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The post-1980 debt disinflation: an exercise in historical accounting

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The conventional division of household payment flows between consumption and saving is not suitable for investigating either the causes of changing household debt–income ratios, or the interaction of household debt with aggregate demand. To explain changes in household debt, it is necessary to use an accounting framework that isolates net credit-market flows to the household sector, and that takes account of changes in the debt–income ratio resulting from nominal income growth as well as from new borrowing. To understand the implications of changing household income and expenditure flows for aggregate demand, it is necessary to distinguish expenditures that contribute to demand from expenditures that do not. Applying a conceptually appropriate accounting framework to the historical data reveals that the rise in household leverage over the past 3 decades cannot be understood in terms of increased household borrowing. For both the decade of the 1980s and the full post-1980 period, rising household debt–income ratios are entirely explained by the rise in nominal interest rates relative to nominal income growth. The rise in household debt after 1980 is best thought of as a debt disinflation, analogous to the debt deflation of the 1930s.

Keywords: *household debt, debt dynamics, deleveraging, disinflation, interest rates, accounting*

JEL codes: *D14, E21, E31, E43, H63, N32*

1 INTRODUCTION

Between 1929 and 1932, US household leverage – measured as the ratio of household debt to gross domestic product – grew by 10 percentage points. This growth was entirely due to falling prices and incomes; new borrowing by households fell sharply during this period. Irving Fisher famously identified the rise in the real burden of debt through deflation as central to the macroeconomics of the Depression (Fisher 1933).

While debt–income ratios were roughly stable for the household sector in the 1960s and 1970s, they rose sharply starting in the early 1980s. The rise in household leverage after 1980 is normally explained in terms of higher household borrowing. But increased household borrowing cannot explain the rise in household debt after

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1980, as the net flow of funds to households through the credit markets was substantially lower in this period than in earlier postwar decades. During the housing boom period of 2000–2007, there was indeed a large increase in household borrowing. But this is not the case for the earlier rise in household leverage in 1983–1990, when the debt–income ratios rose by 20 points despite a sharp fall in new borrowing by households.

For both the 1980s episode of rising leverage and for the post-1980 period as a whole, the entire rise in debt–income ratios is explained by the rise in nominal interest rates relative to nominal income growth. Unlike the debt deflation of the 1930s, this 'debt disinflation' has received little attention from economists or in policy discussions.

Section 2 of this paper discusses alternative accounting frameworks for describing the evolution of household balance sheets. The remainder of the paper then makes two interconnected contributions. In Section 3, we adapt a standard decomposition method utilized in the public finance literature to analyse the contributions of interest rates, inflation, and growth to changes in leverage, as distinct from the contribution of new borrowing. By quantifying the contribution of each of these factors, as well as defaults, to annual change in debt–income ratios, we are able to give a complete decomposition of changes in the household debt–income ratio over time – something that, to our knowledge, has not previously been done. Then, in Section 4, we distinguish household spending on currently produced goods and services from other household expenditure flows, in order to examine the relationship between household borrowing and aggregate demand. We show that there is not, in general, a systematic relationship between changes in household debt–income ratios and aggregate demand. Over the past 80 years, household borrowing and the household sector's contribution to aggregate demand sometimes have moved together, but often have not.

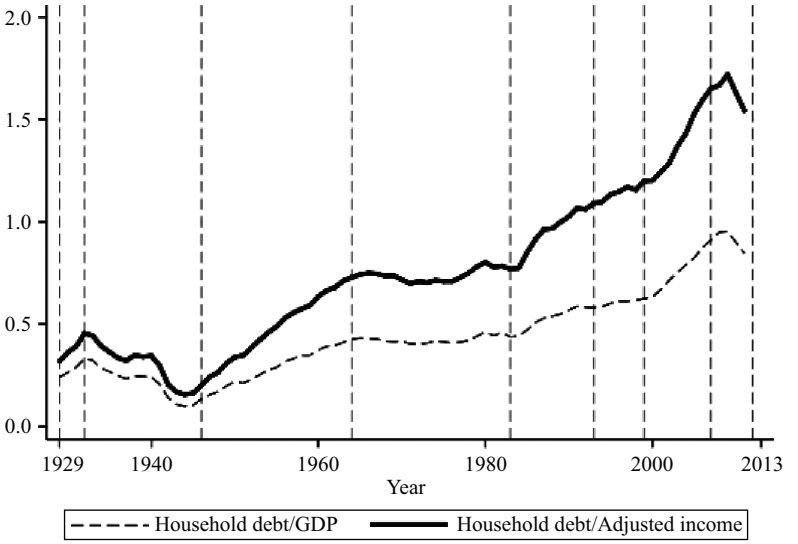
Section 5 concludes. In this section, we suggest that if lower household leverage is desired, the supply of and demand for household credit is a second-order issue. The central factor in the long-term evolution of leverage is the relationship between nominal interest rates, inflation, and income growth.

1.1 Accounting and history

In examining leverage trends, one is often concerned with the ratio of outstanding debt to some measure of the capacity to repay debt. For households, this measure is typically income. During the 1960s and 1970s, the ratio of debt to income for the US household sector was roughly constant.[1] In 1983, the ratio stood at around 75 percent, the same as 20 years earlier. Then, between 1983 and 2008, the ratio doubled, to over 160 percent (see Figure 1). Why did household leverage rise so sharply after 1983, after being stable for the previous 20 years? And what were the macroeconomic implications of this rise in household debt ratios? Did the rise in household debt help sustain aggregate demand, in the face of other factors that tended to hold down demand after 1980?

Any attempt to answer these questions using macroeconomic data must use an appropriate accounting framework. It is normal to discuss both the evolution of household debt and aggregate demand in terms of household savings behavior. The savings concept in national accounts, however, is not appropriate for either of those purposes. Savings in the national accounts include all spending that is not directed toward current consumption, with mortgage interest payments included in consumption.

1. This is true whether one uses the conventional measure of household income or the alternative measure of household income described in the following section.



Notes: The lines show the gross nominal debt of the household sectors relative to nominal GDP and adjusted nominal income. Nominal income is adjusted to include only cash payments received by households, following Cynamon and Fazzari (2014). Vertical dashed lines correspond to the periodization used in the text and tables.

Figure 1 Household leverage, 1929–2011

Dissaving in this concept does not correspond to credit-market borrowing. While it is natural to suppose that the rise in household debt after 1980 is connected with the similarly timed fall in personal savings, in fact there is no direct connection between the two trends.

2 ACCOUNTING FOR HOUSEHOLD EXPENDITURE

There are four steps that must be taken to produce an accounting framework suitable for addressing questions about the evolution of household debt. First, they must be put on a cash-flow basis, removing all imputed non-market transactions – for instance, the value of services from owner-occupied housing. We must also remove transactions between third parties that are conventionally assigned to the household sector but do not involve any payments to or from households, such as employer purchases of health insurance. Second, income and expenditure flows must be classified in a way that separates cash flows to and from the credit markets from non-credit transactions. Third, expenditures that contribute to demand for currently produced goods and services must be distinguished from expenditures that do not. Fourth, the evolution of the numerator and the denominator of the debt–income ratio must be described consistently within the same framework.

Household expenditures are, with a few variations, classified in broadly the same ways in most modern national accounting systems. Taxes on income are first distinguished as their own category as a deduction from income, and the remaining expenditure flows ('disposable income') are divided into 'consumption' and 'saving.' Net acquisition of

financial assets is grouped in saving, while interest payments and expenditure on services and non-durable goods is grouped with consumption.[2] There is some variation in the treatment of net acquisition of durable goods.

Some statistical agencies, including the US Bureau of Economic Affairs (BEA) in the National Income and Product Accounts (NIPAs), group expenditure flows associated with net acquisition of housing as saving, and flows of expenditure devoted to other durable goods as consumption. Other statistical agencies, such as the US Federal Reserve in its financial accounts, group all expenditure on durable goods as savings. Net acquisition of financial assets is not tracked in the national income and product accounts, which are supposed to cover only market transactions in final goods and services.

Because they separate expenditure flows that respond to current household requirements from flows that are presumed to be oriented toward future needs, the standard conventions are appropriate for discussions of investment in terms of output reserved from current requirements. For other kinds of questions they may be unclear or misleading. In particular, neither of the standard conventions is well-suited to discussions of changes in leverage and aggregate demand, as the standard definition of borrowing includes both credit market and non-credit market transactions, and the standard definition of consumption does not correspond with household expenditures on currently produced goods and services.

A discussion of debt in relation to household income and expenditure must treat these latter categories on a consistent flow of funds or cash-flow basis. This is because debt is incurred as a result of a divergence between cash income and cash outgoings, and because debt must be serviced out of cash income. Changes in non-market flows or third-party payments do not 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, as employer pension contributions have no direct effect on current household cashflows.

To exclude imputed non-cash transactions and transactions that do not involve payments to or from households, and to distinguish expenditures that contribute to demand from those that do not, we follow the approach proposed by Cynamon and Fazzari (2014). For 1948–2011, we use their data; for 1929–1947, we adjust the official series on household income and expenditure using the same procedure described in their paper. The changes proposed by Cynamon and Fazzari convert the household income and expenditure series in the national accounts to a consistent cashflow basis by: eliminating the various imputations for non-market goods and services; grouping all household interest payments with transfers rather than with consumption; separating non-profit institutions from the household sector; and attributing third-party payments for medical and pension benefits to the payer's sector rather than to the household sector. We follow them in our adjustment of household income and definition of demand expenditures. We then combine their series with household interest

2. Strictly speaking, the NIPAs group only mortgage interest payments with consumption, as they add to the imputed rental payments on owner-occupied housing. Non-mortgage interest payments are counted in a separate category. But mortgage interest is by far the largest part of household interest payments. And all interest payments are counted as reducing saving, just as consumption does.

payments, from the NIPAs, the change in household debt, from the financial accounts, and the default rate on household debt, from the sources described in Section 3. This allows us to calculate the primary balance for the household sector.

In order to classify household payment flows in a way that is suitable for answering questions about household debt, we propose two alternative conventions. In our first convention – which we term the 'Fisher Dynamics' convention – we subtract interest payments from the increase in household credit market liabilities to get new borrowing by households; the negative of this is the household primary balance. Household primary expenditure is the residual term; as disposable income adjusted for non-cash imputations plus the increase in credit-market liabilities captures all cash incomings, primary expenditure by definition includes all non-interest cash outgoings. In our second alternative convention, we follow Cynamon and Fazzari in identifying household expenditures that contribute to demand for currently produced goods and services. Observed borrowing plus their category of financial saving yields a residual category of non-demand expenditure.

The logic of the Fisher dynamics convention is analogous to the logic of the similar convention for governments. In the absence of access to credit markets, both borrowing and interest payments would be zero. So primary expenditure in our sense would always be equal to income, and the primary balance would be zero. Deviations of the primary balance from zero therefore show the net effect of credit markets on household expenditure. Equivalently, the primary deficit – that is, borrowing less interest payments – represents the net flow of funds to households through the credit markets. The logic of our second convention is that total expenditure by households must be equal to total receipts – including income, borrowing, and sale of assets – and that expenditure can be divided between flows that do and do not fall on currently produced goods and services.

All financial accounts begin with the following identity, which must hold for all economic units:

$$\text{total cash inflows} = \text{total cash outflows}. \tag{1}$$

Cash inflows can be divided into current income and receipts from borrowing, while cash outflows include taxes, purchases of services, durable goods and nondurable goods, residential investment, interest payments, and transfers (which refers to any expenditure that is not made on final output). Households both receive income from the sale of financial assets and make payments to purchase financial assets, but these two sets of payments are combined into net acquisition of financial assets (NAFA) in the financial accounts, so we have to include them either as income or expenditure. We include them as expenditure. This gives us:

$$\text{total cash inflows} = \text{current income} + \text{borrowing} \tag{2}$$

$$\begin{aligned}\text{total cash outflows} = {} & \text{taxes} + \text{services} + \text{durable goods} + \text{non}-\text{durable goods} + \\ & \text{residential investment} + \text{interest} + \text{transfers} + \text{NAFA},\end{aligned} \tag{3}$$

so from 1, 2, and 3:

$$\begin{aligned}\text{current income} + \text{borrowing} = {} & \text{taxes} + \text{services} + \text{durable goods} + \text{non}-\text{durable goods} + \\ & \text{residential investment} + \text{interest} + \text{transfers} + \text{NAFA}.\end{aligned} \tag{4}$$

Following standard practice, we treat taxes as a deduction from income and subtract them from current income to get disposable income. For the moment, we will group all remaining items except taxes on the right-hand side of (4) as 'expenditure.'

The official financial accounts do not observe borrowing directly, but measure it as the change in the debt stock. Thus defaults show up in the accounts as lower observed borrowing. To get the true level of borrowing by households, we must add the total debt charged off due to defaults to the change in debt. Thus we have:

$$\begin{aligned}(\text{current income} - \text{taxes}) \; + \; (\text{debt change} + \text{defaults}) \\ = \text{disposable income} + \text{borrowing}.\end{aligned} \tag{5}$$

Then, combining (4) and (5) gives us:

$$\text{disposable income} + \text{borrowing} = \text{expenditure}. \tag{6}$$

Our two conventions vary in how they divide up the right-hand side of equation (6). For our first convention, we separate out interest payments and call the residual 'primary expenditure.' This is to undertake the analysis of what we call Fisher Dynamics, and assess the contribution of deficits and interest to changes in leverage. So we have:

$$\text{disposable income} + \text{borrowing} = \text{primary expenditure} + \text{interest}. \tag{7}$$

We call the difference between primary expenditure and disposable income the primary balance. The primary balance is the difference between the unit's total cash outgoings and the outgoings it would have in the absence of access to credit markets. This gives us:

$$\text{debt change} = \text{primary balance} + \text{interest} - \text{defaults} \tag{8}$$

or equivalently

$$\text{debt change} = \text{primary expenditure} - \text{income} + \text{interest} - \text{defaults}. \tag{8'}$$

This identity is the starting point for the analysis of Fisher Dynamics in the following section.

For our second convention, we instead divide expenditure on the basis of whether it does or does not fall on currently produced goods and services. Demand expenditure includes residential investment and that part of consumption that reflects market purchases of currently produced goods and services. Non-demand expenditure then consists of interest payments, transfer payments, and net acquisition of financial assets. So we have:

$$\begin{aligned}\text{disposable income} + \text{borrowing} = \text{demand expenditure} \\ + (\text{interest} + \text{transfers} + \text{NAFA}).\end{aligned} \tag{9}$$

The purpose of this decomposition is to isolate those expenditures that contribute to aggregate demand, and show how they behave in relation to the unit's financial position. For simplicity, we combine transfers and net acquisition of financial assets into a single category, which we treat as a balancing item.

The issues are summarized in Table 1. Columns 2 and 3 show the current standard conventions used in the NIPAs and financial accounts. Column 4 shows the convention proposed by Cynamon and Fazzari. The final two columns show our two

Table 1 Alternative accounting treatments of household expenditure

Flow	Financial accounts	NIPAs	C & F	M & J 1	M & J 2
Income taxes	Deduction from income				
Services and non-durable goods	Consumption			Primary expenditure	Demand expenditure
Durable goods	Saving	Consumption		Primary expenditure	Demand expenditure
Residential investment	Saving		Household investment	Primary expenditure	Demand expenditure
Mortgage interest	Consumption		Transfers	Interest	Non-demand expenditure
Personal interest	Transfers			Interest	Non-demand expenditure
Transfers	Transfers			Primary expenditure	Non-demand expenditure
NAFA	Saving	n/a	Financial saving	Primary expenditure	Non-demand expenditure

alternative proposed conventions. Our first convention, we argue, is appropriate for analysing the evolution of household debt over time. The second convention is appropriate for questions about aggregate demand.

3 'FISHER DYNAMICS' IN US HOUSEHOLD DEBT

This section follows Mason and Jayadev (2014) in combining equation (8) with inflation and real income growth to give a systematic accounting of changes in household debt–income ratios over time. This approach is standard for public debt but not normally applied to private debt. Our approach focuses attention on the fact that the evolution of the ratio depends not only on household borrowing, but on real income growth and inflation.[3] Faster growth of nominal income – whether due to real income growth or inflation – reduces the debt–income ratio, just as much as lower borrowing does. This fact is visible in episodes of deflation but is just as true in periods of positive inflation, when it is more often overlooked.

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

$$b_{t+1} = d_t + [(1+i)/(1+g+\pi)]\, b_t + sfa_t$$

so

$$\Delta b = b_{t+1} - b_t = d_t + [(i-g-\pi)/(1+g+\pi)]\, b_t + sfa_t, \qquad (10)$$

3. It is common to speak about changes in borrowing and changes in debt–income ratios as if they were synonyms. For example, compare the title and first sentence of Dynan and Kohn (2009).

where b is the ratio of gross debt to income, Δb is the change in this ratio, d is the ratio of new borrowing – that is, the primary deficit or deficit net of interest payments – to income, i is the effective nominal interest rate, g is the real growth rate of GDP, and π is the inflation rate. sfa_t is the stock-flow adjustment term and captures any difference in debt stocks that cannot be attributed to either interest payments or new borrowing. In this paper, we treat the primary balance as a residual, so there is no possibility of discrepancies of this kind. Instead, the *sfa* term captures the change in debt due to defaults or chargeoffs.

In order to separate out the contributions of the variables, we use a linear approximation of the equation to assess the impacts of each 'Fisher variable' and net borrowing.

$$\Delta b_t \approx d_t + (i_t - g_t - \pi_t - c_t) b_{t-1}. \tag{11}$$

Here c_t is the fraction of debt charged off due to default.

3.1 Data and variable definitions

Except where otherwise noted, data used for the decompositions are drawn from the National Income and Product Accounts and their predecessor series. Our adjusted household income and demand expenditure series are taken from Cynamon and Fazzari (2014) for 1948–2011. For 1929–1947, we construct an adjusted household income measure using the same procedures. The specific adjustments can be found in their table 1. The variables are defined as follows.

Income

Our measure of income includes only cash payments received by households, after taxes; it excludes both imputed non-cash income, and payments on behalf of households made by third parties. This income measure is referred to below as adjusted personal income.

Debt

The stock variable b is the end-of-period value of total credit market liabilities, divided by adjusted personal income.

Borrowing

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. This means that without our correction, defaults show up as lower net borrowing.

Primary balance

The household primary deficit d is calculated as borrowing minus interest payments, divided by adjusted personal income. This is equivalent to the way the primary deficit is calculated for governments.

Demand expenditure

This includes consumption less imputed non-cash expenditures and less payments on behalf of households by third parties, plus residential investment in owner-occupied housing.

Interest rates

Interest payments are gross interest paid by households. 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 and inflation rates

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.[4]

Defaults

For 1999–2012, the annual quantity of debt charged off by default is taken from the New York Fed's Consumer Credit Panel, which gives the conceptually correct measure, gross chargeoffs observed at the household level. For 1985–1998, chargeoffs are taken from net chargeoffs of consumption loans and mortgages on single-family dwellings. For 1935–1984, chargeoffs are based on gross chargeoff rates for all debt held by commercial banks, as reported to the FDIC.

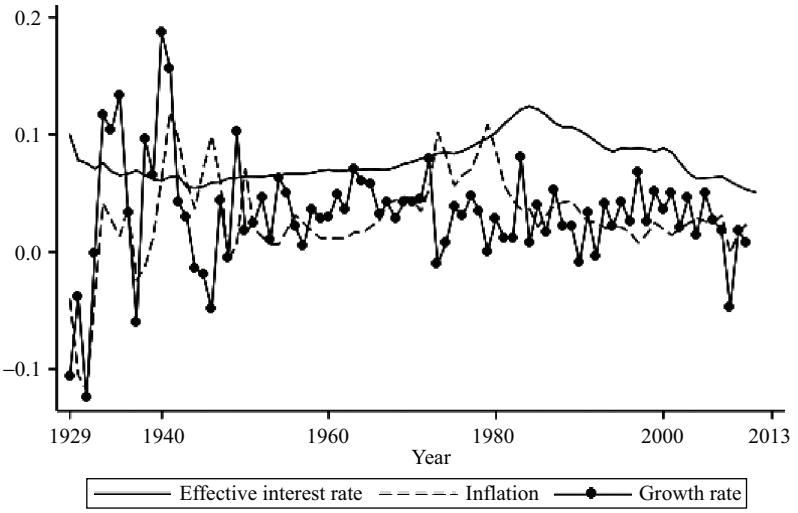
Figure 2 and Table 2 show the behavior of the three 'Fisher variables' over the whole 1929–2011 period.

For the evolution of debt ratios, the most important question is whether nominal interest rates are greater or less than the sum of real growth and inflation. The higher are nominal interest rates compared with nominal growth rates (or, equivalently, real interest rates compared with real growth rates), the greater will be the increase in debt ratios for a given level of new borrowing. When interest rates exceed growth rates, a primary balance of zero will imply rising leverage, however when growth rates exceed interest rates, a primary balance of zero will imply falling leverage. Over the full 1929–2011 period, the two cases ($i > g + \pi$ and $i < g + \pi$) are about equally common.

3.2 Accounting for defaults

An important difference between private and public sector debt dynamics is that for public debt, defaults are discrete, rare events. By contrast lenders write off some

4. Conceptually, the ideal inflation measure would reflect the change in household income attributable to inflation. The PCE or CPI is appropriate for this purpose if we think that wages are set in real terms, but over short periods this may be a misleading assumption; the GDP deflator or an index of unit labor costs might be more appropriate. Fortunately, the various indexes move broadly together,and our results are not qualitatively affected.



Notes: The lines show the behavior of the three Fisher variables since 1929. Adjusted income is calculated as described in the text; nominal income growth is the sum of real income growth and inflation. The effective interest rate is total household interest payments divided by the start-of-period stock of household debt. When the effective interest rate exceeds nominal income growth, a household primary balance of zero implies rising leverage; when nominal growth exceeds the effective interest rate, a primary balance of zero implies falling leverage.

Figure 2 Evolution of effective interest rates, growth and inflation

fraction of private debt every year. So a full accounting of changes in private debt must explicitly include the share of debt written off each year through default. Unfortunately, there does not exist a good series for defaults covering our full period. The financial accounts produced by the Fed do not record defaults; as net borrowing is computed from the change in debt stock, defaults appear as reduced borrowing. Our series for household borrowing and primary deficits are corrected for this bias, as described below.

A number of data sources do allow for estimates of the fraction of household debt written off in recent periods. Since 1999, the New York Federal Reserve's Consumer

Table 2 Average values of the 'Fisher variables' by period, 1929–2011

Period	i	g	π
1929 to 1932	8.1	–6.8	–7.6
1933 to 1945	6.4	6.7	4.1
1946 to 1963	6.6	3.2	2.4
1964 to 1983	8.7	3.5	5.6
1984 to 1993	10.7	2.2	3.2
1994 to 1999	8.7	3.9	1.8
2000 to 2007	7.1	3.3	2.4
2008 to 2011	5.5	–0.7	1.3

Notes: This shows the average values of the effective interest rates faced by households, the growth rate of adjusted household income, and inflation for each of our eight periods. See text for details on variable definitions.

Credit Panel (CCP) has tracked household credit flows, including defaults directly (Lee and van der Klaauw 2010). To our knowledge, this is the only source that captures the full universe of household debt chargeoffs; importantly, it measures gross rather than net chargeoffs. (Gross is the right measure for our purposes as recoveries do not affect the liability side of household balance sheets.) While chargeoffs are measured in the underlying panel data, they are not reported in the main publication based on the CCP, the Quarterly Report on Consumer Credit and Debt. We have constructed our default series by combining the Quarterly Report on Consumer Credit and Debt with the default data reported in Haughwout et al. (2013). For 1999–2012, this is our measure of the change in household debt attributable to default.

For 1985–1998, we construct a default measure based on the Federal Reserve's measure of commercial bank default losses on credit card debt, other consumer loans, and residential mortgages on 1–4 family homes. We take a weighted average of these default rates, with each year's distribution of household debt across these categories as weights. The measure includes only default losses at commercial banks and the default experience of debt held by commercial banks may be different from that of other household debts, especially in periods where a large fraction of household debt is securitized. Also the chargeoffs reported in this series are net of recoveries, which biases the series downwards, but by a negligible amount (when both measures are available, the commercial bank measure averages about 0.5 percentage points below the CCP measure).

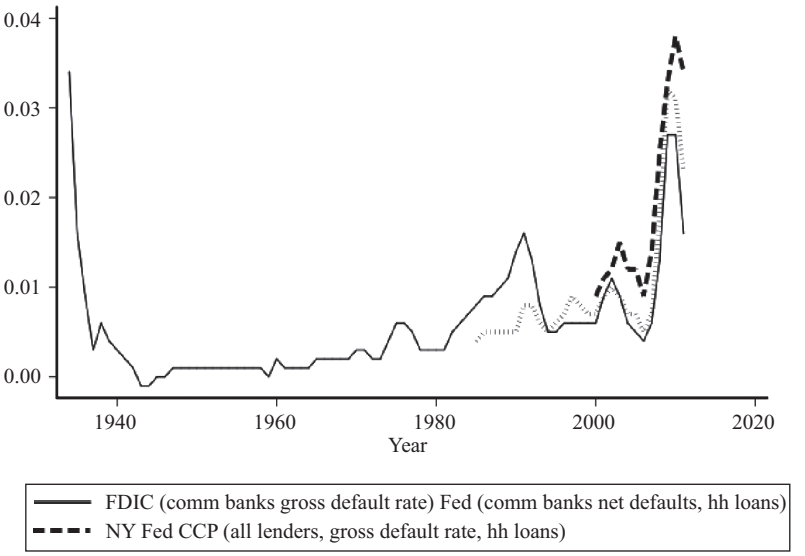
The Fed does not report commercial bank default losses by loan category for years prior to 1985. So for 1934–1984, we use the gross chargeoff rate on all commercial bank loans as reported to the FDIC. During the late 1980s, when default losses on commercial real-estate loans were very high, this measure gives an overestimate of the share of household debt charged off. (This does not affect our results, since the disaggregated default loss series is available for that period.) But otherwise, the default experience of household debt appears to be similar to that of commercial bank loan portfolios as a whole.

Figure 3 shows the fraction of loans to households written off by each of these three measures.

3.3 Results

Figure 4 shows annual changes in leverage and the contributions of new borrowing (expenditure minus income), debt defaults, and the three Fisher variables respectively. The contribution of each Fisher variable to the change in leverage (shown individually in Table 3) is equal to the value of the variable multiplied by the debt stock at the end of the previous period. Figure 4 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. In the 1930s, the trajectories of debt–income ratios and of new borrowing are almost inverted. Comparing the period 1964–1983 to the period 1984–1995, we see that households were running primary deficits (expenditure exceeded income) in the first period, but primary surpluses in the second; but household leverage was essentially flat in the first period and rose sharply in the second.

Figure 5 expands on Figure 4 and decomposes the aggregated Fisher-variable trajectory into the contributions of its three component variables. The bars show the aggregate contribution of the three variables, as in Figure 4. The lines show the



Notes: Annual debt chargeoffs as a fraction of debt outstanding. Default series 1 is the gross chargeoff rate for all loans by commercial banks, as reported by the FDIC. Default series 2 is the net chargeoff rate for commercial bank loans to households, as reported by the Federal Reserve. Default series 3 is the gross chargeoff rate for all household debt, as reported in the New York Fed Consumer Credit Panel (CCP). Series 3 is the preferred measure for our purposes.

Figure 3 Annual share of debt written off, 1985–2011

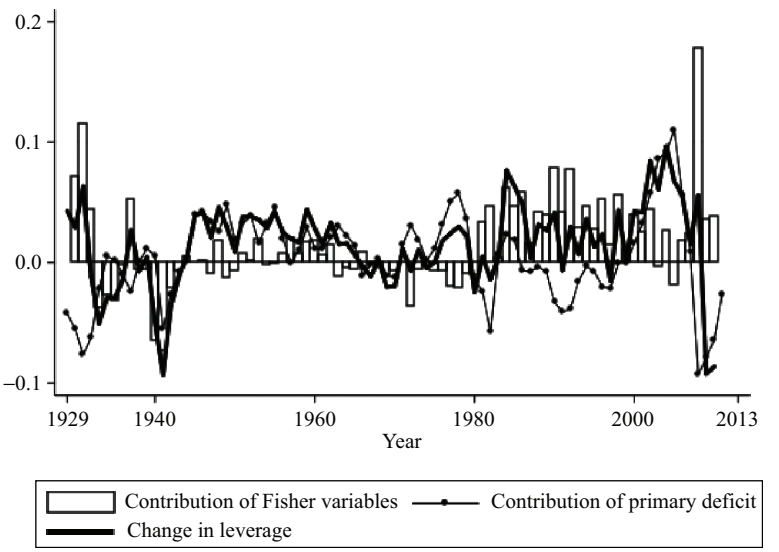


Figure 4 Contributions of Fisher variables and deficit to leverage

Table 3 Decomposition of change in household debt–income ratio, in percentage points per year

	Δ *b*	Attributable to:				
		Primary deficit	Interest	Growth	Inflation	Default
1929 to 1932	3.1	−5.9[a]	2.7	1.9	3.1	n/a
1933 to 1945	−1.9	−0.6	2.1	−2.5	−1.2	−0.3
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 2011	2.8	0.1	9.7	−2.9	−2.8	−1.5

Notes: This shows the annual change in the household debt–income ratio in eight distinct periods (first column) and the contributions to that change of primary deficits and interest, growth, inflation rates and defaults. A negative number represents a component reducing in leverage and a positive number one increasing it. The sum of the contributions is not exactly equal to the change in the debt ratio due to interaction effects.

a. As default data is not available for this period, debt writeoffs contribute to the observed primary surplus. The true primary surplus for this period will be closer to zero.

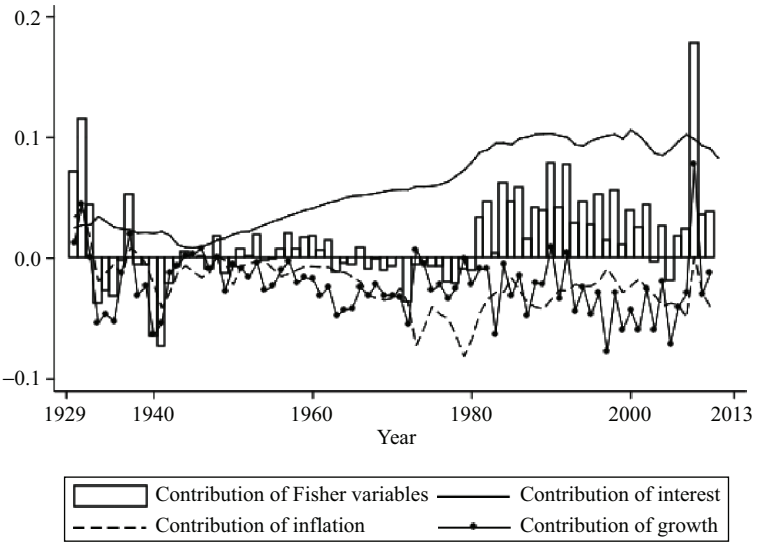
contributions of each of the three components.[5] One clearly sees here the extent to which falling income raised leverage in the early 1930s and in 2009, and how deflation raised leverage in the 1930s and inflation held it down in the later 1960s and 1970s.

Another striking feature is the large increase in the contribution of interest payments to leverage in the 1980s, and stability thereafter. The relatively constant interest contribution over the past 25 years reflects the fact that interest rates facing households have declined at about the same rate as the debt ratio has increased, resulting in constant debt-service burden.

Table 3 presents the same information as Figures 5 and 4. It outlines eight distinct periods. The exact periodization is not based on any formal test, and nothing hinges on the precise dates chosen; but visual inspection of the figures does suggest a clear division between periods of rising, stable, and falling household debt–income ratios. What this table shows is that changes in debt–income ratios are not a good guide to borrowing.

Looking at the first two lines of Table 3, we see that household debt–income ratios rose at 3.1 points per year between 1929 and 1932, and then fell at an average rate of 1.9 points from 1933 through 1945. But this did not imply any shift on the part of the household sector from deficit to surplus. On the contrary, borrowing by households was 5 points higher in 1929–1932 than in 1933–1945. The dramatic shifts in household debt–income ratios in this period are almost entirely explained by the large movements in nominal income during this period. Between 1940 and 1945 (not broken out in the table), household debt–income ratios fell by 19 points, from 0.35 to 0.16. Yet households did not pay down any debt during this period. Accumulated

5. The lines show the respective contributions to the growth of leverage, not the variables themselves – that is, they show each variable times the start-of-period debt stock.



Notes: This figure shows the shares of leverage changes accounted for by the three variables. The bar is the contribution of the Fisher variables, the three lines break up the contributions by the real growth rate of household income, inflation and the nominal interest-rate ratios.

Figure 5 Break-up of Fisher variables

primary surpluses totaled 5 points, compared with accumulated interest payments of 9 points. The entire fall in debt ratios was explained by inflation (11 points) and income growth (16 points).

Moving to the postwar era, we see that the 2.9 point per year increase in debtin the immediate postwar period was very close to the 2.6 point average primary deficit in this period. The stabilization of leverage after the mid 1960s reflects lower household expenditure relative to income. However, while household primary deficits were on average 1.8 points lower in 1964–1983 than in 1946–1963, the contribution of accelerating inflation was almost twice as large, reducing debt ratios by 3.3 points more per year period. Faster growth also played a role, reducing debt ratios by 1.1 points more per year in the second period. This was offset, however, by a 3.5-point increase in the contribution of interest payments.

A more dramatic divergence between leverage and borrowing appears in the fifth period, 1983–1994. New borrowing by households in this period averaged 1.9 points lower than in the previous period – an even larger fall than that between 1946–1963 and 1964–1983. This fall in new borrowing was enough to move the household sector into primary surplus. Yet despite this sharp fall in household borrowing, household debt–income ratios *rose* in this period by 3.2 points per year. This was a faster rate of increase than in the immediate postwar years, despite the fact that funds flowing to households through credit was –1.1 percent of income in this period. Higher nominal interest rates added 3.5 points more annually to the ratio than in the preceding period.

Lower inflation (1.1 points) and slower income growth (0.6 points) also contributed. Stabilization of debt ratios in the later 1990s also owed nothing to any change in borrowing behavior. Both primary deficits and total borrowing were essentially

unchanged between the two periods. Rather, the slower rise in debt ratios in the 1990s compared with the 1980s was entirely the result of faster income growth.

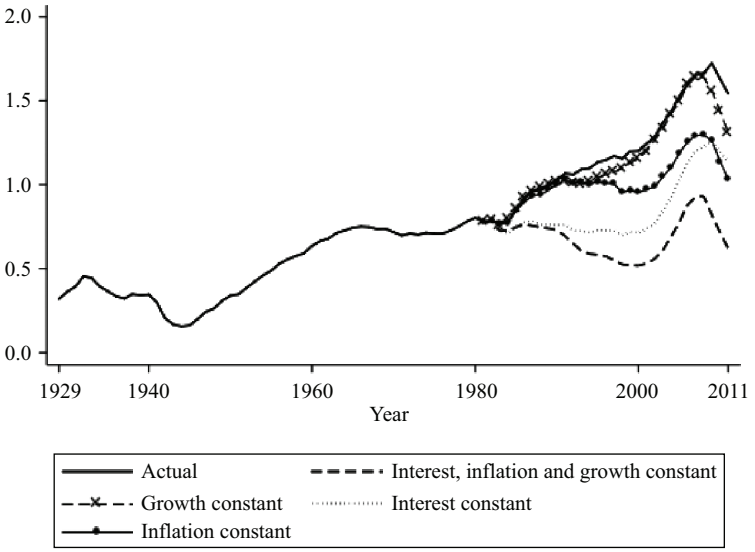
Only during the housing bubble and its aftermath do we see something like the conventional story of changes in debt ratios reflecting changes in debt-financed expenditure. The 40-point rise in household debt–income ratios during this period is almost exactly equal to households' accumulated household primary deficits. In fact, the swing from surplus to deficit during the housing boom was even greater than the acceleration in leverage growth, as higher borrowing was partly offset by higher inflation (which reduced leverage by 1.3 points per year more in this period) and higher defaults (which reduced it by 0.7 of a point per year more). Similarly, the 10-point swing in annual debt ratio growth – from plus 5.8 points per year to minus 4.1 pointsafter 2007 – is still not as large as the 12-point swing in the household primary balance.

The dramatic fall in household borrowing, plus the 3.6-point increase in the share annual reduction of leverage through default, was offset by lower inflation and negative income growth. Overall, households reduced their debt in this last period by 4.1 points per year, while defaults reduced leverage by 5.1 points per year, up from 1.5 points in 2000–2007. If the share of household debt written off by default had remained constant at its pre-2008 level, the reduction in household leverage over 2008–2011 would have been just 0.6 points per year – less than one-fifth of its actual value.

Over the full 1984–2011 period, 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 households ran cumulative primary deficits equal to just 3 percent of income over 1984–2012 (compared to 20 percent in the preceding period). 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.

3.4 Counterfactual scenarios

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 household primary balances had been the same as in reality but growth, interest, and/or inflation rates had remained constant at the pre-1980 level. The result of that simulation exercise is shown in Figure 6. 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 i, π, and g had been fixed at their 1946–1983 average levels for the whole period. The other three lines show scenarios with growth, inflation, nominal interest rates, and real interest rates ($i - \pi$) respectively fixed at their average levels while the others vary historically. 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 been roughly stable. Leverage would even have decreased slightly over the whole period from 1960 to 2010. 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 ratios since 1980 have been driven by Fisher dynamics, not changes in borrowing.



Notes: The figure shows the result of simple simulation exercises where the real growth rate of income, the inflation rate, and the nominal interest rate respectively are fixed at their 1946–1983 averages, while the other variables and the household primary balance take their historical values.

Figure 6 Counterfactual evolution of household leverage 1983–2012, given 1946–1983 average values of i, g, and π.

4 HOUSEHOLD DEBT AND AGGREGATE DEMAND

Many discussions of household debt are based on the assumption – explicit or implicit – that there is a direct relationship between changes in household leverage and aggregate demand. Following the last major episode of credit crisis and deleveraging in the late 1980s, a number of economists developed models in which changes in household debt contributed to changes in aggregate demand (Caskey and Fazzari 1989; Eichner 1991; Palley 1994). Similar suggestions are often made in popular and policy-oriented discussions of household debt (Krugman 2013; Henwood 2014). It seems intuitive that an increase in household debt must, all else being equal, reflect greater spending by households relative to their incomes. And higher spending should mean greater demand for current output. But in fact there is no logical necessity that rising debt–income ratios be associated with increased aggregate demand. Two conditions are necessary for this relationship to hold. First, changes in debt ratios must be due to changes in borrowing, rather than changes in the growth rate of nominal income. And second, if households are borrowing more, this must be financing increased expenditure on currently produced goods and services.. Historically, only in a minority of cases do large shifts in the trend of household leverage correspond with large shifts in household demand for currently produced output.

As we saw in Section 3, 1946–1963 and 2000–2007 saw rises in household debt–income ratios mainly because of increased household borrowing. The conventional story in which debt ratios are a proxy for aggregate borrowing behavior is reasonable for those two periods. But in all other periods borrowing behavior played a minor or no

role. After the 1980s, changes in leverage were mostly due to increases in interest rates relative to growth rates. One may say that the 1980s were the second episode of debt disinflation in the United States, after the 1930s. This is also true of the post-1983 period as a whole.

4.1 Demand and non-demand expenditures

We now ask whether changes in borrowing have been historically reflected in changes in expenditure on currently produced goods and services. Here again, the answer is generally negative: sometimes they have, but often they have not. So the claim that changes in household leverage reliably correspond to changes in aggregate demand fails at the second step as well as the first.

To analyse the link between credit and demand, we separate household expenditures that contribute to demand for current output from expenditures that do not. The former includes investment in owner-occupied housing as well as those components of consumption that reflect cash outlays by households on current output. A number of the series we use to distinguish demand from non-demand expenditure do not exist prior to 1948. So we limit our discussion of debt and demand to the postwar period. As in the previous section, we normalize each variable by adjusted household income. Panel A of Table 4 shows the average values for each of our six postwar periods. Panel B shows the difference from the preceding period; for 1984–2011, this means the change from 1948 to 1983. Column 2 shows total borrowing – that is, the primary

Table 4 Annual household borrowing and uses of funds, in percent of adjusted income

Panel A: Levels

	Borrowing	Demand	Non-Demand		*Memo:* Δb
			Interest	Other non-demand	
1948 to 1963	5.8	95.4	3.3	7	2.9
1964 to 1983	7.3	90.9	6.4	9.9	0.2
1984 to 1993	9.2	93	10.3	5.9	3.2
1994 to 1999	9.2	96.4	10.0	2.7	1.7
2000 to 2007	15.7	96.2	9.9	9.5	5.8
2008 to 2011	2.0	84.8	8.7	7.0	–4.8
1948 to 1983	6.7	92.8	5.2	8.7	1.3
1984 to 2011	10.1	94.1	9.9	6.1	2.8

Panel B: Difference from previous period

	Borrowing	Demand	Non-demand		*Memo:* Δb
			Interest	Other non-demand	
1964 to 1983	1.5	–4.5	3.1	2.9	–2.7
1984 to 1993	1.49	2.1	3.9	–4.0	3.0
1994 to 1999	0.0	3.4	–0.2	–3.2	–1.5
2000 to 2007	6.5	–0.2	–0.1	6.8	4.1
2008 to 2012	–13.2	–7.4	–0.9	–4.9	–9.9
1984 to 2012	3.4	1.2	4.8	–2.6	1.5

deficit plus interest payments. Column 3 shows spending that contributes to aggregate demand: consumption excluding imputed non-cash items, plus residential investment. The next two columns show spending that does not contribute to aggregate demand: interest payments, and a residual that includes transfers and net acquisition of financial assets. The final column shows the change in debt–income ratios, the same as in Table 3.

Table 4 shows that there is not a tight link between borrowing and aggregate demand. Comparing the first two postwar periods, for example, total annual borrowing was approximately 1.5 points higher in 1964–1983 than in 1946–1963. But household contribution to aggregate demand was 4.5 points lower in the second period than in the first, because of the large increases in net acquisition of financial assets and in interest payments. Similarly, there was no change in borrowing in 1994–1999 compared with 1984–1993, and debt growth decelerated by 1.5 points per year. Nonetheless, the household contribution to demand was more than 3 points higher in the later period.

Perhaps most strikingly, the large increase in borrowing and debt growth in the housing boom period was not associated with any increase in demand from the household sector. While residential investment as a share of income was 1.2 points higher than in the late 1990s, on average, adjusted consumption was 1.4 points lower.[6] In part, this reflects the fact that our periodization is based on trends in leverage. Household debt peaked in 2008, but residential investment peaked in 2005, and by 2008 was falling steeply. If we looked just at 2000–2005, household demand would look higher. But it is also the case that when measured in terms of market purchases by households, consumption in the 2000s is lower than in the late 1990s – the opposite pattern from the official measure of consumption. This difference is due in about equal measure to (i) the contribution to measured consumption of imputed rents of owner-occupied housing, in turn the result of rising home prices; and (ii) the rapid increase in this period of Medicare and Medicaid and employer health contributions. Both of these are counted in official measures of household consumption but, as neither is a cash payment by households, neither is counted in ours. Because both these categories of imputed spending rose more rapidly in 2000–2007 than in previous years (the first as a mechanical result of the housing boom itself), removing them reduces household growth disproportionately in this period.

Finally, in the recession and recovery years of 2008–2011, while the change in leverage, household borrowing, and household demand all fall steeply, we can see that the change in leverage understates the fall in borrowing but overstates the fall in household demand.

So while the link between borrowing and leverage correctly describes two of the four episodes of rising household leverage since 1929, the link between leverage and demand describes only one of them: the postwar housing boom of the 1950s. For the rest of the postwar period, this assumption, even as a first approximation, is false.

5 CONCLUSION

A clear picture of the relationship between changes in household leverage, household borrowing, and aggregate demand is obscured by the failure to use appropriate accounting. Conventional savings rates combine changes in the asset and liability

6. This more detailed breakout is not shown in Table 4, but is available on request.

sides of balance sheets; they have no reliable relationship to changes in credit flows to households. Headline measures of household income and consumption are similarly problematic in the context of discussions of credit and debt, as they include substantial non-market, imputed payments (most importantly the imputed rent paid by homeowners to themselves) and substantial third-party payments for health and pension benefits. Discussions of household leverage will also be misleading if they ignore the denominator of the debt–income ratio and implicitly assume that its evolution is solely the result of changes in household borrowing.

A conceptually appropriate accounting framework shows that changes in household debt–income ratios since 1929 are not driven mainly by changes in household borrowing behavior. In particular, the rise in household leverage since the early 1980s is entirely attributable to higher interest rates, lower inflation, and lower income growth, in that order; household borrowing plays no role. In this sense, the rise in debt following the 'Volcker coup' (Duménil and Lévy 2011) is best thought of as a debt disinflation analogous to the debt deflation of the 1930s.

5.1 Debt as a monetary phenomenon

It was one of the great insights of Keynes that modern economies cannot be conceived of only as 'real exchange' economies; many important questions can be answered only in terms of a model of a 'monetary production' economy (Leijonhufvud 2008) After Keynes, the real-exchange vision was reasserted by allowing for the existence of money as a special asset required for exchange, but ignoring liabilities, an approach sometimes called 'Monetary Walrasianism' (Mehrling 2014). Admittedly, Keynes left the way open for this interpretation by retreating from the sophisticated account of financial markets in the *Treatise on Money* (1931) to the exogenous money supply assumption of *The General Theory* (1936) (see Bibow 2000). But in a world where liquidity cannot be identified with any particular asset but is essentially a social relation, analysis of the financial side of the economy requires discussing the asset and liability side of balance sheets independently, rather than netting them out as the pseudo asset 'net wealth' (Beggs 2012). Any discussion of debt, in particular, must start from the fact that it is a financial liability, and not simply a negative asset or an accumulated excess of consumption over income. To understand the evolution of debt over time and its macroeconomic implications, we need a framework that focuses specifically on the liability side of household balance sheets. Regarding debt as merely a counterpart of some broader aggregate like saving, consumption, or wealth mixes it up with payment flows that behave quite differently, and therefore gives a misleading picture of its evolution over time.

Both mainstream and many heterodox economists tend to analyse debt in terms of real flows. In such stories, debt is determined by the intertemporal allocation of consumption, by the level of desired spending on real goods and services, or perhaps by the distribution of income. But, in fact, the financial relationships reflected on balance sheets and the real activities of production and consumption compose two separate systems, governed by two distinct sets of relationships. Explanations that reduce debt to the financial counterpart to some real phenomena ignore the specifically financial factors governing the evolution of debt. The evolution of demand and production has to be explained in its own terms, and the evolution of debt and other financial commitments has to be explained in its terms. No simple story combining the two is likely to be useful or reliably consistent with the facts. As we have shown in this paper, this is

not merely a theoretical critique. As a historical matter, the evolution of household debt in the US bears little resemblance to any of the real variables whose financial counterpart it is imagined to be. They do interact, but they are not tightly linked. While some of the turning points in household leverage are indeed associated with turning points for production and consumption, most are not, but are the result of purely monetary–financial factors. Indeed, as a first approximation, it would be better to imagine household income and expenditure as evolving according to one set of systematic relationships, and household balance sheets evolving according to an entirely separate set of relationships. Balance sheets and real flows do interact, sometimes strongly. But conceptualizing the two systems independently is an essential first step toward understanding the points of articulation between them.

5.2 Policy implications

From a policy standpoint, the most important implication of this analysis is that in an environment where leverage is already high and interest rates significantly exceed growth rates, a sustained reduction in household debt–income ratios probably cannot be brought about solely or mainly via reduced expenditure relative to income. Even a modest increase in household expenditure from the very depressed levels of 2008–2011 would be sufficient to put leverage back on an increasing path, especially if default rates return to more historically typical levels. There is an additional challenge, not discussed in this paper, but central to both Fisher's original account and more recent discussions of 'balance sheet recessions': reduced expenditure by one sector must be balanced by increased expenditure by another, or it will simply result in lower incomes and/or prices, potentially increasing leverage rather than decreasing it (Koo 2008; Eggertson and Krugman 2012). To the extent that households have been able to run primary surpluses since 2008, it has been due mainly to large federal deficits and improvement in US net exports.

We conclude that if reducing private leverage is a policy objective, it will require some combination of higher growth, higher inflation, lower interest rates, and higher rates of debt chargeoffs. In the absence of income growth well above historical averages, lower nominal interest rates and/or higher inflation will be essential. How, or whether, monetary policy could deliver the latter is beyond the scope of this article. But it is worth noting that the effect on the existing debt burden– and not on 'real' rates on new loans – may be the most important macroeconomic consequence of low inflation in the present environment. Each year of inflation 1 point below target implies an additional $130 billion of foregone household expenditure to achieve a given reduction in leverage. Deleveraging via low interest rates, on the other hand, implies a fundamental shift in monetary policy. If interest-rate policy is guided by the desired trajectory of debt ratios, it no longer can be the primary instrument assigned to managing aggregate demand. This probably also implies a broader array of interventions to hold down market rates beyond traditional open market operations, policies sometimes referred to as 'financial repression.' Historically, policies of financial repression have been central to almost all episodes where private (or public) leverage was reduced without either high inflation or large-scale repudiation (Reinhart 2012). Finally, defaults may remain an important part of the deleveraging process. A recent IMF staff report notes that for public sector debt, defaults are most likely to lead a long-term improvement in the fiscal position (and have generally occurred historically) in countries with small primary deficits, or primary surpluses (Cottarelli et al. 2010).

In such cases, unsustainable debt growth is driven by the interaction of high effective interest rates with a large existing debt stock; a one-time reduction in the debt stock can change an unsustainable path to a sustainable one, even if the interest rates on new borrowing rise as a result. By the same logic, systematic debt forgiveness may be the logical, and perhaps unavoidable, path to lower leverage.

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