

The Current State Of U.S. Household Balance Sheets

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Abstract

The Federal Reserve Board is responsible for two of the most widely-used data sets with information about U.S. household balance sheets, the quarterly macro-level Flow of Funds Accounts (FFA) and the triennial micro-level Survey of Consumer Finances (SCF). The FFA is very timely, but can only be used to describe the household sector as a whole. The SCF has the micro-level detail needed to capture heterogeneity in household finances, but the data is only available with a long lag. The key contribution in this paper is using the FFA and other macro data sources to “age” the micro-level SCF forward through time to generate a representative sample for current-quarter policy analysis. This aging approach is used to compare and contrast pre- and post-recession trends in key indicators such as net worth, debt to income, debt service to income, and housing loan to value across families grouped by characteristics including income, age, and geography.

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1. Introduction

Household sector balance sheets both contributed to and were dramatically affected by the Great Recession. The run-up in housing and stock prices in the years preceding the recession contributed to the strong growth in consumer spending and rapid pace of debt accumulation during that period, and thus helped to create a situation in which more households were more vulnerable to financial shocks.¹ The steep declines in house values and stock prices at the onset of the recession (along with rising unemployment and declining incomes) contributed to the substantial drop and subsequent anemic growth in consumer spending that has dominated macroeconomic activity for the past five years. One of the usual explanations for continuing spending restraint by consumers is the desire by at least some households to avoid going back to the vulnerable balance sheet situations they faced as the recession started.²

Clearly, understanding the most recent business cycle, and the slow pace of the ongoing recovery, requires an understanding of the evolution of household balance sheets. Unfortunately, the data sets available for studying household balance sheets all suffer from significant limitations across one or more dimension—such as representativeness, timeliness, the level of aggregation, the degree of longitudinal information, and the level of detail. These limitations impair our ability to track the evolution of household balance sheets over time in sufficient detail to identify important changes as they occur. In this paper, we circumvent this problem by combining existing data sources in order to track the evolution of household balance sheets in a way that is timely yet still captures important heterogeneity.

We focus on two widely-used data sources on household balance sheets, both of which are produced by the Federal Reserve Board—the Flow of Funds Accounts (FFA), which provide

¹ See, for example, Moore and Palumbo (2010).

² See, for example, De Nardi, French, and Benson (2012) and Petev, Pistaferri, and Eksten (2011).

quarterly estimates of the aggregate assets and liabilities held by the household sector, and the Survey of Consumer Finances (SCF), which provides a detailed triennial snapshot of the finances and balance sheets of a representative sample of U.S. households.³

These two data sources were developed for different purposes. The FFA provides a timely measure of the aggregate state of U.S. households, which is a key indicator for the macroeconomic outlook. The SCF provides a detailed look at the rich heterogeneity in household finances, which is critical for understanding the microeconomic underpinnings of macroeconomic activity. The FFA is available through the fourth quarter of 2012, but lacks micro-data on household balances sheets. The SCF provides rich micro-data for a point in time, but because it is costly and labor-intensive to produce, it is only available every three years, and with a two-year production lag (for example, the most recent survey is from 2010, which became available in 2012). The main idea of the project described in this paper is to combine the two data sets in an effort to create a timely dataset of detailed household-level balance-sheet information.

More generally, the goal of this paper is to explore a methodology for answering the following question: how can we use a combination of the SCF, the FFA, and other available macro data to more comprehensively describe the *current* state of household finances? As described in detail below, the central concept developed here can be described as “aging” the most recent SCF sample forward using the information available in the FFA and other macro-data sources. At the most basic level, each household record in the SCF can be updated each quarter by applying estimated changes in asset values using a local house-price index for house values and an equity-price index for corporate-equity values. As we show below, this simple

³ The FFA data are available for download at <http://www.federalreserve.gov/releases/z1>. Results of the most recent SCF are discussed in Bricker, Kennickell, Moore, and Sabelhaus (2012). SCF micro data are available for download or on-line tabulation and analysis at <http://www.federalreserve.gov/econresdata/scf/scfindex.htm>.

first step alone accounts for most of the change in household net worth since 2010, as measured in the FFA.

An important first step when integrating micro and macro data sources in this sort of simulation exercise is to reconcile the economic concepts and measurement used in the two data sets. As described below (and in Appendix 1), we make several adjustments to both the SCF and the FFA to put them on the same footing.

Once these adjustments are made, the evolution of household balance sheets is generally similar in both the SCF and the FFA. For example, both data sets show nearly identical levels and trends in the overall ratio of household debt to income. An interesting feature that merits further analysis is that asset values do not track quite as closely between the two data sets. In particular, the SCF and FFA show different rates of change in house prices in the period leading up to the Great Recession.⁴ But even for those statistics the overall patterns of change for this period are very similar.

The projections generate some intriguing results. Between 2010 and 2011 both house prices and stock prices were still falling, in the aggregate, causing household wealth to fall. At the end of 2011 stock prices began to rise fairly robustly, while house-price growth was much more moderate. This pattern led to gains in household net worth that were concentrated at the top of the wealth distribution. As house prices continued to grow through 2012, household balance sheets began to improve across the distribution, and the share of households with key financial ratios (such as LTV) exhibiting high degrees of distress began to fall. Thus, the projection suggests that important improvements in the balance sheet positions of many

⁴ See Henriques and Hsu (2012) for a more comprehensive discussion of reconciling SCF and FFA net worth measures.

households are occurring now, though elevated debt levels associated with the housing boom are still widespread.

2. Measuring Household Wealth in the FFA and the SCF

As noted above, the FFA and the SCF were developed for different purposes, and do not measure household balance sheets the same way. As a result, we need to conform the concepts of household assets and liabilities across the datasets before combining the information. Because our general approach is to start with the 2010 SCF and age it forward, we adjust the FFA data to make it more conceptually similar to the SCF.⁵

The first step is to align the concept of “household.” In the FFA, the household sector is estimated residually—that is, household holdings of each asset category are estimated as the total outstanding less holdings of the other sectors (businesses, governments, financial institutions, and foreign holders). This strategy is required because there are no comprehensive administrative data sources on aggregate household assets and liabilities. Because we also lack comprehensive administrative data sources on other parts of the economy—in particular nonprofit organizations, hedge funds, and other private pools of assets—these other actors are also included in the FFA’s household sector by default. However, we are able to measure certain components, such as the real estate holdings of nonprofit organizations. So, our first step is to remove these holdings from the FFA’s household sector.

A second conforming adjustment is related to institutional holdings of assets on behalf of households. The two most important examples are assets held by defined benefit (DB) pension funds and life insurance companies to back promises of future payments to households. These assets (or more precisely, the promises they back) can thus reasonably be considered part of

⁵ See Appendix 1 for more details.

household net worth, and are included in the FFA concept of household wealth.⁶ However, it is difficult to measure the value of these promises accurately in the SCF. The SCF has some questions about pension coverage and DB income expectations, but a comprehensive calculation of the value of these pension claims is beyond the scope of this paper.⁷ Thus, we exclude this source of wealth from the FFA measure of net worth in order to achieve greater comparability between the data sources. On net, these adjustments lower FFA net worth by about 21 percent in 2012.

We make similar types of conceptual adjustments to another macro data source that we use to measure changes in aggregate income—the National Income and Product Accounts (NIPA). NIPA personal income is based on a very broad concept that includes “in kind” payments that many households typically do not consider to be income and that are not collected in the SCF. Examples include fringe benefits such as employer-provided health insurance and employer pension contributions, and government-provided health care such as Medicare and Medicaid. Removing these from NIPA income reduces the aggregate income estimate by about 8 percent in 2012.⁸

Even after making these conceptual adjustments to the macro and micro data sources, measurement differences remain. For example, aggregated total net worth in the SCF is approximately 125 percent of the adjusted FFA net worth measure in 2010, primarily because reported house values rose faster in the SCF than in the FFA during the housing boom leading up to the Great Recession.

⁶ The same logic can be applied for other promises of future payment to households, such as Social Security benefits or Medicare. These promises are not included in the FFA concept of household wealth, in part because they are not backed by marketable financial assets.

⁷ See Love, McNair and Smith (2008) for a calculation of the value of households’ claims on pension and life insurance providers using the Health and Retirement Survey.

⁸ One important area for future work is further reconciliation of SCF and NIPA incomes, especially with respect to imputed income on owner occupied housing and pension flows. See Appendix 1 for details.

3. Trends in Aggregate Measures of Household Balance Sheets

The conceptual adjustments made to FFA wealth and NIPA income concepts do not affect what are by now some very well-known stories about trends in household sector net worth over the past few decades. Looking back to 1995, household sector net worth experienced two distinct boom and bust periods (Figure 1). The first boom and bust was largely associated with the 1990s stock market bubble, while the second involved run-ups and steep drops in both the stock market and housing values in the 2000s. Because the second period involved housing, it affected a much wider swath of families, and the unprecedented widespread drop in housing values was a key contributor to the Great Recession. Household sector net worth has rebounded somewhat since the depths reached in early 2009, as both stock prices and housing prices have (at least partially) recovered.

One legacy of the housing boom is an elevated level of household debt. In the aggregate data, the overall ratio of household debt to disposable income was steady at just under 100 percent between 1995 through 2001, before surging to nearly 150 percent by 2010 (Figure 2). Although mortgage debt and other types of consumer debt (vehicle loans, credit cards, education debt, other consumer loans) all increased in the years preceding the Great Recession, mortgage debt accounted for about 90 percent of the total household debt increase between 2001 and 2010. The levels of mortgage debt have since fallen (and incomes have since risen), but the large run-up in the aggregate debt to income ratio is far from gone. As of 2012q3, aggregate household sector debt remained at about 125 percent of aggregate household sector disposable income.⁹

⁹ For a more comprehensive discussion of recent trends and current levels of household debt, see Brown, Haughwout, Lee, and van der Klaauw (2011).

Figure 3 shows that despite the relatively high aggregate debt to income ratio, debt *payments* relative to income have fallen as interest rates have fallen. Indeed, this ratio has returned to (and even fallen below) debt service ratios observed in the late 1990s.¹⁰

Trends in housing debt and housing values together generate one of the most widely-discussed statistics used to characterize the current state of U.S. household aggregate balance sheets, the total loan-to-value (LTV) ratio. As shown in Figure 4, the aggregate housing LTV ratio was little changed during the decade preceding the Great Recession—hovering around 40 percent—as the surge in house values that occurred year after year was matched by a surge in mortgage borrowing. When house values collapsed beginning in 2006 the aggregate LTV jumped to over 60 percent, even as net mortgage borrowing ground to a virtual halt.

Aggregate mortgage debt outstanding has fallen since 2007 due to a steep decline in purchase originations, tighter credit standards, falling prices, and chargeoffs. This has had a meaningful effect on aggregate LTV ratios, but the sharp drop in the ratio in 2012 as house prices began to rise illustrates how important house values are in determining the high frequency movements in the overall LTV ratio. While an aggregate LTV of 55 percent may not appear to be particularly alarming—that is, the average homeowner may not be in a precarious position—we are also interested in the distribution of LTVs, and especially the incidence of very high LTVs. For this, we need micro data such as the SCF.

¹⁰ These debt service ratios are available on the Federal Reserve Board website; see Dynan, Johnson, and Pence (2003) for details. In computing this ratio, we adjust the definition of income in the denominator to be SCF-consistent, as described above. Note that this ratio can also fall due to lengthening average amortization periods, e.g., if there is a compositional shift toward longer-term loans.

4. “Aging” Household Balance Sheets Forward Through Time

Household-level data are critical for understanding heterogeneity in household balance sheets and tracking metrics such as the share of households with high loan-to-value or debt-service-to-income ratios. But as noted above, the painstaking process of collecting reliable micro-data means that the SCF is only available every three years, and there is a two-year lag between fielding the survey and releasing the data. In other words, the SCF is a critical tool but not a particularly timely one. The purpose of the project described here is to estimate a *current* sample of household balance sheets by “aging” the most recent SCF micro data forward to the current quarter, household by household. The aging process involves updating prices for equity holdings and house values, growing incomes, and using two alternative trajectories for household debt. There are no adjustments for other new saving or borrowing.

The first step in our approach is to update each household’s asset valuations using indexes for house prices and stock prices. Real estate values are adjusted proportionally using CoreLogic house-price indexes at the level of the Core Based Statistical Area (CBSA) that matches each household’s geographic location. The geographic detail available in this index is quite extensive, with close to 1,000 distinct geographic areas represented across the U.S. Real-estate values for unincorporated businesses are adjusted proportionally using the percent change in non-corporate equity asset revaluations in the FFA. Finally, the values of corporate equities (both inside and outside retirement accounts) are grown proportionally with corporate equity values from the Dow Jones Total Market Index.¹¹ These adjustments to asset values are only estimates—in reality, each household will experience its own unique change in asset values. But the price indexes we apply should capture the average movement of asset values since the most recent SCF.

¹¹ As noted, at this stage we are not accounting for any new saving flows.

Since 2010, these asset-price changes alone are sufficient to capture most of the movement in aggregate net worth. Overall FFA net worth (adjusted for SCF consistency, as described above) rose by 13.9 percent between 2010 and 2012, and the applying the housing, corporate equity, and non-corporate equity revaluations described above to the 2010 SCF raises the sample's aggregate net worth by 11.0 percent.

The second step we take to age the 2010 SCF is to update household incomes. We grow each household's income proportionally with the growth in aggregate NIPA income, component by component. For example, a 10-percent increase in aggregate wage income would be applied to the wages of each SCF household with wage income in 2010. We grow each component of income separately—for example, Social Security and pension income are grown separately from wages—in order to preserve the heterogeneity in income growth for households with different compositions of income. For example, younger and more-moderate-income households are more likely to receive most of their income from wages, while older families are more likely to receive less volatile Social Security and pension income. Again, this simple approach of giving each household the aggregate growth rate produces only a rough estimate of each household's actual income growth, and could miss key correlations affecting particular population subgroups. For example, if the households that took on the highest amounts of debt leading up to the Great Recession were also the ones who experienced the slowest income growth since 2010, our aging procedure might overstate the improvement in households' financial situations.¹²

The third step we take to age each record is to update household debt. At this stage, we have modeled two alternative assumptions governing the evolution of household debt since

¹² A more realistic simulation methodology could bring to bear the insights and data being used in studies of permanent and transitory income changes over time. See, in particular, Carroll (1992), DeBacker, Heim, Panousi, Vidangos (2011), Guvenen, Ozkan, and Song (2012), and Sabelhaus and Song (2009, 2010). Ackerman and Sabelhaus (2012) show how the difference between actual and “normal” income measure in the SCF relates to the traditional distinction between transitory and permanent income shocks.

2010. Neither scenario is meant to be a realistic prediction of the actual evolution of household debt, but together they help frame the role of debt on household balance sheets.

The first debt scenario we apply assumes that families offset any principal pay-down since 2010 with new borrowing, so that overall (nominal) debt is held constant. In this scenario, the changes in balance-sheet measures such as the debt-to-income ratio and the debt-service-to-income ratio after 2010 reflect only improvements in income, driven by the proportional growth using NIPA aggregates. Similarly, the evolution of ratios involving asset prices—in particular, housing LTVs—is determined only by the house value itself. Although very simplistic, this constant-debt scenario does help illustrate how factors other than debt growth itself can generate improvement in key measures of household finances. In particular, the threshold-type statistics will show disproportional improvement if many families are just above the threshold in 2010, and thus even modest income or house price growth is enough to bring them down below the cutoff.

The second debt scenario uses the 2010 SCF's very detailed information about the loan terms and payment behavior of each household to model the effect of principal pay-down at the rates observed in 2010. That is, we project forward each household's principal balances, assuming the household continues making the observed loan payments on schedule.¹³ An important feature of this scenario is that it assumes that households take on no new debt, which is of course not realistic—since 2010, many households have originated new mortgages or refinanced existing ones, or added new credit-card, student-loan or auto debt. Nonetheless, this

¹³ The SCF has information on up to 42 distinct loans across several different types of debt, of which most are installment type loans, for which typical or scheduled payments, interest rate, term, and origination are known. Some loans—most notably education loans—have additional information about payment behavior, in particular, whether the loan is currently in deferral. See Appendix 3 for details.

scenario offers a useful interpretation, by measuring what would have happened to each household's balance sheet if all the new debt acquisition had occurred among other households.

If every SCF household paid down its debt according to the 2010 terms, and no new debt were taken out, aggregate debt in the SCF would have fallen about 8 percent between 2010 and 2012. In the FFA, aggregate household sector debt fell about 2 percent over this time period. Thus, the assumption of principal pay-down with no new debt clearly overstates debt pay-down in the aggregate. Interestingly, however, this “miss” appears to be entirely concentrated in consumer (that is, non-mortgage) debt. Mortgage debt, which is the lion's share of household debt, fell about 6.1 percent in the FFA over this period, while consumer debt rose substantially. The FFAs does not break down consumer debt into its components, but other sources, such as credit-bureau data, suggest that education debt rose more than 30 percent, vehicle debt rose about 17 percent, and other consumer installment debt rose about 2 percent.¹⁴

Applying the “principal pay-down” scenario to mortgage debt in the SCF results in a 5.9 percent aggregate reduction in SCF mortgage debt—quite close to the 6.1 percent reduction observed in the FFA. This finding suggests that un-modeled mortgage-related transactions such as cash-in refinancing, charge-offs, and net new mortgage debt acquisition cancel out in the aggregate over this time period. Indeed, since many households did not engage in these un-modeled transactions, the principal pay-down scenario is likely a reasonably accurate forecast for many of the households that stayed in their 2010 homes. On the other hand, this scenario clearly misses the rapid growth in consumer debt—especially education debt and auto lending—we have seen in the aggregate data since 2010.

¹⁴ Authors' calculations, using Equifax aggregates calibrated so total non-mortgage consumer debt matches the non-mortgage consumer debt totals in the FFA.

5. The Current State of U.S. Household Balance Sheets

In this section we analyze the balance sheets of the “aged” SCF sample, as of the third quarter of 2012 (which was the most recent quarter of FFA and NIPA data at the time of our analysis). It is well known that the Great Recession had a dramatic impact on household balance sheets, with direct effects from relative price shocks on homeowners and households that owned corporate equities, and indirect impacts for many households because of unemployment and other income shocks (Bricker, et al, 2012; Mian, Rao, and Sufi, 2011).¹⁵ The 2010 SCF provides a snapshot of household finances in the period immediately following the recession. The goal of creating an “aged” SCF is to get some sense of how balance sheets have evolved since 2010, so we can get a more timely estimate of the types of disaggregated statistics we can calculate from the SCF data.

The advantage of a very rich micro data set like the SCF is that it provides many interesting ways to tabulate the data and gain additional perspective on trends in household finances. The focus of the micro analysis in this section is on the distribution of the same four measures of household balance-sheet positions considered above using the aggregate statistics—that is, net worth relative to income, overall debt relative to income, debt service relative to income, and housing loan-to-value ratios (LTVs). These measures can be tabulated in different ways when using micro data. For example, one can report means by group, and thus compare and contrast outcomes for various population subsets against the aggregate or other groups. Alternatively, one can report the fraction of families for whom the statistic of interest exceeds

¹⁵ For a more dynamic perspective on the effects of the Great Recession on household finances, see Bricker, Bucks, Kennickell, Mach, and Moore (2011). Also, Moore and Palumbo (2010) compare and contrast the distribution of household finances across the three economic downturns that have occurred since the current version of the SCF was initiated in 1989.

some critical threshold (for example, LTV>95 percent). Both means and threshold-type statistics might be important for predicting changes in economic behavior over time.

The amount of data that can be generated from this sort of micro analysis quickly expands when one introduces a third dimension for tabulating outcomes, such as decomposition by type of household. In this analysis we tabulate various outcomes by permanent (or “normal”) income, by age (<45, 45-64, and 65+), and by geography (the four so-called “sand” states versus all others).¹⁶ With these parsimonious choices, we have four measures of household financial position, two possible outcome variables for each (means and share exceeding a threshold value), and three ways of grouping households (by normal income, by age, and by geography), for each of six historical SCF samples (triennially from 1995 to 2010), plus eight projection quarters representing 2010q4 through 2012q3. In addition, we have the two alternative scenarios for projecting debt balances. Because all this results in so much potential data output, we restrict the presentation to a few tables and charts that highlight some noteworthy aspects of pre- and post-recession trends in household finances.

A natural starting point for analyzing household finances in the past few years is the dramatic collapse in wealth that occurred between 2007 and 2010. As shown in Table 1, the overall decline in mean net worth was 15 percent, and the decline was widespread across households grouped by normal income. Every group experienced some decline, but proportionally the first, third, and fourth quintiles were somewhat harder hit. Note, however,

¹⁶ The concept of “normal” income in the SCF is conceptually and empirically close to the concept of “permanent” income that economists generally have in mind when describing consumer behavior. The label “normal” derives from the fact that SCF respondents are asked, after they report their actual income, whether this is a “normal” year. If they say this is not a normal year, they are asked to report a value for “normal” income. For most families actual and normal income are the same, but Ackerman and Sabelhaus (2012) show that the deviations from normal for the subset who report such deviations provides a relationship between actual and permanent income that is consistent with estimates of transitory shocks using panel income data.

that the top decile of households in terms of normal income experienced a 13 percent real wealth decline between 2007 and 2010, which was roughly in line with the overall average decline.

What does the rudimentary “aging” experiment suggest about changes in mean wealth across income groups since 2010? In the simplest case in which debt is held constant and only asset prices evolve, the projection suggests continued widespread wealth declines in 2011, but then net gains (relative to the 2010q3 starting point) in 2012 (Table 2). The reason is straightforward: stock prices were volatile and house prices generally fell a bit in 2011, while both stock and house prices rose after 2011q3.

One goal of aging the SCF sample is to evaluate the distribution of wealth change across groups since 2010. Note that wealth losses were relatively larger for the lower normal income groups through 2011, which reflects the way in which the various assets are distributed across those groups, as well as the relative price changes. The gains in wealth due to price changes were concentrated at the top of the normal income distribution, because those groups own a disproportionate share of all assets, especially the corporate and non-corporate equities which increased the most in value. However, it is important to keep in mind the limitations of these projections: in addition to only showing the effects of price changes for these selected assets, there are real changes in other types of assets and debt (for example, new saving and debt reduction) that are not being captured in these calculations.

How different would these conclusions be under the principal pay-down assumption described above? As noted, if every household in the SCF paid down principal using their 2010 loan terms without taking out new debt, total household debt would have fallen about 8 percent (while in the FFA, household sector debt fell 2 percent over this period). But even the “thought experiment” of the 8-percent reduction in debt would have only a small effect on household net

worth, pushing up the net increase in real net worth for the 2010q3 to 2012q3 time period from 5 percent to 6 percent (Table 3). Thus, even this sort of debt pay-down scenario would not fundamentally alter the distribution of wealth change across income groups. Lower-income groups would get slightly more of the net gains in wealth since 2010, because debt is relatively more important on their balance sheets. But the fundamental story from Table 2, that the improvements we have seen since 2010 driven by asset price changes are concentrated at the top of the income distribution, would be unchanged even in the debt-pay-down scenario.

When looking at the debt-to-income ratio by age, income, or geographic group in the SCF, we calculate the ratio as the average debt of the group relative to the average income of the group, rather than average of the group's ratios.¹⁷ Figure 5 illustrates the trends in the debt-to-income ratio by normal-income group in both the historical (triennial) SCF surveys (to the left of the vertical line) and in each of the projection quarters (to the right of the line). The quarterly projection is shown for both the constant-debt scenario and the principal pay-down scenario. As shown in Figure 5, we see that the run-up of the debt-to-income ratio between 1995 and 2010 was widespread across normal-income groups, and that this ratio remains elevated for all groups through 2012q3 even under the principal pay-down scenario. We find that the debt-to-income ratio is highest for the middle normal-income group. Homeownership rates and thus mortgage debt rise with income; nonetheless, households at the top of the income distribution tend to have less debt relative to income than do middle-income households. These differences by income hold at all points in time, and the relative debt-to-income ratios have not changed much, which suggests that the growth of debt (relative to income) over the last decade was not concentrated in any one part of the income distribution.

¹⁷ This approach is used in order to minimize the influence of households with special circumstances that result in unusually large or small ratios.

The same basic story about trends in debt relative to income holds when we look across age groups. As shown in Figure 6, debt-to-income ratios are lower among older age brackets at every point in time. This is not especially surprising, because the typical life-cycle pattern of borrowing for housing and other investments exhibits higher borrowing at younger ages. However, as with income, the growth in the debt-to-income ratio from 1995 to 2010 can be seen across age groups, and in fact is steepest in relative terms for the 65-and-older age group. Even under the principal pay-down scenario with no new debt after 2010, we do not see a substantial reversal of the run-up in the debt-to-income ratio that occurred from 1995 to 2010 for any of the three age groups.

Next we examine the evolution of the debt-service-to-income ratio, which is arguably even more important for measuring households' financial stress from leverage. For this analysis, rather than focus on the ratio itself, we measure the share of households with regular monthly payments in excess of 40 percent of their disposable income. This threshold is arbitrary, but is intended to indicate potentially risky levels of leverage.¹⁸ We find that this indicator of household financial stress is highest in the middle of the normal-income distribution, at nearly 15 percent of households in 2010 (Figure 7). During the boom, this indicator spiked among the highest normal-income households, while it fell back a bit among the lowest normal-income group. Unlike the previous chart, for this indicator we do find a significant decline after 2010 under the principal pay-down scenario, especially for middle-income households. Under the constant-debt scenario, however, we see little change after 2010.

Looking at this indicator by age (Figure 8), we see that the share of households with high debt-service ratios is roughly similar for households under 45 and those aged 45-64, and

¹⁸ Recent regulations promulgated by the Consumer Financial Protection Bureau use a similarly defined threshold of 43% in the context of regulating "qualified mortgages."

significantly lower for those over age 65. Again we see a significant decline in this indicator after 2010 under the principal pay-down scenario and little change under the constant-debt scenario. This difference could be due in part to the role of shorter-amortization loans such as car payments. Under the principal pay-down scenario, such loans are being retired at a high rate, resulting in a dramatic drop in the share of households with high debt service relative to income.

The final set of charts provides several perspectives on housing debt relative to housing values, or LTV. Again we focus on an indicator of high LTV rather than the LTV itself, since homeowners with high LTVs are often of particular interest with regard to financial stability (for example, they are most likely to default on their mortgages). In this analysis we define “high-LTV” as having a mortgage balance in excess of 95 percent of the household’s reported market value of their home.¹⁹

As shown in Figure 9, the fraction of mortgage-holding households with high LTVs jumped dramatically in 2010 for all normal-income groups, but especially for the middle-income group, for whom it surpassed 20 percent. Since then, this indicator has trended down for all groups in 2012 as house prices have risen. Comparing the two debt-pay-down scenarios after 2010, we again see little change under the constant-debt scenario, and a more significant decline under the principal pay-down scenario—especially for the lower-income households—though the indicator remains elevated relative to 2007. Recall that, in contrast to consumer debt, mortgage debt under our principal pay-down scenario tracks observed changes in aggregate mortgage debt in the FFA quite closely, so in this case we believe that the patterns shown here

¹⁹ Because this measure of LTV relies on homeowners’ self-reports of the home’s market value, it may differ somewhat from other measures of LTV. For example, the 2010 SCF shows a spike in the share of homeowners reporting their house is worth exactly what they owe on it. Because our indicator is intended to identify a group of people who have no real equity to lose by walking away, we include these homeowners in the indicator of high LTV.

for the principal pay-down scenario may not be a bad estimate of actual developments after 2010.

Figure 10 shows the trends in the high-LTV indicator by age, and here we see an even sharper pattern than we saw by income. Again, all three groups saw a spike in the high-LTV indicator between 2007 and 2010, but by far the largest spike occurred in the youngest age group—which includes many first-time homebuyers who were more likely to buy near the peak of the market. For this age group, the high-LTV indicator reached nearly 30 percent in 2010, while among households over 65, it never exceeded 10 percent. Again we see a downward trend for all ages in 2012 as house prices rose, and again a more significant reduction under the principal pay-down scenario, especially for the youngest age group.

Finally, we show the evolution of the high-LTV indicator by geography, splitting the sample into the “sand states”—Florida, Arizona, Nevada, and California—versus the other states, in order to illustrate the larger boom-and-bust cycle in the sand states. As shown in Figure 11, households in the sand states experienced a much larger spike in the high-LTV indicator in 2010 than did the other households—though by no means was the spike limited to just the sand states. Sand-state households have also experienced a much larger decline in this indicator in 2012, especially under the principal pay-down scenario.

6. Conclusions

In this exercise, we have attempted to estimate a “current SCF” by projecting forward each household in the 2010 survey using aggregate information from the Flow of Funds Accounts and other macro data sources. The simple exercise here produces some key insights about the extent to which changes in household finances after 2010 have reversed some of the trends that occurred leading up to and through the Great Recession. For example, real wealth losses between 2007 and 2010 were widespread across age and income groups, and those losses continued through 2011, before asset prices began to recover. Equity prices began to rise in late 2011, and real estate prices began to follow in early 2012. However, the gains were not equal across groups, particularly by income, because the real wealth gains attributable to house and equity prices after 2010 have been concentrated at the top of the distribution.

In addition to rising asset prices, steadily rising incomes have improved key household financial ratios such as the debt-to-income ratio since 2010, though the effect has not been large enough to reverse the sharp run-up in these ratios over the last decade. We find that the increase in debt was widespread across all the age and income groups we consider, and that debt-to-income ratios remain high through 2012 even under the assumption that households continued to pay down debt on terms observed in 2010 and no new debt has been taken out since then. Looking at the share of households with debt-service-to-income ratios above 40 percent, however, we find that there would be a fairly significant drop-off in the fraction of households above this threshold after 2010 under the assumption of continued debt pay-down with no new debt. However, we know from other sources that consumer debt—especially education and auto loans—have grown sharply after 2010.

One oft-cited statistic on household finances is the dramatic increase in housing LTVs that occurred when the housing market collapsed after 2007. We find that the share of households with self-reported LTVs over 95 percent rose from about just under 7 percent in 2007 to nearly 20 percent in 2010. This spike in the incidence of high LTVs was widespread across age and income groups, and observed in both the so-called “sand states” and in other states (though much larger in the sand states). Again we find that there would be a fairly significant reduction in the share of households with high LTVs under the assumption of continued debt pay-down since 2010 with no new debt. Unlike in the case of consumer debt, for housing debt this assumption might not be so far from the truth, as originations of mortgages for purchases remain very low by historical standards. Despite the possible drop-off since 2010, however, we find that even under the principal pay-down scenario the share of households with high LTVs remains elevated relative to 2007.

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Appendix 1: Reconciling SCF with Aggregate Published Income and Wealth Measures

The concept of personal income in the National Income and Product Accounts (NIPA) includes imputed incomes for which no comparable cash flow measure exists, as well as unmeasured or poorly-measured (at the household level) income sources such as fringe benefits and in-kind transfers. The concept of net worth in the Flow of Funds Accounts (FFA) includes assets and liabilities of non-profit organizations, as well as holdings through institutional arrangements such as defined-benefit pensions which are not adequately measured at the household level. This Appendix describes the adjustments made to aggregate income and wealth measures aimed at achieving improved conceptual consistency with the SCF.

The NIPA concept of personal income is broken down into source components in Table 2.1. Personal income is the broadest measure of income received by the household sector. In order to achieve comparability with the measure of income in the SCF, we exclude supplements to wages and salaries (line 6), Medicare and Medicaid transfers (lines 19 and 20), and other current transfers from business (net) (line 24). This reduces personal income by about 8 percent in 2012. On the SCF side, we begin with the standard “Bulletin” income variable, which is the family’s reported total income for the year preceding the survey. However, we replace that measure with the sum of the reported income *components* (wages and salaries, business income, interest, dividends, capital gains, transfers, retirement income) in cases where the sum of the components exceeds the reported total. There are several remaining conceptual issues to be addressed in order to completely reconcile incomes: the NIPA includes items not reported on the SCF, such as imputed rent on owner occupied housing and interest and dividends paid indirectly to households (mostly pensions), while the SCF measure includes items not in the NIPA concept, such as withdrawals from pension plans. On net, the discrepancies roughly cancel out, and the SCF measure is close to 90 percent of the adjusted NIPA measure.

The FFA net worth concept reported in Table B.100 diverges conceptually from the SCF measure in two broad ways. First, the FFA household sector includes non-profit institutions. The most prominent impact of non-profits is through their holdings of real estate (Line 5) and plant and equipment (Line 6). Removing those assets lowers FFA household sector net worth by about 4 percent in 2012. The second set of (and larger) adjustments to FFA household sector net worth are associated with assets held on behalf of households by other institutions, in particular, defined benefit pension funds and life insurance companies. Holdings of private sector defined benefit pensions (Table L.116.b), federal employee (other than TSP) pension assets (Table L.118 line 7), and state and local employee pension assets (Table L.117) together account for about two-thirds of pension assets on Table B.100 line 28, but these are not measured at the household level in the SCF, and excluding those lowers net worth by almost 15 percent. Likewise, holdings of life insurance companies are excluded, because those assets are mostly policy reserves (that is, not whole life). Excluding life insurance on B.100 line 27 reduces net worth by approximately 2 percent or so. Finally, there are a number of asset and liability categories (B.100 lines 26, 30, 35, 36, 37, 38, 39, 40, and 41) that are either associated with non-profits or not well measured at the household level; these basically net out and reduce reported net worth by less than 1 percent. Together, all of the adjustments for SCF consistency reduce FFA net worth by just over 21 percent in 2012.

Appendix 2: Geographic Locators for Assigning House Price Changes

One of the crucial building blocks for aging the SCF micro sample forward through time is assigning local area house price changes to individual observations. This Appendix describes how specific price indexes were used to project changes in house prices.

Each observation in the SCF includes a numeric geographic locator variable derived from that household's Core Based Statistical Area (CBSA). In the event that the CBSA could not be identified or matched to a corresponding local housing price index, we use the household's state of residence as a geographic identifier. According to the Census bureau, "the term CBSA is a collective term for both metro and micro areas. A metro area contains a core urban area of 50,000 or more population, and a micro area contains an urban core of at least 10,000 (but less than 50,000) population. Each metro or micro area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core."²⁰ Current CBSA delineations were last revised in September 2010; new delineations based on the 2010 Office of Management and Budget (OMB) standards²¹ will be released by OMB in 2013. There are 960 distinct CBSAs under current definitions.

The process of mapping households to unique geographic locators unfolded over several steps. We first assigned SCF households to their corresponding CBSA by using the Department of Housing and Urban Development's zip code-to-CBSA crosswalk.²² Of the 142,460 observations between the 1995 and 2010 surveys, 134,800 (94.6 percent) mapped to a CBSA that could be matched to a location represented in CoreLogic's CBSA-level home price index (HPI). Over two-thirds (5,270) of the 7,660 observations that could not be matched to CoreLogic's HPI were located in zip codes that are not located within a CBSA (i.e. rural). The remaining 2,390 observations (less than 1.7 percent of the SCF sample between 1995 and 2010) were located within a CBSA not sampled by CoreLogic. Such a proportion is consistent with the coverage of CoreLogic's HPI, which represents about 98.5 percent of US zip codes. The 7,660 observations that could not be matched to CoreLogic's CBSA data were therefore assigned their corresponding state-level CoreLogic HPI.

²⁰ <http://www.census.gov/population/metro/>

²¹ http://www.whitehouse.gov/sites/default/files/omb/assets/fedreg_2010/06282010_metro_standards-Complete.pdf

²² http://www.huduser.org/portal/datasets/usps_crosswalk.html

Appendix 3: Details about Loans, Loan Terms, and Debt Service in the SCF

The SCF collects data on thirteen categories of loans that can in principle be used to measure household debt service. Those categories include loans on cars and trucks for personal use, other owned vehicle loans, education loans, other consumer loans, home improvement loans, primary mortgages, other residential real estate loans, loans against land contracts given by the respondent household, margin loans, loans against life insurance policies, pension loans, credit cards, and lines of credit. In this paper we map the various types of loans into the five household debt categories that are reconciled with FFA and other aggregate data sources and tracked as part of household net worth. Those five categories are mortgages, education loans, credit cards, vehicle loans, and other consumer loans. In order to maintain consistency between loans and (gross versus net) debt balances we drop loans on land contracts, margin loans, life insurance loans, and pension loans from what follows.

Each loan in the SCF is identified in two ways: by type and by purpose. Loan type describes where the loan is recorded in the SCF and differentiates, for example, a household's first consumer loan from its second consumer loan. The 42 loan types can be assigned up to one of eight purposes: vehicle, education, other consumer loans, home improvement, other residential, principal residence, credit card, and other lines of credit. Loan type and loan purpose are then used to place a loan into one of the five debt classifications. This dual identification strategy helps identify both how the household thinks about the loan and the underlying good or service the loan finances. In short, recording the loan type allows for mapping back to the SCF itself, while also categorizing loans by loan purpose, makes it possible to properly aggregate debt on the balance sheet.

The SCF has up to 17 distinct pieces of information on any given loan: the loan type and loan purpose mentioned above, but also payment amount, whether the loan is currently in pay, whether the loan is on schedule, origination month, origination year, term of the loan, expected month of payoff, expected year of payoff, month when payments will begin, year when payments will begin, original amount, reported amount still owed, interest rate, credit limit, and whether the loan is secured by home equity. Different loans have different combinations of the 17 variables under various circumstances, but together they make it possible to estimate how much principal is currently being paid on any given type of loan, which is the key input to the "debt-pay-down" scenario.

Our analysis accounts for 431,892 loans across the 142,460 families in the 1995-2010 SCF samples. Each family has a (weighted) average of 2.85 loans (3.03 unweighted); some 19,308 (15,437 unweighted) households have zero loans. Among those households with at least one loan, the average number of loans per household is 3.29 (3.40 unweighted). In terms of mapping loans into debt categories, 22 percent are mortgages, 6 percent are for education, 54 percent are credit cards, 12 percent are vehicle loans, and 6 percent are other consumer loans.

Figure 1. Ratio of Net Worth to Disposable Income

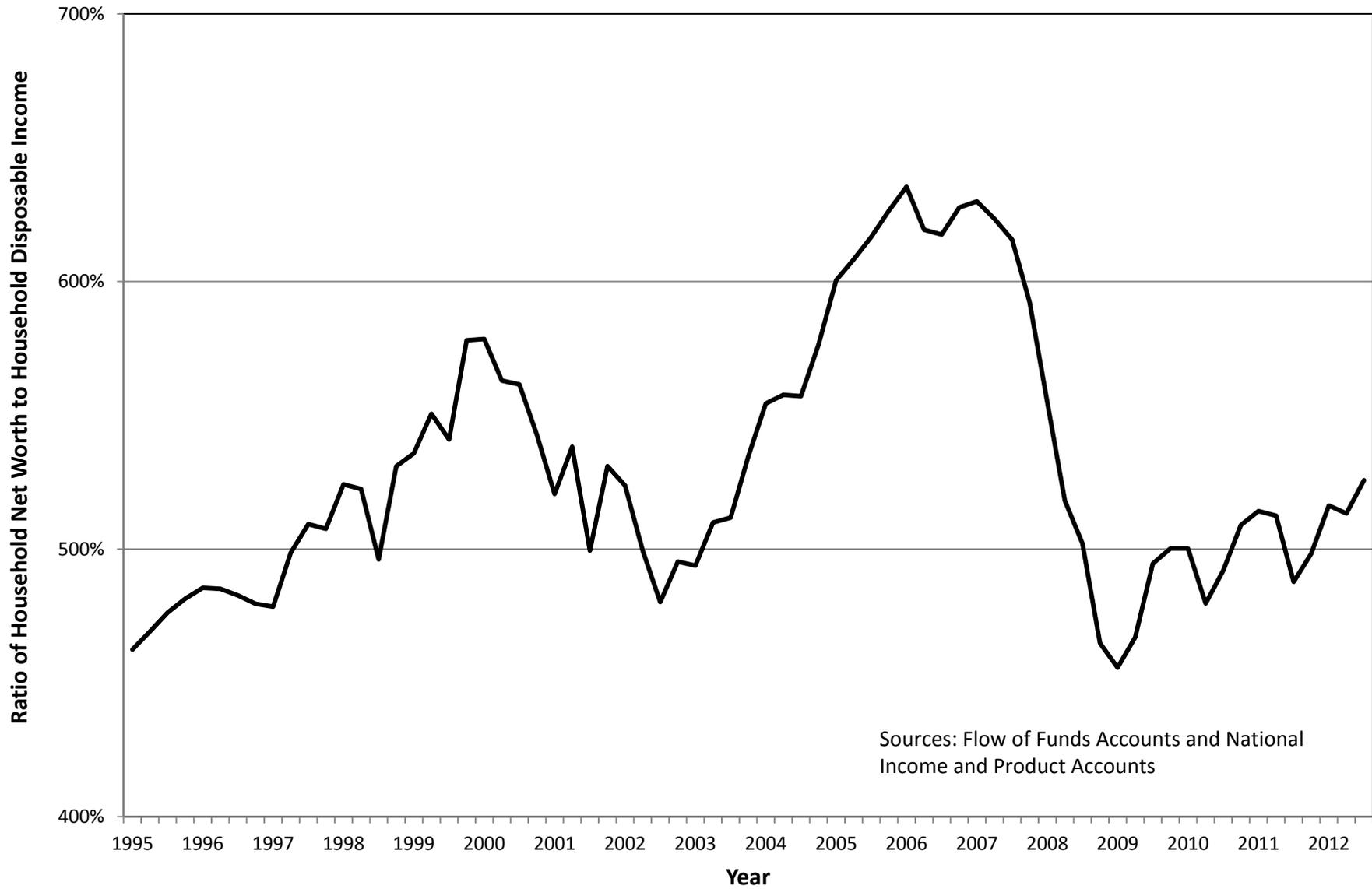


Figure 2. Aggregate Debt to Income Ratio

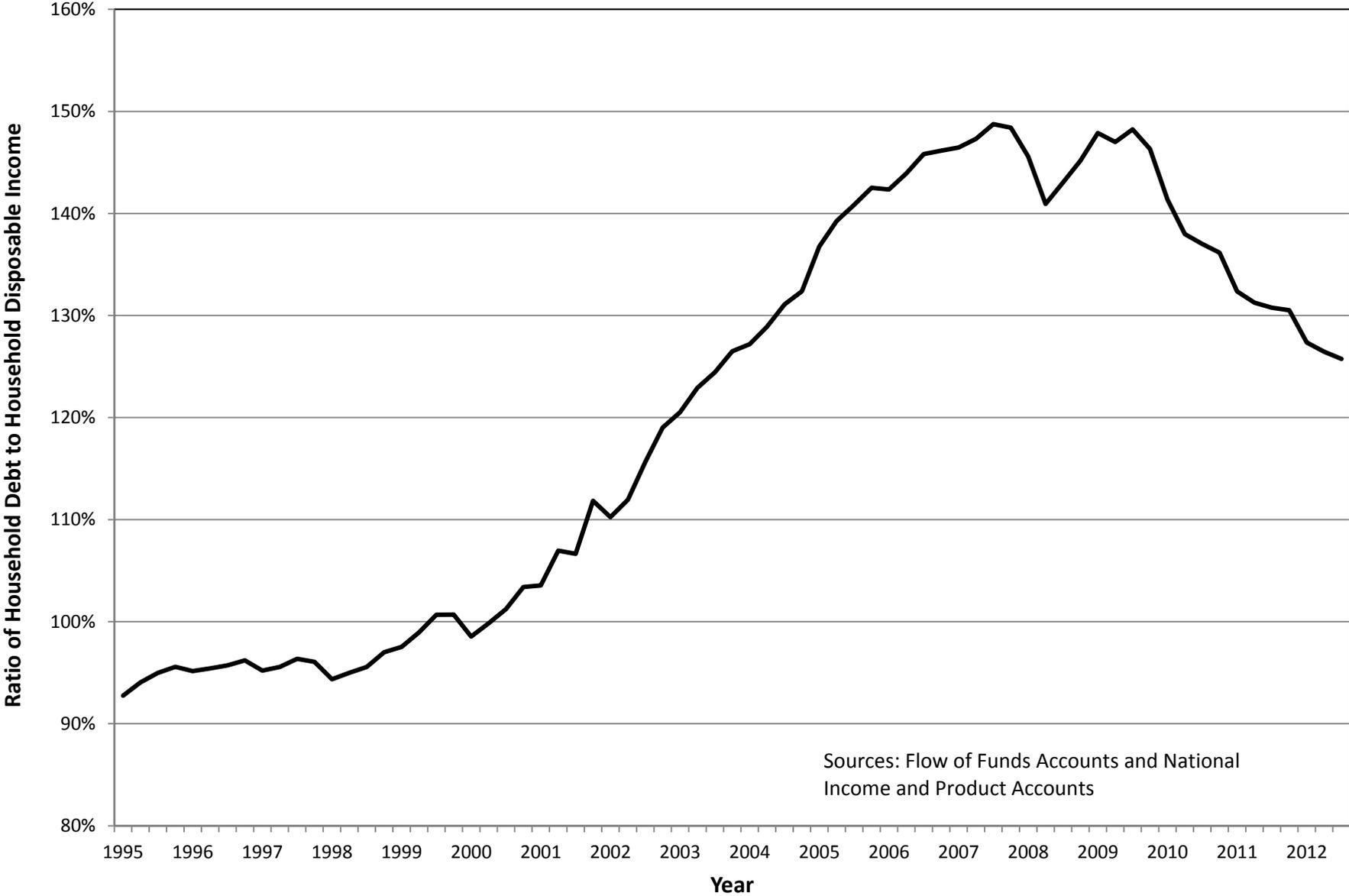


Figure 3. Aggregate Debt Service to Income Ratio



Figure 4. Aggregate Housing Debt to Housing Assets (LTV) Ratio

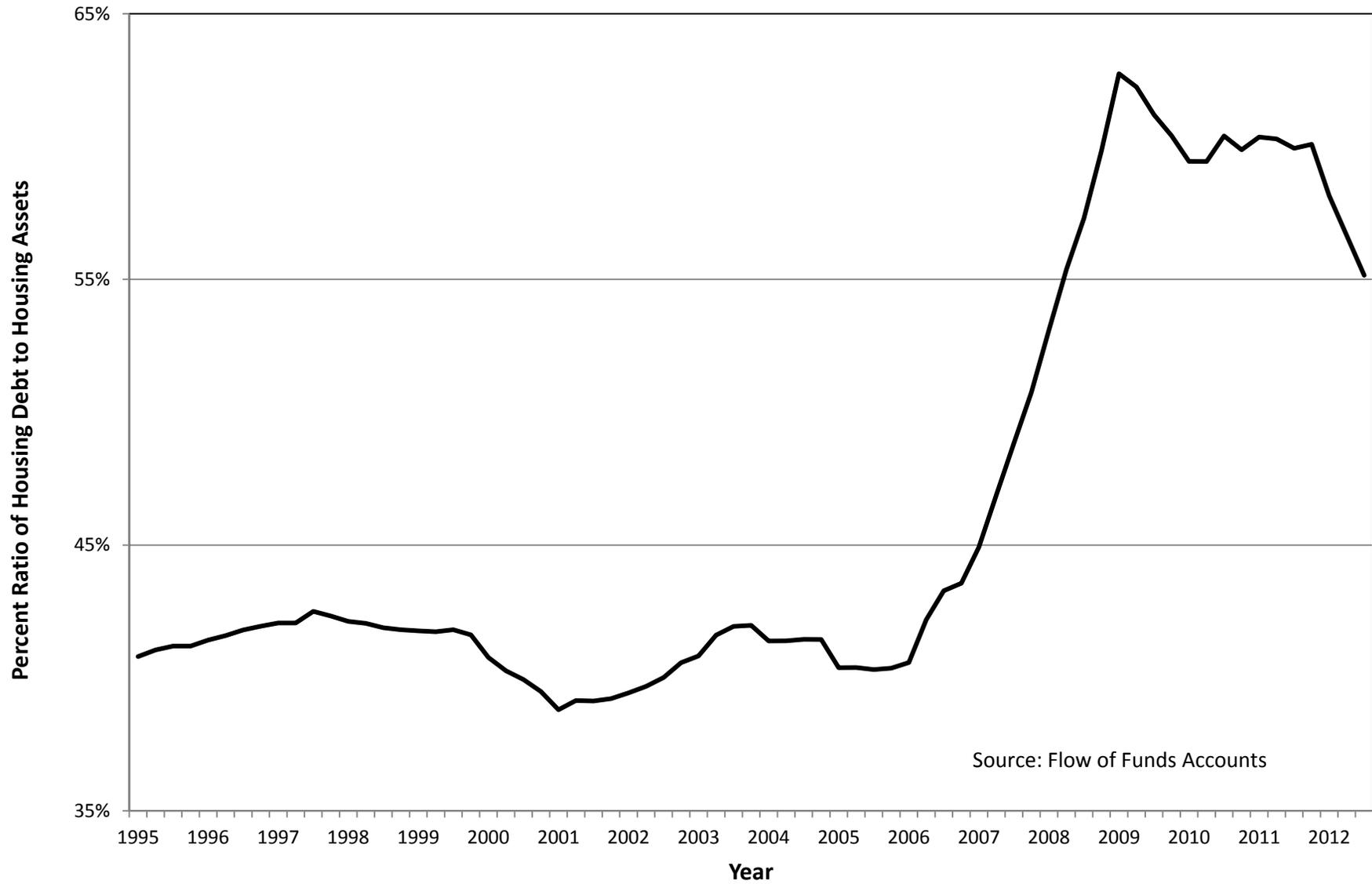


Table 1. Mean Net Worth (2012\$)s) by Normal Income

Normal Income Percentile	Actual		Percent Change
	2007 Q3	2010 Q3	
All	\$598,814	\$510,530	-15%
1 to 20	99,171	74,592	-25%
21 to 40	142,155	130,895	-8%
41 to 60	228,258	171,224	-25%
61 to 80	399,545	303,305	-24%
81 to 90	641,844	627,810	-2%
90 to 100	3,592,344	3,119,507	-13%

Table 2. Effect of Relative Prices on Mean Net Worth (2012\$)s) by Normal Income

Normal Income Percentile	Actual 2010 Q3	Projected		Percent Change from 2010 Q3	
		2011 Q3	2012 Q3	to 2011 Q3	to 2012 Q3
All	\$510,530	\$491,717	\$537,214	-4%	5%
1 to 20	74,592	71,421	75,394	-4%	1%
21 to 40	130,895	124,830	131,423	-5%	0%
41 to 60	171,224	163,052	174,688	-5%	2%
61 to 80	303,305	289,244	311,997	-5%	3%
81 to 90	627,810	600,420	655,394	-4%	4%
90 to 100	3,119,507	3,021,629	3,331,984	-3%	7%

Table 3. Effect of Relative Prices and Debt Pay Down on Mean Net Worth (2012\$)s) by Normal Income

Normal Income Percentile	Actual 2010 Q3	Projected		Projected Change from 2010 Q3	
		2011 Q3	2012 Q3	to 2011 Q3	to 2012 Q3
All	\$510,530	\$495,831	\$544,897	-3%	7%
1 to 20	\$74,592	\$72,343	\$77,039	-3%	3%
21 to 40	\$130,895	\$126,570	\$134,550	-3%	3%
41 to 60	\$171,224	\$166,034	\$180,171	-3%	5%
61 to 80	\$303,305	\$294,290	\$321,394	-3%	6%
81 to 90	\$627,810	\$607,847	\$669,237	-3%	7%
90 to 100	\$3,119,507	\$3,033,951	\$3,355,620	-3%	8%

Figure 5. Average Debt to Average Income Ratio, by Normal Income

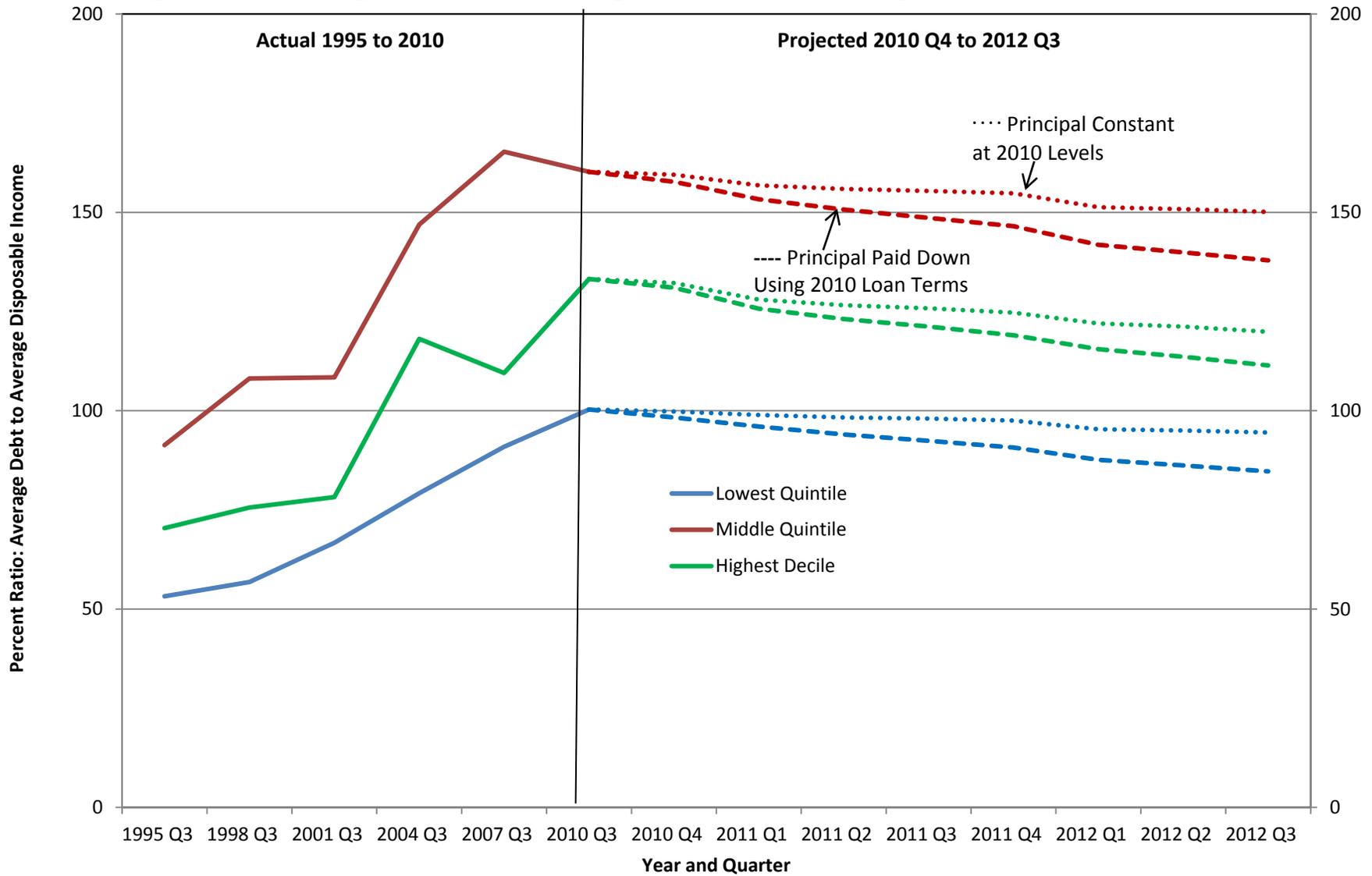


Figure 6. Average Debt to Average Income Ratio, by Age

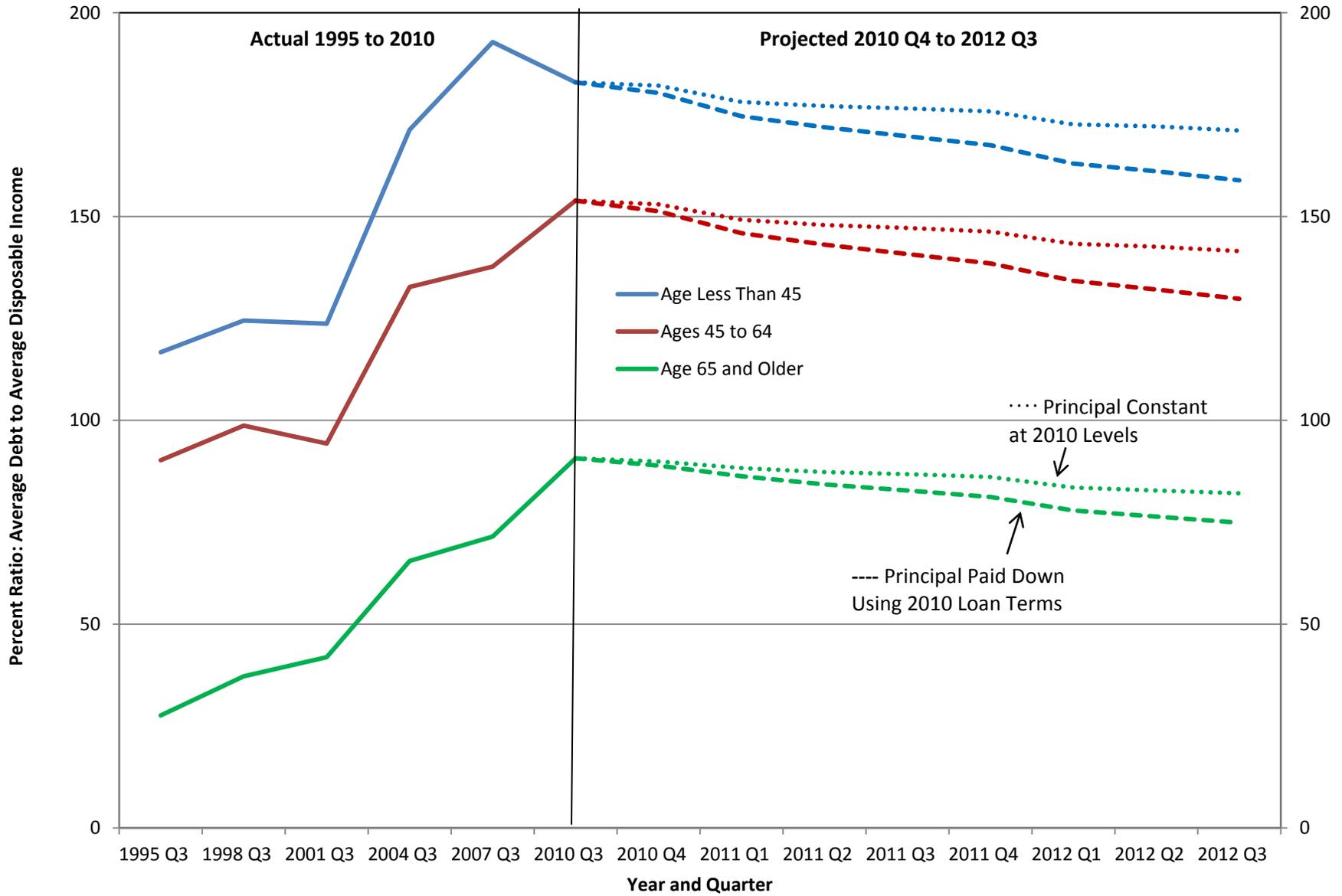


Figure 7. Families with Debt Service Ratio >40 Percent, by Normal Income

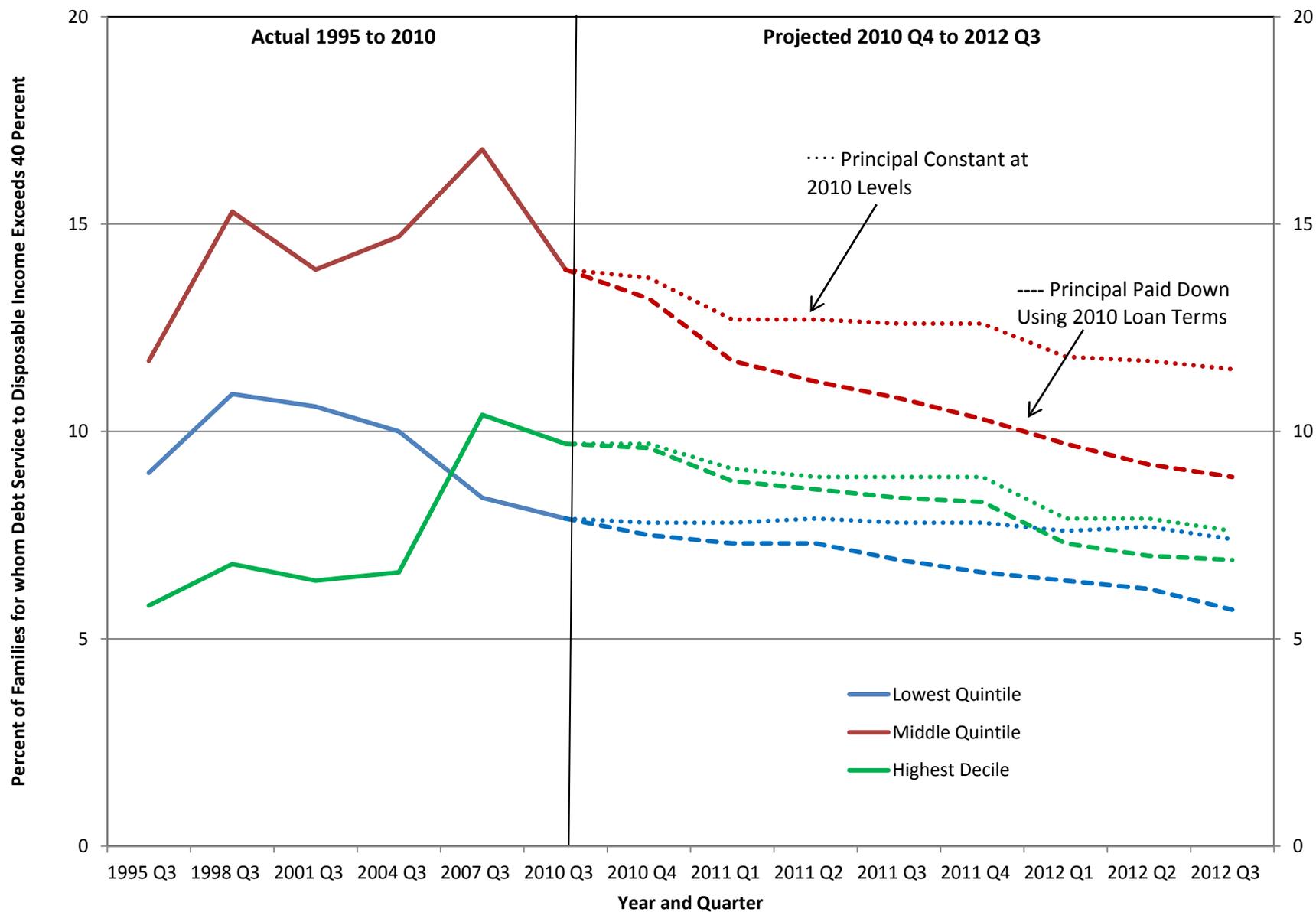


Figure 8. Families with Debt Service Ratio >40 Percent, by Age

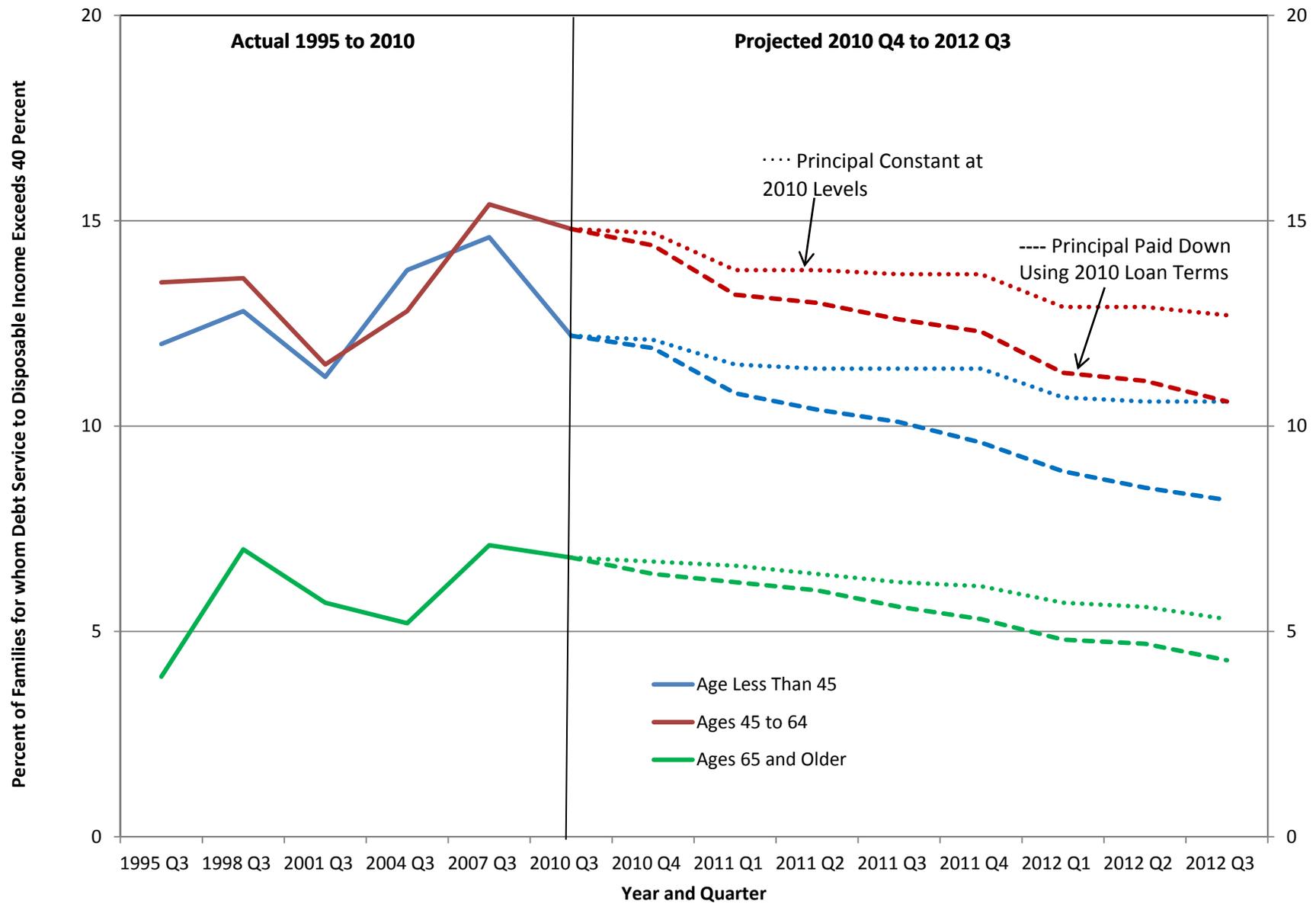


Figure 9. Families with Housing LTV>95 Percent, by Normal Income

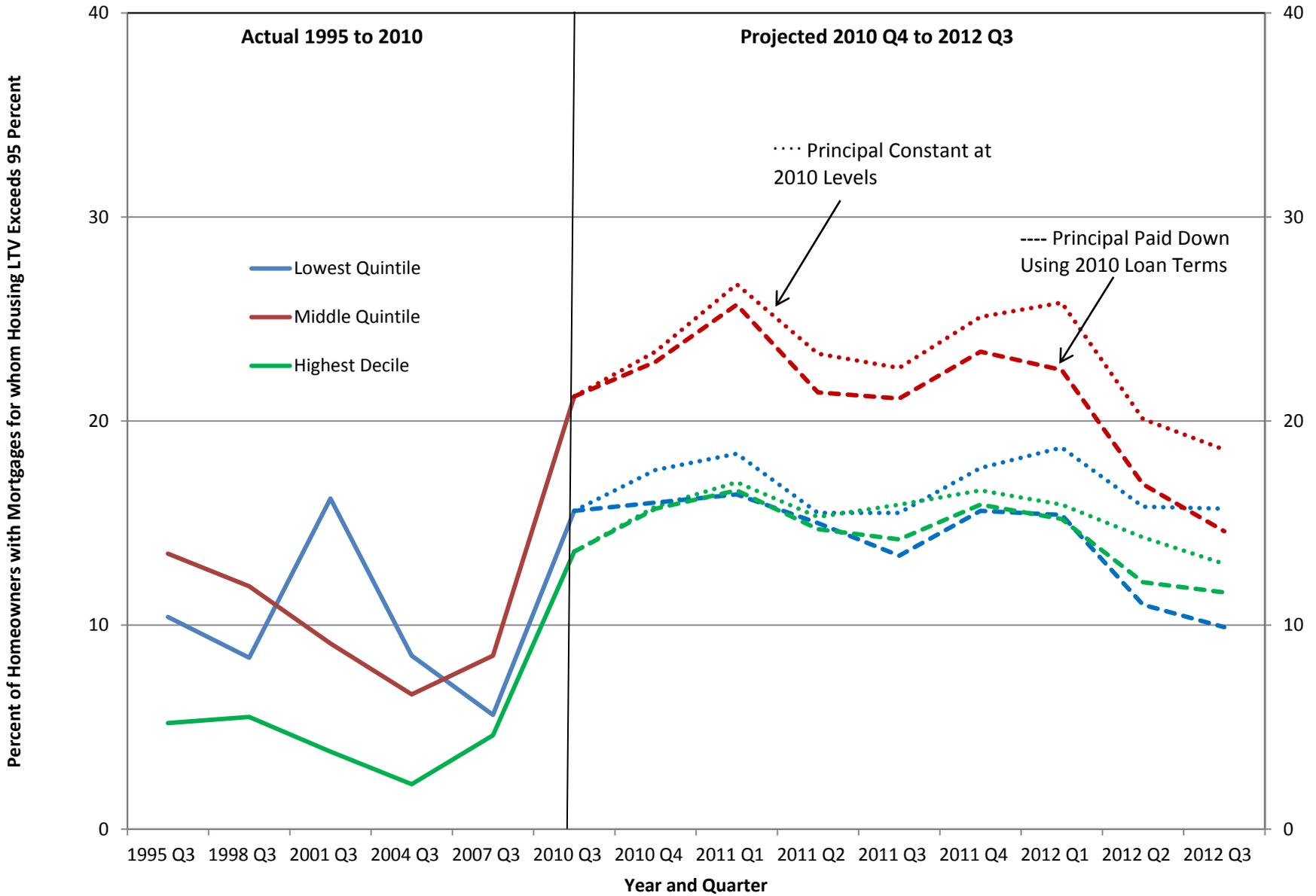


Figure 10. Families with Housing LTV>95 Percent, by Age

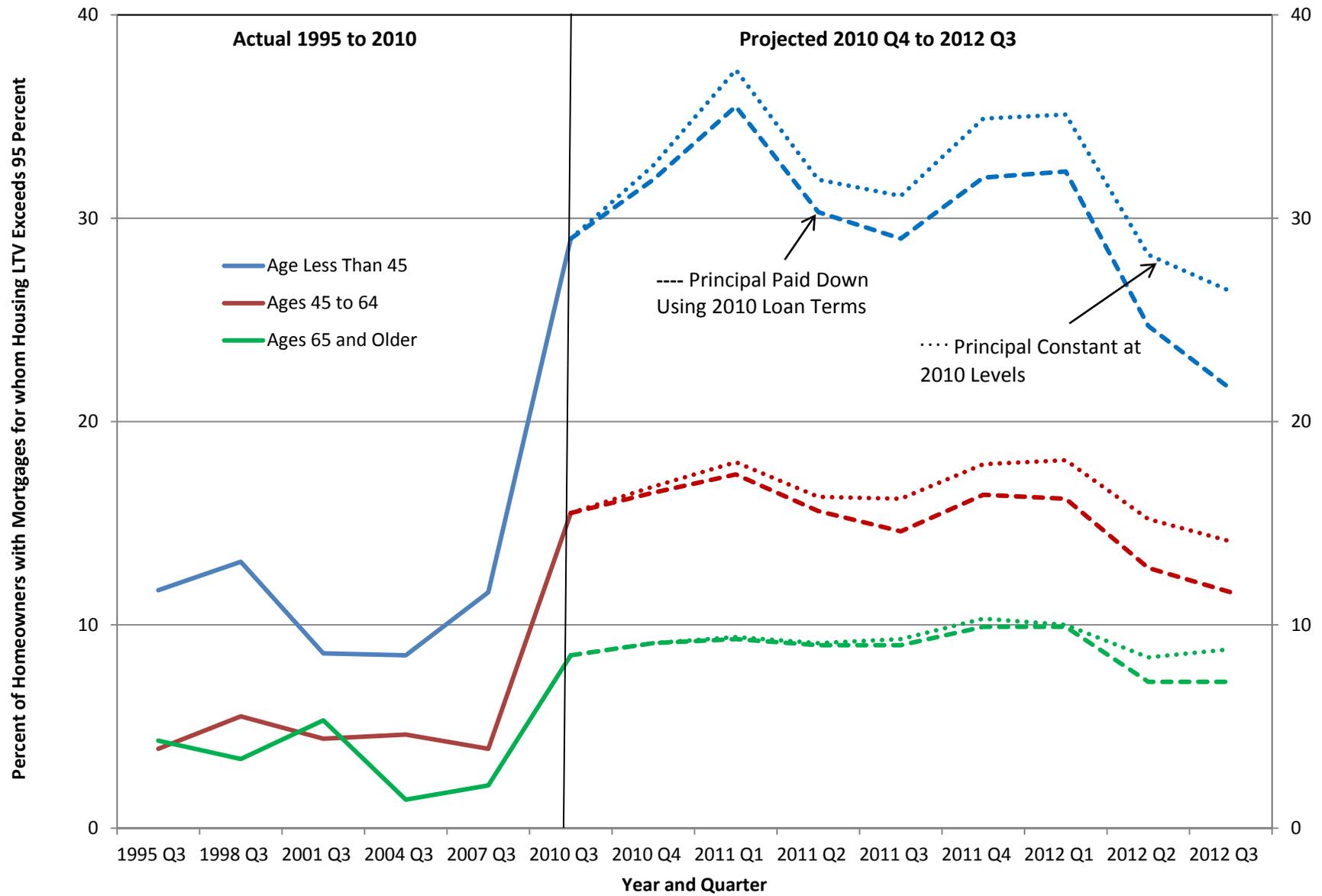


Figure 11. Families with Housing LTV>95 Percent, by Geography

