

## **What's Been Weighing on Consumption?**

### **An Overview of the Recent Experiences of Different Types of Households<sup>1</sup>**

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When most economists think about consumer spending, they start by thinking about an individual household. A household's spending patterns depend on its economic environment. That environment includes the household's income, its wealth, and the return to saving it faces. It also includes the household's ability to borrow and the uncertainty about its future income and spending needs. In addition, the household's spending depends on its preferences—such as its patience and aversion to risk—and any behavioral limitations for the household—such as an inability to plan effectively.

The intuitive appeal of this framework makes it a natural starting point for analyzing aggregate consumer spending. Empirical models of consumption commonly start from an implicit assumption that a single representative household accounts for all spending, so that aggregate consumption depends on aggregate income, aggregate wealth, the average interest rate for the economy as a whole, and so on. Such models are not only straightforward to specify but also convenient from a practical point of view because U.S. statistical agencies publish timely estimates of those data at a quarterly frequency.

Of course, it is widely understood that the results from such models only approximately describe the actual dynamics of aggregate consumption. The actual dynamics reflect the choices of millions of heterogeneous households—households that face very different economic circumstances and have different preferences. Therefore, a key question for analysts and policymakers is whether empirical models of aggregate consumption based on the representative household framework produce only small errors or could be astray in more significant ways.

Indeed, the dramatic developments in the U.S. economy and financial system in recent years may have diminished the usefulness of that traditional approach to modeling aggregate consumer spending. Different types of households had vastly different experiences before, during, and after the recent financial crisis. Further, aggregate consumption has failed to see the

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robust growth in this economic recovery that it has typically experienced in past recoveries—as can be seen in Figure 1, which plots the path of real personal consumption expenditures following the most recent business cycle trough (the thin red line) as well as the average path of this series following the cyclical troughs in 1970, 1975, 1982, 1991, and 2001 (the thick black line). Some analysts have argued that the behavior of certain subgroups of the population—such as those with very large amounts of debt—is contributing importantly to the weakness in aggregate consumer spending. If they are correct, then the usefulness of the traditional approach to modeling aggregate consumption depends on the degree to which the historical relationships between the aggregate explanatory variables capture such behavior.

As yet, there is no consensus about how best to capture heterogeneity in empirical models of aggregate consumer spending. Further, lags and gaps in data about individual households have made it difficult to even gauge the importance of doing so. Potentially, though, achieving a better understanding of the ways in which heterogeneity across households affects aggregate consumer spending could make an important difference in forecasting economic outcomes and thereby an important difference in the conduct of monetary policy. The goal of this meeting at the Federal Reserve is to fill some of the holes in our understanding. This paper presents an overview of the issues to lay some groundwork for the more detailed discussions of specific aspects of heterogeneity in the other papers.

### **Why Might Heterogeneity Matter for Aggregate Consumer Spending?**

The existence of individual households does not by itself invalidate the practice of modeling aggregate consumer spending as if it reflected the behavior of a single representative household. If all households behaved in the same way when faced with the same economic environment, and all changes to the economic environment were distributed evenly and consistently over time, this approach might capture aggregate consumption dynamics very well. In practice, however, those conditions are *not* met.

First, different types of households will respond differently to given changes to their economic environment. Even in economists' simplest model of consumption where all households are rational, have similar preferences, and can borrow easily, propensities to consume out of changes in income and wealth are predicted to vary with age: Younger households should raise their consumption less in response to an unexpected windfall than older

households because they are spreading the extra resources over more years. In addition, households differ in their preferences in more fundamental ways. For example, some households are more patient than others; relative to otherwise similar households, more patient households will tend to consume less and save more out of a given increase in income or wealth. Also, a growing body of evidence suggests that some households have cognitive limitations that affect their decisions. In particular, households that have self-control problems or difficulty planning over long horizons should be more likely to consume a one-time windfall right away rather than spreading it out over time.

Looking beyond this stylized model, some households have more difficulty borrowing than others, which should change the way in which they respond to shocks to their economic environment. Households that can borrow easily will raise their consumption relatively quickly when they receive good news about their future income, but those that cannot may need to wait until they have more income in hand. As a result, borrowing-constrained households tend to be less sensitive to news about their future income and more sensitive to changes in their current income than other households are. In addition, borrowing-constrained homeowners may have larger consumption responses than other homeowners to appreciation in house prices, because such appreciation raises the collateral against which they can borrow and enables those households to finance additional consumption through a home equity loan or a cash-out refinancing.

The second reason why aggregate consumer spending does not mimic the behavior of a single representative household is that changes to the economy are distributed both unevenly and inconsistently over time. Note that unevenness in economic shocks alone is not sufficient to invalidate a model of consumer spending based on aggregate determinants of spending. As long as the way in which shocks are distributed across the population does not change over time, the estimated coefficients—which will reflect the average changes in the economic environment (and the average responsiveness of households to those changes)—should be valid tools for forecasting aggregate consumer spending. However, if the unevenness varies over time, then models based on aggregate income, aggregate wealth, and other aggregate variables will be inadequate to at least some extent.

Indeed, there are reasons to think that the distribution of shocks across the population is not consistent over time. For example, the way in which a given change in aggregate income is

distributed has likely changed with the substantial widening of the income distribution over the last several decades that has been documented by the Congressional Budget Office (2011) and others. In addition, there has been significant fluctuation in the relative importance of different components of household wealth over time, with the share of assets accounted for by stocks (directly and indirectly held) rising from less than 15 percent in the early 1990s to around 35 percent near the peak of the stock market bubble before dropping back to roughly 25 percent in the past couple of years. These trends suggest that movements in aggregate income and wealth may be distributed among different subgroups in the population—that have different propensities to consume—in ways that vary over time; the trends thus lend instability to the relationship between consumption and these aggregate variables. The relationships could also vary over time if the propensities to consume of different subgroups change. For example, there is evidence that increases in access to credit over the last few decades of the last century led to a decline in the sensitivity of aggregate consumption to aggregate income (Dynan, Elmendorf, and Sichel, 2006).

Trends that occur over long periods of time are not the only source of such concerns. The distribution of aggregate shocks and the responsiveness of different groups to shocks could also change with the business cycle or other events. The past few years provide a dramatic example of changes over a shorter horizon that may have altered the relationships embedded in traditional empirical models of aggregate consumption.

### **Recent Variation in the Determinants of Consumer Spending**

The determinants of consumer spending have varied in significant and unusual ways during recent years. At the same time, aggregate consumer spending has not increased during this economic expansion with the same vigor it showed during most previous expansions. The key question at hand is whether that disappointing outcome can be explained solely through the traditional relationships between aggregate consumption and aggregate measures of the determinants of consumption, or whether that outcome can be better understood by incorporating heterogeneity across households in the determinants of consumption and in their responses to those determinants.

The other papers prepared for this meeting analyze individual determinants of consumption in detail. Here I set the stage for those analyses by reviewing the recent variation in the chief determinants of consumption with an emphasis on whether the movements in those

variables may have diminished the usefulness of the traditional representative-household approach to empirical modeling of aggregate consumption. To be sure, consumption modelers have tried to make use of some basic decompositions of aggregate income and wealth and to introduce some additional terms to capture certain aspects of heterogeneity. I include such common refinements in the discussion that follows.

### *Income*

Growth in aggregate real disposable personal income—personal income (including transfer payments) less personal taxes adjusted for price changes as published in the National Income and Product Accounts (NIPA)—has been sluggish, on net, in recent years. On average, it has risen at an annual pace of just 1.1 percent since the recovery began in mid-2009. Among the components of personal income, growth in employee compensation has been held down by the tepid recovery in labor markets, and personal interest income dropped by nearly one-third between late 2008 and mid-2010 and has seen essentially no recovery since then. The weak growth in aggregate income helps to explain the weak growth in aggregate consumption.

Moreover, to the extent that the weakness in aggregate income over the last few years has been unusually concentrated among lower-income households, one might expect a more powerful-than-normal effect on consumption. Low-income households are more likely to face credit constraints, which should make their spending more responsive to changes in current income. Some studies have also suggested that they may be more impatient (Lawrance, 1991) and less financially sophisticated (see, for example, Lusardi and Tufano, 2009, and Bucks and Pence, 2008) than other households; both traits might also contribute to a greater sensitivity of consumption to current income. Indeed, some researchers have concluded that the marginal propensity to consume out of current income is higher for lower-income households (see, for example, Dynan, Skinner, and Zeldes, 2004, and Johnson, Parker, and Souleles, 2006).

That said, it is not clear that households at the lower end of the income distribution do account disproportionately for the recent weakness in aggregate income. Unemployment rates have risen more (and recovered less) for younger workers, workers with less education, and minorities, and Perri and Steinberg (2012) found that before-tax earnings in the bottom 20 percent of the distribution fell by about 30 percent relative to the median between 2008 and 2010. However, those authors also show that the disparity disappears once taxes and transfers are

accounted for, with the ratio of disposable income at the 20<sup>th</sup> percentile to disposable income at the median little changed, on net, between 2008 and 2010. Moreover, developments at the top of the income distribution also do not suggest a disproportionate hit to lower-income households. Using data from tax returns, Saez (2012) showed that the share of income going to the top decile fell, on net, between 2007 and 2010 (taking back a small portion of the substantial rise seen since the early 1980s). The decline in that share was driven by a considerable drop in realized capital gains, which are not included in the NIPA measure of disposable income typically used in aggregate models of consumption; But, even excluding this component, the top income share has risen only a little since 2007.

In the simplest empirical models of aggregate consumer spending, such spending depends on aggregate income (and various non-income variables). One common refinement to such models to account for distributional issues is to include aggregate transfer income separately from the rest of income in recognition of the higher propensities to consume of the population receiving this type of income.

All told, the weakness in income in recent years has certainly contributed to the sluggish recovery of consumption. In addition, households in the lower part of the income distribution have probably reduced their consumption more than households higher in the income distribution for every dollar of income lost. One would expect traditional empirical aggregate consumption functions to capture such effects to the extent that the distribution of the shock to income and the income sensitivity of different types of households are typical of past experience. The limited analysis in this paper does not suggest an obvious reason that distribution-related income issues are causing an outsized response of aggregate consumption to aggregate income, but the topic certainly warrants more examination.<sup>2</sup> A separate issue is whether the responsiveness of different types of households to changes in income may have changed—I return to this question in my discussion of debt issues below.

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<sup>2</sup> A related income development that needs to be explored is the shift in personal interest income. In dollar terms, the peak-to-trough decline in such income was about as large as the decline in total disposable income. Although interest income typically falls along with interest rates in cyclical downturns, the decline in such income in the current cycle has been materially larger than in the past (just as the sustained low level of interest rates is unusual by past experience). Older households are more dependent on interest income than younger households and are predicted to have high marginal propensities to consume out of shifts in income, so this compositional effect might be helping to hold down consumer spending.

## *Wealth*

Prior to the recent financial crisis, the United States saw considerable run-ups in stock prices and home prices. Aggregate household net worth relative to disposable income rose sharply to a high of 6.5 in mid-2007, noticeably above the peak reached during the stock market boom of the late 1990s. However, the gains in wealth proved transitory, with home prices beginning to decline in 2006 and stock prices turning down in late 2007. By early 2009, aggregate stock market wealth was 50 percent below its peak in October 2007, and the aggregate value of household real estate holdings was down 26 percent from its peak two years earlier. The ratio of aggregate household net worth to disposable income bottomed out at 4.7 in early 2009, its lowest level since the mid-1980s. The ratio has since returned to around 5.0 because of a partial recovery in stock prices, but home prices have continued to slip, on net, over the past few years. The weak performance of aggregate wealth helps to explain the weak growth in aggregate consumption.

Comprehensive high-quality data that would allow for a detailed distributional analysis of the decline in household wealth are not yet publicly available, but one can make inferences based on the prior distribution of wealth holdings. Results from the 2007 *Survey of Consumer Finances* (as tabulated by Bucks, Kennickell, Mach, and Moore, 2009) suggest that wealth losses in recent years have been concentrated along several dimensions. First, and not surprisingly, households with higher income probably suffered larger dollar losses in wealth.<sup>3</sup> For both stocks and houses, ownership rates and amounts owned conditional on ownership were higher for households with higher incomes. Second, households approaching retirement were probably hit especially hard. Around 60 percent of households in the 45 to 54 and 55 to 64 age groups owned stocks (both directly and indirectly through mutual funds, defined contribution retirement plans, and the like). Conditional on owning stocks, median holdings were particularly large for the 55 to 64 group, and, as shown by Coronado and Dynan (2011), the share of assets represented by stocks was considerably higher for the 55 to 64 age group than for any other age group. Households with heads between ages 55 and 64 also had relatively sizable holdings of residential real estate, with both ownership rates and median holdings at the top end of the range for the various age groups. Third, the loss in household wealth was concentrated geographically. Although households in the

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<sup>3</sup> Changes in wealth measured in dollars are more relevant than changes in wealth measured in percent for this analysis, because the latter may be quite high for households with small amounts of assets and still not affect their spending very much.

Northeast and West had somewhat lower rates of homeownership than households in other parts of the country in 2007, median home values at that time were much higher in those regions. That pattern, together with the larger subsequent declines in home prices in these regions, implied larger losses in housing wealth among households in the Northeast and West than households in other regions.

In the simplest empirical models of aggregate consumer spending, such spending depends on aggregate household wealth (and various non-wealth variables). Aggregate wealth is highly correlated with aggregate consumption: As can be seen in Figure 2, the ratios of household wealth (thin red line) and personal consumption expenditures (thick black line) to disposable personal income have moved together fairly consistently over the last several decades. However, economists have long worried about whether households react differently to changes in the value of different types of assets.<sup>4</sup> For example, Buiter (2010) and others have argued that house value appreciation should affect households' budget constraints much less than, say, productivity-driven stock price appreciation because the former is associated with a higher future cost of housing consumption. In the other direction, some analysts have argued that the marginal propensity to consume out of housing wealth should be *higher* than for stock market wealth because housing is more broadly owned than stocks (about two-thirds of households owned homes over the past decade as compared with only about half owning stocks in some form) and homeownership is much more likely than stock ownership for groups with lower incomes and education. In addition, the marginal propensity to consume out of increases in house prices might be particularly high for homeowners who were previously unable to borrow enough to consume as much as they wished given that higher home values provide more collateral against which to borrow.

Such arguments have led some analysts to include separate terms for housing and other types of wealth in their empirical consumption functions. Point estimates from such specifications are often consistent with the view that the aggregate marginal propensity to consume out of housing wealth is higher than for other types of wealth (see, for example, Carroll, Otsuka, and Slacalek, 2011, and Davis and Palumbo, 2011). However, the standard errors on the estimated coefficients from such models are generally large enough that the

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<sup>4</sup> There has also been debate (especially recently) about whether liabilities play a special role, but that issue will be deferred to the next section.



estimated differences in marginal propensities to consume out of different types of wealth are not statistically significant from zero.

A separate issue is whether there have been longstanding trends or recent developments in the distribution of shocks to wealth across households or in those households' reactions to such shocks that have altered the relationship between aggregate consumption and aggregate wealth. For example, financial innovation over the past several decades probably made aggregate consumption more sensitive to changes in house prices because the expansion of home equity lines of credit and cash-out refinancing has made it easier to liquefy housing capital gains. As another example, the development of mutual funds, 401(k) accounts, and similar products has made it easier for households in lower parts of the socioeconomic spectrum to own stocks, which probably made aggregate consumption more sensitive to stock price changes. Such trends warrant further study, although their gradual nature will likely make identification in a model of aggregate consumer spending difficult. Moreover, the issues may be more complicated than they initially seem. For example, the marginal propensity to consume out of capital gains associated with retirement accounts may be lower than gains associated with other types of accounts if households view such savings as "off limits" for spending before retirement. There is even some evidence that the sign of the effect on current spending could be different from the usual effect: Choi, Laibson, Madrian, and Metrick, 2009, find that 401(k) investors tend to raise their contributions after experiencing particularly good returns on their savings.

To sum up, the decline in aggregate wealth over the past half decade has been a headwind for aggregate consumption. One would expect significant variation in the degree to which wealth has held down consumption for different types of households, given both the uneven distribution of the wealth losses and the probable differences in sensitivities of the groups to such losses.<sup>5</sup> However, demonstrating that heterogeneity among households has changed the relationship between aggregate wealth and aggregate consumer spending during the past few years would require further analysis beyond the limited discussion possible in this overview paper.

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<sup>5</sup> The evidence to date on this point is fairly limited, largely because of a lack of data with which to study the issue. However, Dynan and Coronado (2011) found that households on the cusp of retirement have generally made sharp and broad-based reductions in their spending, in contrast to the fairly muted reductions that have generally been made by households in the age categories on either side of this group.

## *Credit*

Amid the boom in equity and home values in the early and mid-2000s, households took on unprecedented amounts of debt. The ratio of household debt to disposable income rose steadily in the 1980s and 1990s as the liberalization of financial markets and improvements in technology for assessing risk increased access to credit and lowered the cost of borrowing. But, the trend sharply accelerated in 2002, with the ratio of household debt to disposable personal income surging above 1 and reaching a peak of about 1.3 in the third quarter of 2007. As shown in Figure 3, the rise was entirely accounted for by an increase in mortgage debt. The rise in aggregate outstanding debt pushed up the aggregate debt service ratio, the estimated share of disposable personal income committed to households' required payments on debt, shown in Figure 4. However, the increase in debt service obligations ratio was not as striking as the increase in outstanding debt because of the low interest rates on household loans in the early and mid-2000s.

Defaults on household debt began to rise sharply after house prices turned down in mid-2006, leading to a pullback in the supply of credit, which—together with continued house price depreciation—produced yet more debt-related distress. Ultimately, the U.S. economy entered a full-blown credit crunch as part of the global financial crisis. Since that time, aggregate household debt has fallen substantially; the ratio of household debt to disposable personal income now stands at its lowest level since late 2005 and the aggregate debt service ratio has fallen to its lowest level since the series began in 1980. The available evidence suggests that both high levels of defaults and low levels of new borrowing are contributing importantly to the decline. New borrowing has likely been held down both by low demand for loans and by restricted supply. Although credit supply conditions have been slowly thawing, they remain tight—data from the Federal Reserve Senior Loan Officer Survey show only a short period of modest easing following a much longer period of substantial tightening (Figure 5).

The most notable distributional aspect of the run-up in mortgage debt in the pre-crisis period is the strong regional pattern. States that experienced stronger housing booms tended to see considerably larger increases in average household indebtedness in the early to mid-2000s. Even within these states, the increases were not spread out evenly, resulting in concentrations of highly indebted and vulnerable households. For example, Dynan (2012) shows that homeowners in the top quintile of mortgage leverage in housing boom states had 2½ times as much mortgage

debt as other homeowners in these states in 2007 and 2 times as much mortgage debt as highly-leveraged homeowners in non-boom states.<sup>6</sup> Highly leveraged homeowners in boom states also had debt service obligations that amounted to 34 percent of their *pre-tax* income in 2007—double the comparable figure for other households in these states.

The decline in aggregate debt since 2007 also appears to be geographically concentrated. Estimates of average debt per capita for selected states from the Federal Reserve Bank of New York show much larger declines in states that experienced more pronounced housing busts than in other states. Presumably, some of the households who took on the most debt during the boom have experienced large subsequent reductions in their debt holdings through default. However, evidence in Dynan (2012) suggests that others in this group had made little progress reducing their leverage as of 2011. The continued vulnerability of these households is illustrated by the fact that the share of highly leveraged homeowners in boom states reporting that they were somewhat or very likely to have trouble making their mortgage level was essentially unchanged, at about 25 percent, between 2009 and 2011.

High levels of debt might matter for consumer spending for several reasons. First, some households may target a given level of leverage; the sharp rise in leverage that occurred with the slump in house prices may have induced these households to pare back their consumption in order to pay down debt. Second, financial institutions are typically less willing to lend to households with higher levels of leverage. As a result, the rise in leverage is impeding some households from borrowing more to finance consumption and also hindering the ability of some to raise their discretionary cash flow by refinancing into lower-rate mortgages. Similarly, the burden associated with debt service obligations might matter for the willingness or the ability of households to borrow. Evidence in Dynan (2012) and Mian, Rao, and Sufi (2011) supports the notion that high levels of debt have contributed to the recent weakness in consumption, though neither study pinpoints the channel through which this is occurring.

Empirical models of aggregate consumption do not typically include aggregate household debt as an explanatory variable. The above discussion highlights one problem with this series—it may not adequately capture important pressures building up in sub-groups of the population. For example, the 2002-2006 increase in aggregate debt, though more concentrated over time, was no larger in magnitude than the rise over the preceding two decades. And, as documented by Dynan

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<sup>6</sup> Housing boom states were defined as states in the top quartile of house price appreciation between 2000 and 2006

(2009), the earlier rise was fairly spread out across the population. A second problem with putting debt into an empirical consumption function is that debt is often used to finance spending spurred by an unrelated development, such as good news about future income. It is generally difficult to disentangle this positive (and endogenous) relationship between household debt and consumer spending from any negative effect stemming from excessive indebtedness.

One way to isolate part of the way in which credit may affect spending is to include direct measures of credit supply in models of an empirical consumption function. Studies have found that some measures of willingness to lend and tightness of standards from the Federal Reserve's Senior Loan Officer Survey (SLOS) tend to work quite well in aggregate empirical models of spending and saving. For example, Carroll, Slacalek, and Sommer (2012) find that a model that includes household wealth, unemployment expectations and a credit supply measure derived from the SLOS series on banks' willingness to make installment loans can explain roughly 90 percent of the quarterly variation in the saving rate since the mid-1960s.

While including SLOS measures of credit supply in empirical aggregate consumption functions has shown promise and should be explored further, it is worth noting that this approach has its limitations. The SLOS series are derived from questions that ask about the direction in which terms, standards, and willingness to lend are moving but not about the magnitude of changes. Moreover, they reflect only trends at commercial banks, which may not be highly correlated with the behavior of other types of financial institutions from which households (particularly the most constrained) have traditionally sought credit. In addition, the approach does not capture weakness in consumption related to households choosing to save more in order to reduce their indebtedness.

An additional issue that warrants investigation is whether debt-related developments in recent years have changed the relationship between aggregate consumption and aggregate income. Recall that borrowing constraints can create heterogeneity across households in the way they respond to shocks to income—the spending of households that cannot borrow as much as they wish will tend to follow income more closely than that of other households. By increasing the share of borrowing-constrained households, high levels of debt and leverage, as well as banks' reluctance to lend, may have made aggregate consumption more sensitive to aggregate income. If so, the recent weakness in income may be having a larger-than-predicted effect on consumption.

### *Attitudes and preferences*

Broad measures of consumer confidence plunged as the economy slid into recession in late 2007 and have since retraced only about half of their decline. Households' views of their current situations remain very weak by historical standards. But, the expectations-related components of these measures have shown more of a recovery, suggesting that many households do believe the economy is on the mend.

Empirical models of aggregate consumption often include some aggregate measure of consumer confidence or expectations as an explanatory variable. Not surprisingly, movements in such measures tend to be highly correlated with (and presumably reflective of) movements in the other determinants of consumption included in such models like current income and wealth. However, even controlling for income and wealth, confidence measures have a statistically and economically significant effect on aggregate consumption, presumably because they also reflect developments not captured by the other variables such as expected future income and the uncertainty surrounding it (see Carroll, 1992).

The question at hand here is whether the different experiences of different households in recent years might be causing weak confidence to have an unusually large damping effect on consumer spending. This could be the case if higher-income households, who account for more consumer spending, are especially pessimistic. As can be seen in Figure 6, they do not appear to be so based on income-specific indexes of the expected change in unemployment (a confidence variable that is frequently used in aggregate empirical consumption function). But, a more thorough consideration of the issue would be interesting.

Going beyond issues related to heterogeneity, more thought is needed about whether the financial crisis and Great Recession have changed households' attitudes in some other way that has led to higher saving and, in turn, weaker consumer spending. An analysis of data from the 2007-2009 *Survey of Consumer Finances* panel suggested that the financial crisis left Americans with a desire to manage their resources more conservatively (Bricker, Bucks, Kennickell, Mach, and Moore, 2011). For example, households tended to report higher desired "precautionary" reserves than they did previously and also showed less willingness to take financial risk, particularly those that had lost a lot of wealth during the crisis.

## *Conclusion*

There are clearly reasons to think that differences in the behaviors and experiences of different types of households in recent years may have changed the relationship between aggregate consumer spending and other aggregate variables, rendering standard approaches to forecasting aggregate consumer spending less useful. This paper has provided an overview of possible issues related to various determinants of consumption, including income, wealth, debt-related issues, and attitudes. A more thorough investigation is needed in all of these areas, but the analysis here suggests that debt -related trends might be of particular concern, with high levels of indebtedness and leverage among some households both weighing on their spending generally and perhaps causing their spending to be more sensitive to income.

Careful reflection upon the events of recent years may suggest ways in which the models traditionally used for forecasting aggregate consumer spending can be improved. However, the lack of comparable historical episodes and deficiencies in the data available for estimating such models probably limit the scope for doing so. One lesson is that monetary policymakers should be attentive to complementary approaches to analyzing and projecting consumer spending. The issues highlighted here suggest that more analysis of household-level data (as well as taking steps to identify new data sources and to improve the timeliness of some existing data sources) would be fruitful.

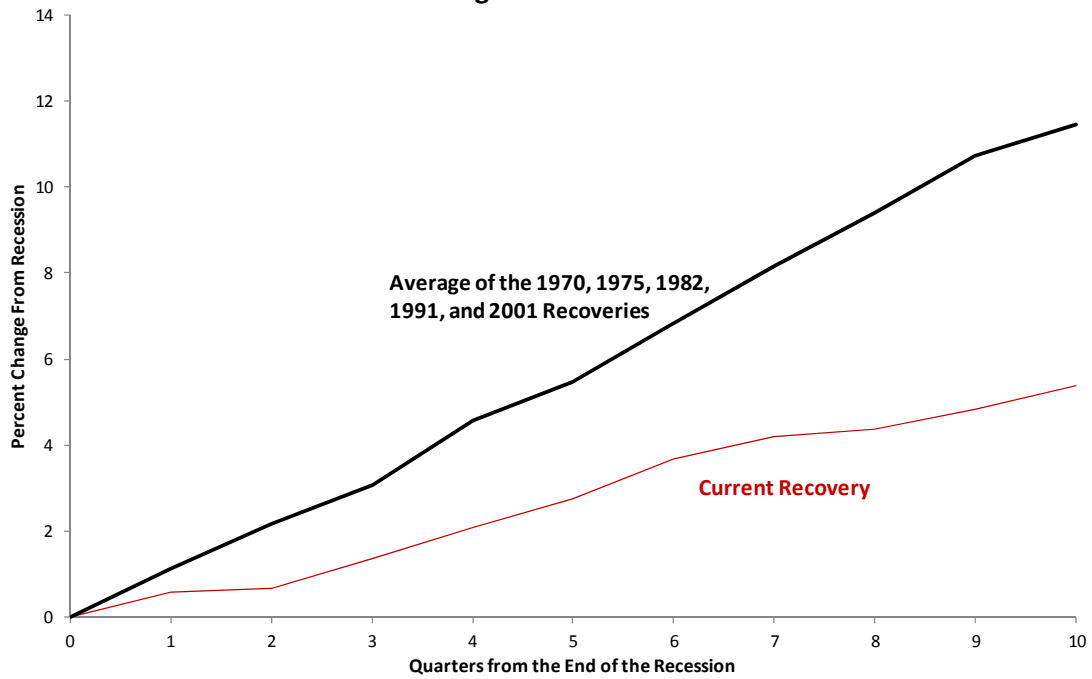
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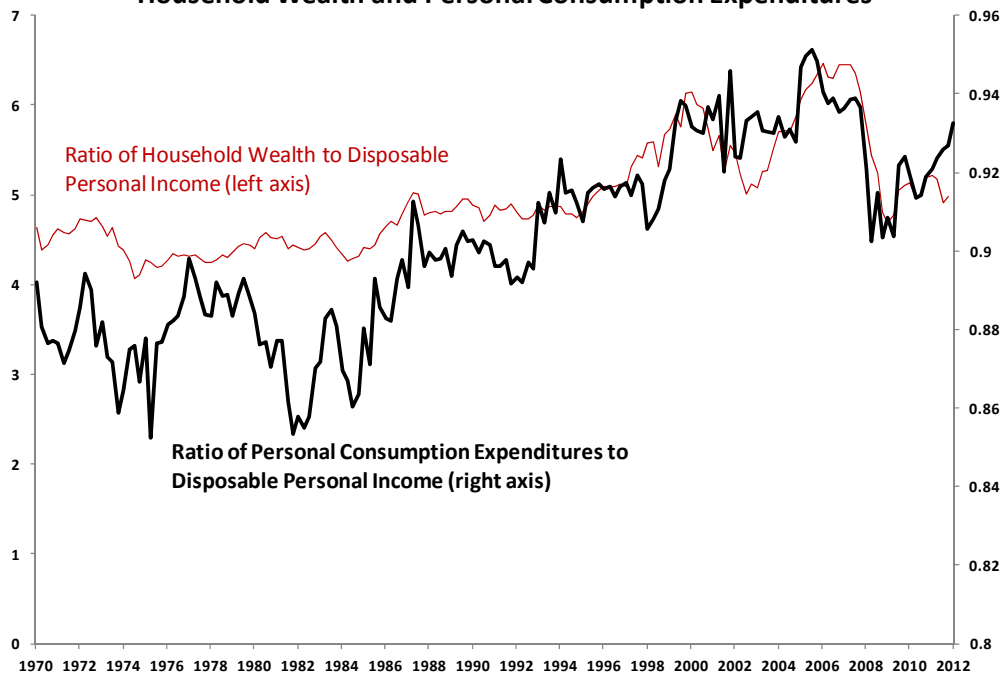


**Figure 1**  
**Real Personal Consumption Expenditures**  
**During Recoveries**



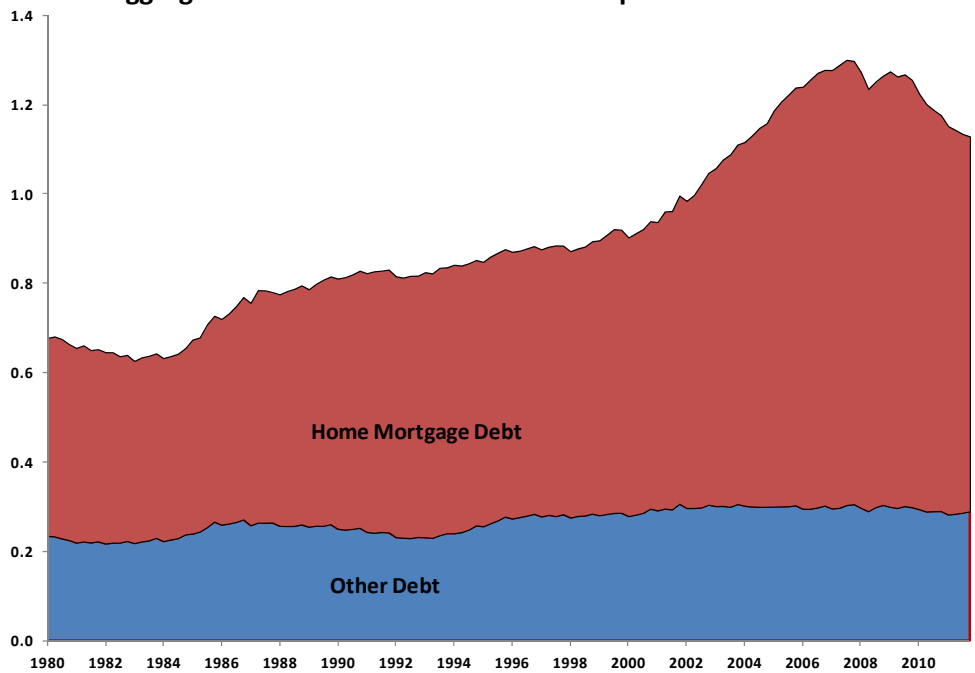
Source: Bureau of Economic Analysis and National Bureau of Economic Research

**Figure 2**  
**Household Wealth and Personal Consumption Expenditures**



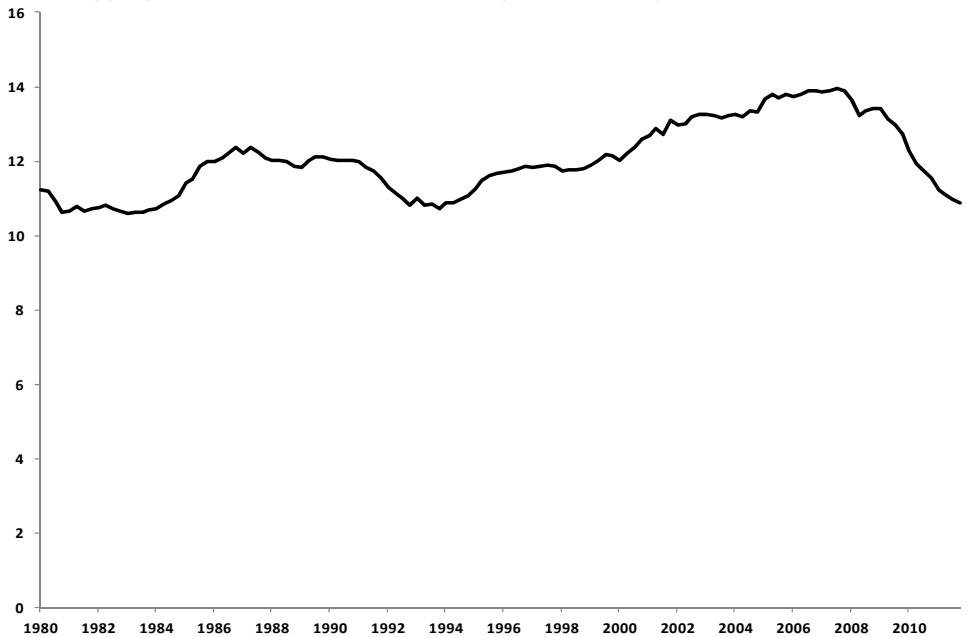
Source: Federal Reserve Board and Bureau of Economic Analysis

**Figure 3**  
**Aggregate Ratio of Household Debt to Disposable Personal Income**



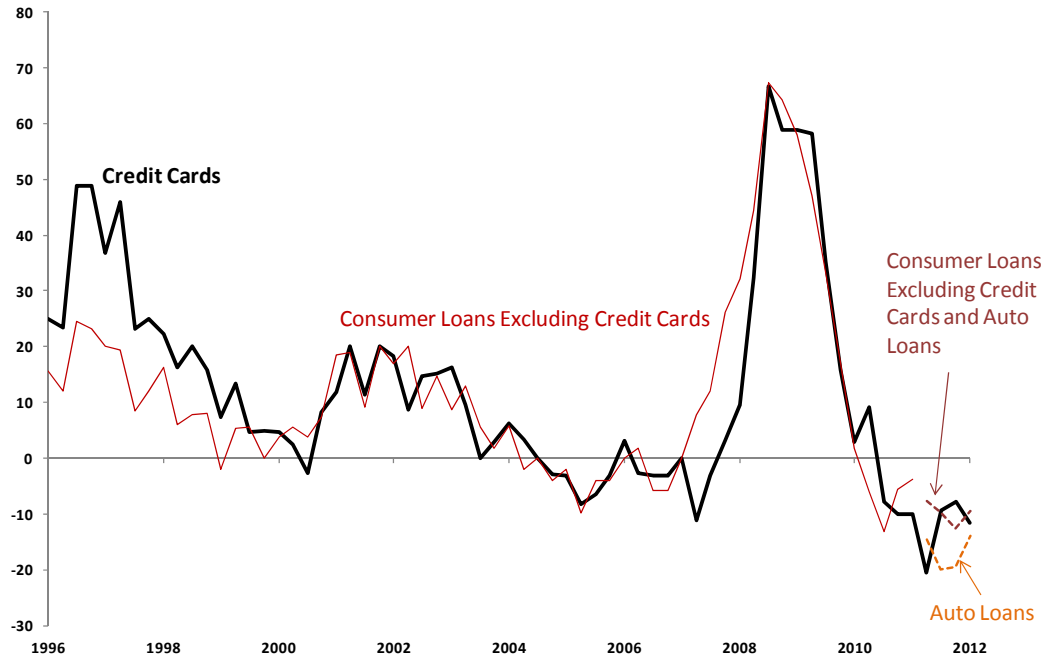
Source: Federal Reserve Board

**Figure 4**  
**Aggregate Ratio of Debt Service Obligations to Disposable Personal Income**



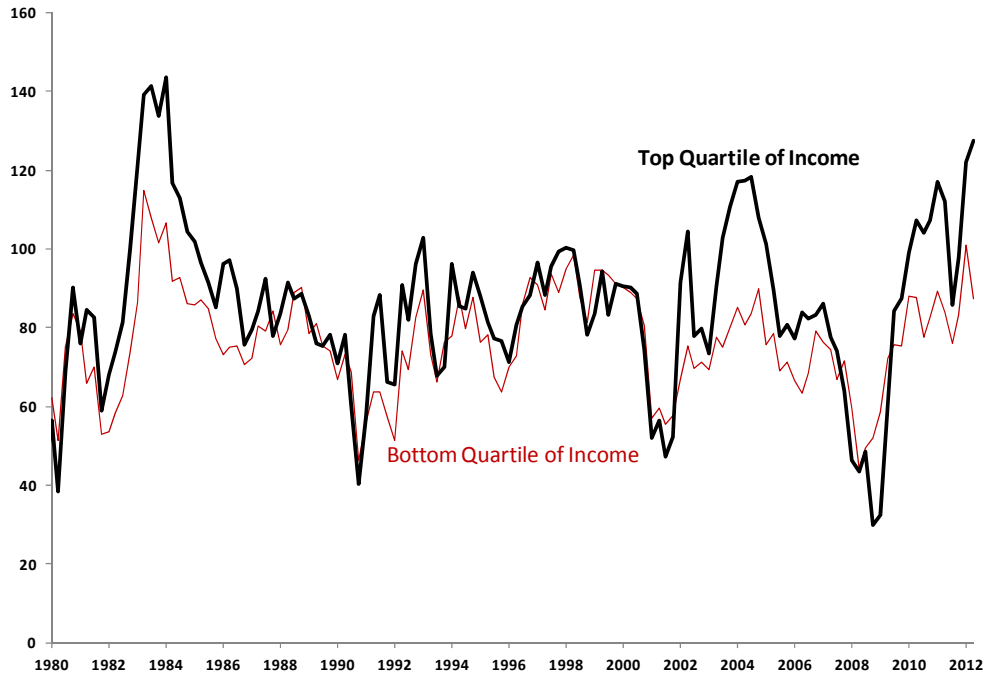
Source: Federal Reserve Board

**Figure 5**  
**Net Percentage of Banks Tightening Standards**



Source: Federal Reserve Board

**Figure 6**  
**Expected Change in Unemployment over the Coming Year**



Source: Reuters/University of Michigan Survey