in nominal income growth and interest on existing debt than by new borrowing.
- Household debt is concentrated near the top of the income distribution; very little is owed by lower-income households.

- Consumption inequality appears to have increased in line with income inequality.
- The apparent rise in household consumption relative to income is entirely the result of third-party and imputed noncash expenditure; cash outlays for consumption by households are no higher as a share of income than they were in 1980.
- In general, changes in household balance sheets are not closely linked to changes in consumption spending.

Each of these claims creates challenges for a story in which debt-income ratios rose due to increased borrowing to finance consumption that was required to maintain living standards in the face of greater inequality. The seriousness of these challenges depends to some extent on the exact domain the story is understood to apply to. The debt-distribution-demand story is most plausible if it is limited to the 2000s housing boom, and to the top third of the income distribution. It is not plausible if applied to the long-term rise in debt, or to the income distribution as a whole. During 2002–07, there was a substantial increase in borrowing by households. About half of these increased inflows financed housing investment; the remainder—annual flows of around 2 percent of GDP—was potentially available to finance higher consumption. And this period did see a significant downward shift in the distribution of debt by income—not to the bottom half, which has never held significant debt, but from roughly the 95th to the 75th income percentile.

It is important to note that the increase in household borrowing during the housing boom period was more than reversed during the following years; the fact that household debt-income ratios were substantially higher in 2016 than in 1980 owes nothing to the housing boom. And while it is possible—though hardly certain—that households at the 70th or 80th income percentile would have borrowed less during this period if their incomes had been higher, it is nearly certain that, in the absence of other institutional changes, a redistribution of income toward the bottom half would result in more household debt, not less, as debt-financed home ownership and higher education, currently inaccessible for most of these households, came into reach.

On the positive side, critically investigating the premises of the debt-distribution-demand story helps clarify the actual historical trajectory of household balance sheets. Future work in this area, I suggest, would benefit from two methodological strictures. First, when balance sheet

variables like debt are the object of inquiry, we need to take a consistent “accounting view” of the economy (Bezemer 2016). We cannot analyze balance sheet variables as if they simply recorded income and expenditure flows. As a corollary to this, we should keep in mind that debt is used mainly to finance assets; consumption loans are much more important in orthodox theory than in the real world. Second, we need to be careful about mapping variables as reported in the national accounts onto the equivalent variables in theory. This concern is as old as empirical economics, but it is too often ignored in practice.¹⁵ The differences between the definition of the reported variables and the definition required by theory cannot be assumed to be of second-order importance. The national accounts are constructed on the basis of an uneasy, sometimes unstable, compromise between economic theory (itself of different vintages), private accounting practices, and administrative convenience. We must be very cautious in assuming that the values in the national accounts labeled “consumption,” “saving,” and so on correspond to either the equivalent terms in our theoretical models or to the common-sense uses of those terms in everyday life.

With respect to the long-term rise in household debt: This is a monetary phenomenon. Fundamentally, it is the result of higher interest rates and lower real income growth and inflation. On the other side of the equation, increasing income inequality has simply led to an increase in private consumption inequality. To the extent that consumption demand has been stronger than would be predicted by a Keynesian story of consumption propensities declining with income, the explanations appear to be a mix of increased luxury consumption by high-income households and increased social spending classified as household consumption in the national accounts. Income inequality may indeed have contributed to weaker aggregate demand. But so may a number of other factors affecting desired consumption and investment, including: the progressive satiation of consumption demand; slowing population growth; increasing monopoly power; the shift from manufacturing to less capital-intensive services; changes in the fraction of profits retained in the business sector; the trade deficit; and increased longevity of capital goods. The possible influences of all these factors, along with countervailing forces

¹⁵ “There is hardly an economist who feels really happy about identifying the current series of ‘national income,’ ‘consumptions,’ etc. with the variables by those names in his theories. Or, conversely, he would often think it too complicated or perhaps even uninteresting to try to build models... [that] would correspond to the variables actually given by current economic statistics” (Haavelmo 1944).

tending to raise aggregate demand, need to be investigated systematically; we should not immediately focus on one possible story to the exclusion of the others.

Politically, the conclusion suggested by this paper is that the problem of debt is *not* that it substitutes for rising wages. It is, first, that security and social status depend on asset ownership. Debt-financed home ownership, for instance, substitutes for strong tenant protections that would make renting a more viable alternative. An example of this is Germany, which has both the lowest levels of household debt *and* the lowest levels of household wealth in the euro area (European Central Bank 2013). One major reason for this is that strong tenant protections make homeownership less necessary for middle-class German households.

Second, the monetary system has operated in such a way as to inflate the value of existing financial claims. In particular, the distributional impacts of monetary policy—in the US context, the Volcker shock in particular—need to take a central place in any historical account of the rise in household debt.

If the rise in household debt is a problem, the solution is unlikely to lie with a more equal distribution of income, attractive as that may be for other reasons. Rather, it is one or both of these two conditions that needs to be changed.

REFERENCES

- Abbas, S. M. Ali, Nazim Belhocine, Asmaa ElGanainy, and Mark Horton. 2011. “Historical Patterns of Public Debt: Evidence from a New Database.” International Monetary Fund Working Paper. Washington, DC: International Monetary Fund. Available at: <http://www.imf.org/external/np/seminars/eng/2010/eui/pdf/AB.pdf>.
- Aguiar, Mark, and Mark Bilal. 2015. “Has Consumption Inequality Mirrored Income Inequality?” *The American Economic Review* 105(9): 2725–56.
- Aizenman, Joshua, and Nancy Marion. 2009. “Using Inflation to Erode the U.S. Public Debt.” NBER Working Papers 15562. Cambridge, MA: National Bureau of Economic Research.
- Attanasio, Orazio P, and Luigi Pistaferri. 2016. “Consumption Inequality.” *The Journal of Economic Perspectives* 30(2): 3–28.
- Attanasio, Orazio, Erik Hurst, and Luigi Pistaferri. 2012. “The Evolution of Income, Consumption, and Leisure Inequality in the US, 1980–2010.” NBER Working Paper 17982. Cambridge, MA: National Bureau of Economic Research.
- Bezemer, Dirk J. 2016. “Towards an Accounting view On Money, Banking and the Macroeconomy: History, Empirics, Theory.” *Cambridge Journal of Economics* 40(5): 1275–95.
- Brown, Meta, Andrew Haughwout, Donghoon Lee, and Wilbert Van Der Klaauw. 2013. “The Financial Crisis at the Kitchen Table: Trends in Household Debt and Credit.” *Federal Reserve Bank of New York Staff Report* 19(2): 1–10.
- Browning, Martin, Thomas F. Crossley, and Joachim Winter. 2014. “The Measurement of Household Consumption Expenditures.” *Annual Review of Economics* 6(1): 475–501.
- Case, Anne, and Angus Deaton. 2015. “Rising Morbidity and Mortality in Midlife among White Non-Hispanic Americans in the 21st Century.” *Proceedings of the National Academy of Sciences* 112(49): 15078–83.
- Cynamon, Barry Z., and Steven M. Fazzari. 2017. “Household Income, Demand, and Saving: Deriving Macro Data with Micro Data Concepts.” *Review of Income and Wealth* 63(1): 53–69.
- . 2015. “Inequality, the Great Recession and Slow Recovery.” *Cambridge Journal of Economics* 40(2): 373–99.
- European Central Bank. 2013. “The Eurosystem Household Finance and Consumption Survey: Results from the First Wave.” ECB Statistics Paper Series 2. Frankfurt am Main: European Central Bank.

- Fisher, Irving. 1933. "The Debt-Deflation Theory of Great Depressions." *Econometrica* 1(4): 337–57.
- Fisher, Jonathan D., David S. Johnson, and Timothy M. Smeeding. 2013. "Measuring the Trends in Inequality of Individuals and Families: Income and Consumption." *The American Economic Review* 103(3): 184–88.
- Foote, Christopher L., Lara Loewenstein, and Paul S. Willen. 2016. "Cross-Sectional Patterns of Mortgage Debt During the Housing Boom: Evidence and Implications." Federal Reserve Bank of Boston Working Paper 16-12. Boston: Federal Reserve Bank of Boston.
- Gordon, Robert J. 2009. "Misperceptions about the Magnitude and Timing of Changes in American Income Inequality." NBER Working Paper 15351. Cambridge, MA: National Bureau of Economic Research.
- Haavelmo, Trygve. 1944. "The Probability Approach in Econometrics." *Econometrica* 12(Supplement): 1–115.
- Hall, George J., and Thomas Sargent. 2011. "Interest Rate Risk and Other Determinants of Post-WWII US Government Debt/GDP Dynamics." *American Economic Journal: Macroeconomics* 3(3): 192–214.
- Haughwout, Andrew, Donghoon Lee, Joelle Scally, and Wilbert van der Klaauw. 2014. "Household Debt Balances Increase as Deleveraging Period Concludes." Federal Reserve Bank of New York, Liberty Street Economics Blog, November 25.
- Hockett, Robert C., and Daniel Alpert. 2016. "The Debt Goes on: A Post-Crisis 'Progress' Report." Cornell Legal Studies Research Paper 16-36. Ithaca, NY: Cornell University Law School.
- Knibbe, Merijn. 2014. "The Growth of Capital: Piketty, Harrod-Domar, Solow and the Long Run Development of the Rate of Investment." *Real-World Economics Review* 69(October): 100–16.
- Mason, J. W., and Arjun Jayadev. 2015. "The Post-1980 Debt Disinflation: An Exercise in Historical Accounting." *Review of Keynesian Economics* 3 (3): 314–35.
- . 2014. "Fisher Dynamics in US Household Debt, 1929–2011." *American Economic Journal: Macroeconomics* 6(3): 214–34.
- Mason, J. W., Arjun Jayadev, and Amanda Page-Hoongrajok. 2017. "The Dynamics of State and Local Debt." WCEG Working Paper. Washington, DC: Washington Center for Equitable Growth.
- McCombie, John, and Marta Spreafico. 2017. "On Income Inequality: The 2008 Great Recession and Long-Term Growth." In Mauro Magatti (ed.), *The Crisis Conundrum*. Berlin: Springer.

- Mehrling, Perry. 2014. "MIT and Money." *History of Political Economy* 46(suppl 1): 177–97.
- Meyer, Bruce D., and James X. Sullivan. 2013. "Consumption and Income Inequality and the Great Recession." *The American Economic Review* 103(3): 178–83.
- Mian, Atif, and Amir Sufi. 2014. *House of Debt: How They (and You) Caused the Great Recession, and How We Can Prevent It from Happening Again*. Chicago: University of Chicago Press.
- . 2011. "House Prices, Home Equity–Based Borrowing, and the US Household Leverage Crisis." *The American Economic Review* 101(5): 2132–56.
- Naidu, Suresh. 2017. "A Political Economy View of K/W." In Heather Boushey, Bradford DeLong, and Marshall Steinbaum (eds.), *After Piketty: The Agenda for Economics and Inequality*. Cambridge, MA: Harvard University Press.
- Samuelson, Paul A. 1958. "An Exact Consumption-Loan Model of Interest with or without the Social Contrivance of Money." *Journal of Political Economy* 66(6): 467–82.
- van Treeck, Till. 2014. "Did Inequality Cause the US Financial Crisis?" *Journal of Economic Surveys* 28(3): 421–48.