

Wealth Shocks and Macroeconomic Dynamics¹

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Abstract:

The effect of wealth on consumption is an issue of longstanding interest to economists. Conventional wisdom suggests that fluctuations in household wealth have driven major swings in economic activity. This article considers so-called consumption wealth effects. There is an extensive existing literature on wealth effects that has yielded some insights. For example, research has documented the average historical relationship between aggregate household wealth and aggregate consumption, and a large number of household-level studies suggest that wealth effects are larger for households facing credit constraints. However, there are also many unresolved issues regarding the influence of household wealth on consumption. We review the most important of these issues and argue that there is a need for much more research in these areas as well as better data sources for conducting such analysis.

Keywords:

Housing Wealth, Financial Wealth, Wealth Effects, Consumption, Borrowing Constraints, Saving, Household Debt, Deleveraging

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1. Introduction

The effect of wealth on consumption is an issue of longstanding interest to economists. The relationship is particularly important from a policy perspective, given the two major booms and busts in stock prices as well as the dramatic run-up and reversal of home prices experienced by the U.S. economy over the past two decades. The conventional wisdom is that the resulting fluctuations in household wealth have driven major swings in economic activity. Indeed, the plunge in wealth during the financial crisis is frequently cited as an important contributing factor to the unusually slow economic recovery from the Great Recession.

Against this backdrop, it is perhaps not surprising that a great deal of empirical research over the last 25-years has focused on so-called wealth effects—the impact of changes in wealth on household consumption and the overall macroeconomy. Such studies have used different types of data to examine the relationship between wealth and household spending, including macroeconomic time series, regional data, household survey results, and credit records. The research has yielded some important findings about the nature of wealth effects, but consensus has yet to be reached on many important issues. We review these questions and argue that there is a need for more research in the area as well as a pressing need to develop better data sources for such research.

2. Background

The recent major swings in U.S. household wealth began with a run-up in stock prices in the late 1990s, as shown in Figure 1, that was driven in large part by optimism over the potential for new technologies to raise the productivity of U.S. businesses. Market confidence collapsed in early 2000, and stock prices subsequently retreated as the U.S. economy experienced a mild recession. By mid-2003, however, employment conditions began to show decided improvements amid robust economic growth, and the United States thereafter saw several years of rapidly rising stock and home prices.

Unfortunately, the prosperity of the early 2000s proved to be transitory. Home prices, which had risen well above the levels justified by fundamentals, began to edge down in 2006 and were declining sharply by 2007. Delinquency rates on mortgages rose, starting with so-called affordable mortgages, many of which were fundamentally unsustainable in the absence of continued home price appreciation. The ensuing rise in defaults led to a tightening of credit

conditions, exacerbating the financial strains on households. As employment losses began to mount, mortgage performance further deteriorated. Ultimately, the problems in the mortgage market, along with other adverse developments in financial markets and the real economy, led to the most severe financial crisis and economic downturn in the United States since the Great Depression. By early 2009, the value of stocks held by households was down roughly 50 percent from its peak, and the value of real estate owned by households was down roughly 25 percent. More recently, stocks have recovered their losses, but home prices have seen only a small rebound in most areas and remain well below their previous highs.²

The evolution of U.S. household wealth clearly shows the imprint of these dramatic movements in asset prices, as shown in Figure 2. The stock price bubble of the late 1990s propelled the aggregate ratio of household wealth to disposable personal income from less than 5 to 6.1 at its peak at the turn of the century. After taking back most of these gains in the early 2000s, the ratio shot up again during the housing boom, reaching 6.5 in late 2006 before tumbling during the recession to its lowest level in about fifteen years. Since the recent low point in early 2009, the household wealth-to-income ratio has returned to about its average level since the mid-1990s.

According to conventional wisdom, these swings in household wealth have been important drivers of economic activity in the United States. Policy-related discussions often reference the relationship between household wealth and consumption. For example, in its February 1996 *Monetary Policy Report to Congress* the Federal Reserve noted: “In the household sector, the accumulation of financial wealth brought on by the rise in the stock market has provided the wherewithal for increases in consumption greater than would otherwise have been expected—countering the potential negative influences of more burdensome levels of consumer debt” (p. 286). In a 2002 speech, then Federal Reserve Governor Edward Gramlich remarked that “the link between aggregate household wealth and spending has remained one of the sturdier empirical relationships in macroeconomics.” In a section focusing on job losses and the financial crisis, the 2013 *Economic Report of the President* stated that “A total of \$16 trillion in wealth was erased by the financial and housing crisis, causing families to pull back on spending plans, reduce personal debt and increase savings, in turn leading companies to cut back

² Prices have recovered more rapidly in the areas that experienced the largest price drops such as Las Vegas and Phoenix.

hiring, lay off valued employees, and halt investment plans.” The high level of attention given by policymakers to household wealth underscores the importance of understanding its relationship to consumption.

3. Estimating Wealth Effects Using Macro Data: Basic Results and Limitations

Standard economic theory offers a framework for thinking about wealth effects. According to the permanent income hypothesis, households consume a constant fraction of the present discounted value of their lifetime resources. Changes in wealth that permanently alter households’ resources therefore should cause consumption to change in the same direction.

This posited relationship is consistent with the strong positive correlation seen when the aggregate “consumption rate” (consumption as a share of disposable personal income) is plotted against the ratio of aggregate household wealth to disposable personal income, as seen in Figure 3. More formal modeling of the relationship between these macroeconomic series has produced estimates of the timing and magnitude of the wealth effect. Davis and Palumbo (2001) present an analysis based on typical forecasting models and conclude that consumer spending rises by between 3 and 6 cents for every additional dollar of wealth, with the effect occurring gradually over a period of several years (see also, Lettau and Ludvigson 2004).

While macroeconometric models provide useful guidance on the average historical relationship between aggregate consumption and wealth, these models also have limitations. In particular, the degree to which these models are useful for forecasting aggregate consumption dynamics depends on whether the average historical experience captures what is likely to happen going forward. It will if household behavior is homogeneous and if changes to the economic environment are distributed evenly and consistently across households over time. In practice, however, these theoretical conditions are not met: the actual economy is characterized by heterogeneity that is not consistent over time.

One factor driving heterogeneity in households’ responses to changes in wealth is the presence of credit constraints for some households. Constrained households are likely to consume at a suboptimal level because they cannot borrow as much as they desire. As a result, the response of their consumption to wealth gains may be particularly powerful (at least to the extent that those gains can be liquefied). Because lower-income households are more likely to face credit constraints, this logic represents one justification for the concavity of the consumption

function featured in models like Carroll, Slacalek, and Sommers (2012). That is, these models predict that the marginal propensity to consume out of wealth will rise with income.

The link between credit constraints and heterogeneity in wealth effects has received much attention in the empirical literature. Lehnert (2004) finds higher propensities to consume out of housing wealth for younger U.S. households compared to their somewhat older counterparts, arguing that young households are the most likely to be credit constrained. Campbell and Cocco (2007) present a comparable analysis using U.K. data and found similar results. In more recent work, Cooper (forthcoming) uses several alternative approaches to show that borrowing constraints strengthen the relationship between consumption and housing wealth in U.S. household-level data. Using spending and balance sheet data at the regional level, Mian, Rao, and Sufi (2013) find significantly higher propensities to consume for poorer and more levered households—again, the groups most likely to be credit constrained. Using similar data, Brown, Stein, and Zafar (2013) observe a steady, positive relationship between debt and wealth for younger and more marginally creditworthy homeowners than for other homeowners, suggesting more robust wealth effects for the former group. All told, although the precise results differ from paper to paper, the findings in this branch of the literature are strongly consistent with the view that housing wealth effects are larger for households that are more likely to be facing borrowing constraints.³

The geographic dispersion of the housing wealth movements of the last decade represents another possible source of heterogeneity in wealth effects. Figure 4 shows the wide dispersion of home price appreciation across states from 2002 to 2006. For the most part, the subsequent housing bust was similarly concentrated. This distribution should be relevant for the strength of the aggregate wealth effect given that different states have different demographic characteristics that should affect the response of consumption to wealth (for example, one might expect a stronger effect in states where the population is concentrated in demographic groups that are more likely to face credit constraints).

These types of heterogeneity do not in and of themselves invalidate macroeconomic models used to analyze wealth effects. If aggregate wealth changes always had the same distribution across people and space, then the estimated coefficients from the models—which

³ Other recent related wealth effects research includes Abdallah and Lastrapes (2013), Bostic, Gabriel, and Painter (2009) and Case, Quigley and Shiller (2005, 2011, and 2013).

essentially reflect the average historical relationship between wealth and consumption—would well capture the expected response to a new change in wealth. But, in fact, the distribution of aggregate wealth changes across different types of people is not consistent over time; it varies because of differences in the types of wealth held and also because the fraction of people having a certain trait (such as being credit-constrained) can change. The spatial dispersion of wealth shocks also varies over time. For example, a coastal home price boom in the mid-1980s resulted in a different geographic pattern of home price appreciation than occurred in the more recent housing boom, with real home prices surging 39 percent in the Boston Metropolitan Statistical Area (MSA) between 1984 and 1986, and real home prices rising only about 8.5 percent in the Chicago MSA and 4.3 percent in the Kansas City MSA over this same period.

4. Key Unresolved Issues Regarding Wealth Effects

Traditional macroeconometric models of wealth effects represent a workhorse tool for analysts seeking to gauge the influence of wealth on macroeconomic dynamics. In some contexts, this approach has proved useful; for example, these models have yielded simple rules of thumb about how much aggregate household spending has historically tended to change in response to fluctuations in aggregate wealth. However, as noted above, the highly aggregate nature of the framework leaves it vulnerable to error since the nature of wealth shocks as well as the population affected by wealth shocks is ever changing. To overcome this limitation, it is essential that researchers and policy analysts understand more about wealth effects and particularly about their underpinnings. We already described one area of reasonable consensus in the existing wealth effects research—wealth effects appear to be more pronounced for households facing credit constraints. There are also many other topics related to wealth effects where much less is known and agreed upon. In this section, we review where the literature stands on four important—and as yet unresolved—issues regarding wealth effects.

4. A. Is Housing Wealth Really Wealth?

The recent boom and bust in home prices has spurred interest in how housing wealth influences the macroeconomy, and, in particular, whether housing wealth has the same effect on households' spending decisions as financial wealth. These differences matter for thinking about the interaction between household wealth and the macroeconomy because the vast majority of forecasting models follow Thaler's (1990) assumption that assets are fungible and money is money. Accordingly, these models typically include just total wealth rather than its components. This means that the coefficient on wealth reflects the average relationship between, for example, consumption and wealth over time, which is influenced by the average historical "driver" of total wealth movements. As a result, this estimated relationship may be higher or lower than the propensity to consume out of a given component of wealth. If households indeed have different propensities to consume out of one type of wealth than another, accurate forecasting of macroeconomic growth will require taking account of these differences and any divergent movements in the various components of household wealth.

Based on first principles, Buitert (2010) and Flavin and Nakagawa (2008) both argue that housing wealth should not have an obvious relationship with consumption because it is not really wealth.⁴ The underlying intuition hinges on the idea that housing wealth differs from other household wealth because a home both provides a flow of consumption services and is an asset for a household. The former consideration matters because when home prices rise, the ownership (or rental) costs of housing increase, implying a higher cost of consumption.

Indeed, some households will be better off when home prices rise and others will be worse off. Renters are unambiguously worse off when the cost of housing consumption increases because, for a given amount of income they must reduce their consumption of non-housing goods in order to offset the higher cost of their shelter. The impact of home price appreciation on homeowners is less clear. Like renters, homeowners will face higher future housing costs, but they also experience a capital gain; accordingly, if housing costs do not increase one-for-one with home price appreciation, then homeowners could be better off when house prices rise. Typically, though, economists think that housing costs and home prices move together so

⁴ Buitert begins his article by recounting how Mervyn King told him in the late 1990s that "housing wealth isn't wealth." At the time, King was the chief economist at the Bank of England, but he went on to become Governor of the Bank of England.

homeowners' true gains from housing appreciation may be small or nonexistent.⁵ Moreover, homeowners may have to re-optimize their housing consumption and downsize their housing stock in order to fully realize their gains for non-housing consumption purposes—something that many homeowners may not be willing to do, especially in the short-term.

Going beyond the basic theoretical framework, housing wealth may influence consumption *indirectly* through its role as borrowing collateral. When home prices rise, homeowners have more collateral against which they can borrow in order to finance more purchases of goods and services (including home improvements) and to meet other financial needs. Constrained homeowners are therefore likely to increase their spending when home prices increase and they can monetize the equity in their homes. In the data, this effect should show up as a positive relationship between housing wealth and consumption.

Financial intermediaries are a key part of this collateral channel of wealth effects, as liquefying housing capital gains requires a bank or other financial institution to loan households funds against the value of their housing equity. This implies that the collateral channel of housing wealth effects will be sensitive to the strength of the financial sector. In particular, when banks have inadequate capital relative to the losses they expect on their portfolios, their willingness and ability to lend will be diminished. In contrast, banks will be more likely to supply credit when their balance sheets are sound and loan performance is good. A key implication is that, because a large portion of bank lending is tied to the housing market, bank health and, in turn, credit availability will vary with home prices. This, in turn, creates a mechanism that should amplify collateral-related housing wealth effects. In other words, rising home prices potentially stimulate consumption not only by creating more valuable borrowing collateral, but also by increasing the willingness of financial intermediaries to lend against a given amount of collateral.⁶

Note that this type of amplification is less likely to occur for wealth effects related to capital gains on stocks and bonds for two reasons. First, financial intermediaries are less necessary to the consumption of such gains because stocks and bonds can most often be sold

⁵ Indeed, Browning, Gortz, and Leth-Peterson (2013) show that most homeowners do not feel richer when housing prices rise.

⁶ Empirically testing this loan supply channel is difficult. Cooper, Olivei and Peek (in progress) are exploring the difference in the relationship between home price changes and consumption for renters compared to homeowners as a potential source of identification. All else equal, renters not planning to switch into homeownership should only see their consumption affected by house price fluctuations to the extent those fluctuations impact bank health and, in turn, renters' ability to secure auto and personal loans to help finance their spending.

fairly easily and cheaply to finance a household's desired consumption. In contrast, selling a home is disruptive and involves non-trivial transaction costs. Moreover, households that hold stocks and bonds likely have other sources of liquid saving that they can draw down to realize stock and bond related wealth effects. Second, bank health is less directly tied to financial market volatility than housing market price changes since banks are not allowed to hold stocks in their portfolios.⁷

Some researchers have suggested considerations besides housing's role as collateral that might motivate housing wealth effects. Case, Quigley, and Shiller (2013) argue that there might be psychological reasons why homeowners may increase their consumption in response to housing appreciation. For instance, they may be responding to societal perceptions that housing gains make them better off or they may be myopic and fail to understand that they face higher future housing costs. Gan (2010) argues that gains in housing wealth matter for consumption because they lower households' desired precautionary saving since housing equity can serve as a buffer against future income risk. On the other hand, Levin (1998) points to behavioral arguments involving self-control that suggest that consumption should not be very sensitive to changes in the value of illiquid assets like housing, particularly in comparison to changes in more liquid forms of wealth.

Taken together, these various theoretical considerations suggest that the housing wealth effect could be larger or smaller at the household level than the effect associated with household financial wealth. In the aggregate, differential patterns in the distribution of different types of wealth are relevant to what one might expect in terms of the relative size of the housing wealth versus financial wealth effects. In particular, housing wealth is more broadly held than other types of wealth. Table 1 shows that roughly two-thirds of U.S. households own homes while only about half hold stocks (including stocks held indirectly through mutual funds, defined-contribution retirement plans, and the like).⁸ In addition, the share of housing wealth in total wealth is much higher for lower-income homeowners than for higher-income homeowners, as shown in Table 2. Compared to higher income households, lower-income households are more likely to be credit constrained and myopic, so the higher housing wealth concentration in lower

⁷ Banks can and do hold bonds in their portfolios so they are not completely isolated from firm health and other non-housing related economic fluctuations.

⁸ The data come from the Survey of Consumer Finances (SCF), weighted to be nationally representative. Because the SCF oversamples wealthy households who are the most likely to hold stocks, its data are viewed as being particularly accurate for these types of comparisons.

parts of the income distribution should tend to make the aggregate marginal propensity to consume out of housing wealth higher than the aggregate marginal propensity to consume out of financial wealth.

All told, then, the size of the housing wealth effect relative to that for other types of wealth is largely an empirical question. Although this question received much attention within the wealth effects literature during and after the recent housing boom and bust, consensus has yet to be reached. Case, Quigley, and Shiller (2005) found relatively large housing wealth effects and relatively small financial wealth effects using state-level panel data. Bostic, Gabriel, and Painter (2009) found similar results using household-level data, and Mian and Sufi (2011) concluded that housing wealth effects are very large based on individuals' credit-record evidence on the amount of housing capital gains that were liquefied during the housing boom. In contrast, after paying particular attention to the borrowing collateral role of housing wealth Cooper (forthcoming) finds slightly larger financial wealth effects than housing wealth effects. De Bonis and Silvestrini (2012) also found larger financial asset effects than real (housing) wealth effects on consumption using a panel of OECD countries.⁹

4. B. The Underpinnings of Stock Market Wealth Effects

Although stocks do not provide consumption services like housing, other complications present themselves when thinking about the mechanism behind stock market wealth effects. First, rising stock prices require individuals who do not own stocks but intend to do so in the future (for example, younger households with plans to begin saving for retirement) to purchase them at a higher price. Second, some increases in stock prices reflect higher expected future dividends because of upward revisions to firms' productivity, while other increases reflect reductions in the rate at which future dividends are discounted. In the former case, stockholders are unambiguously better off, but in the latter case they are not because the discounted value of planned future consumption is also revised upward. Third, some recent evidence suggests that because of behavioral considerations individuals might respond anomalously to stock market gains realized in defined-contribution pension accounts. In particular, Choi, Laibson, Madrian, and Metrick (2009) find that individuals tend to raise their retirement plan contributions after

⁹ Sierminska and Takhtamanova (2012) showed that the relative size of the financial wealth effect versus housing wealth effect depends on the country studied and that the within-country differences may be driven by certain age groups.

experiencing good returns; if these higher contributions are funded by reduced consumption, one would see a wealth effect in the opposite direction from what standard theory predicts.

In the data, there is a strong positive relationship between aggregate consumption and aggregate stock prices. But, given the considerations above, some analysts have argued that this relationship may not stem from the direct effect financial wealth on consumption but rather from a signaling channel. In particular, since stock prices tend to rise and fall with optimism about the economy, it may be the case that consumption is responding primarily to revisions to households' expectations about future wage growth.

The standard empirical approach to this question is to look at whether stockholders have a different response to stock price increases than nonstockholders—the existence of a direct wealth effect is supported by findings that the response of stockholders is more pronounced. Poterba and Samwick (1995) find stockholders' food consumption reacts more strongly to stock market movements than that of nonstockholders, and Dynan and Maki (2001) find a similar response for a broad measure of consumption. Maki and Palumbo (2001) create synthetic data on saving and capital gains for different cohorts of households during the 1990s and find that the largest declines in saving (and therefore the biggest increases in consumption) occurred for the groups most likely to hold stocks.

Much less work has been done on this question over the past decade, with the focus of the empirical wealth effects literature shifting largely to the housing area. However, Dynan (2010) finds preliminary evidence that incorporating more recent household-level data into analyses of the differential behavior of stockholders and nonstockholders considerably weakens the earlier results. Given that the dramatic swings in stock prices since the late 1990s offer a greater opportunity for identification of the underpinnings of the stock market wealth effect, more research should revisit the earlier findings.

4. C. Wealth Effects and the Liabilities Side of the Balance Sheet

Wealth effects are typically viewed as stemming from movements in the prices of assets such as stocks and homes. However, a household's net worth is also a function of the debt that it holds. The U.S. economy's sluggish performance following the Great Recession raised questions about whether the high levels of household debt and leverage that were left after the mortgage boom

and bust damped consumption more than would have been expected based only on the associated movements in wealth. If so, a lesson would be that economists should take account of changes in household debt and leverage in addition to looking at movements in overall wealth.

The theoretical case for a special role for household debt in determining consumption is not completely clear, as the traditional models used by economists suggest that debt does not exert an independent influence on consumption (although a positive and endogenous relationship would be expected because debt represents a way to finance spending that is spurred by other considerations). However, going beyond the simple models, a case can be made on several grounds that high debt and leverage does impede consumer spending. First, some households may target a given level of debt relative to their income or assets; if the events of recent years increased these ratios (or lowered households' target ratios), one might expect these households to choose to pare back their consumption in order to pay down debt. Second, high-debt households may have become more worried about future credit availability, leading them to cut their consumption so as to increase their savings. Third, households whose current income is lower than their permanent income may have been forced to reduce their consumption because their high debt ratios prevented them from obtaining additional credit they may have needed to finance their desired spending.¹⁰

Turning to the empirical literature, Cooper (2012) presents an analysis of aggregate data that concludes that consumption has not behaved particularly unusually given movements in household income and net worth. Yet, in household-level data, Dynan (2012) and Cooper (2012) both find that high debt had a negative impact on consumption growth during the Great Recession even after controlling for income, net worth, and other factors likely to affect spending. As Cooper (2012) highlights, this negative relationship existed prior to the Great Recession, suggesting that recent period is not particularly unusual. Even so, debt could have had a larger recent impact on consumption since more households are burdened by high debt and leverage compared with earlier periods. In addition, Dynan and Edelberg (2013) show that high-debt households were more likely to report scaling back their consumption in 2009, after controlling for other drivers of spending. Finally, as noted earlier, Mian, Rao, and Sufi (2013)'s

¹⁰ Relatedly, high debt and leverage have impaired some households' ability to refinance their mortgages into lower-rate loans and lower their required mortgage payments in recent years. As a result, the consumption of cash-constrained households likely did not increase as much as it typically does when interest rates fall.

analysis of regional data concluded that leverage helped amplify the negative wealth effect on consumption associated with declining house prices during the Great Recession.

The household-level empirical research on the relationship between debt and consumption is, as yet, limited. At best, it considers only the period through the Great Recession and does not directly speak to the economy's weak performance during the recovery. Moreover, the standard errors in many of these studies are large. Finally, the emphasis has been on establishing the relationship rather than discerning why a relationship exists, an issue that is highly relevant to the discussion pertaining to what, if any, policies should be used to address the situation. These shortcomings suggest many promising avenues for further empirical research.

More theoretical work on the connection between household debt and leverage and macroeconomic activity is also needed. Some preliminary steps in this direction have been taken (see, for example, Eggertsson and Krugman, 2012) but more work needs to be done to realistically characterize the complex linkages found in the actual economy.

4. D. Has the Wealth Effect Changed over Time?

As noted above, if the response of household spending to changes in wealth differs by type of wealth, then one should expect to see the strength of the aggregate wealth effect vary over time depending on what has been driving movements in aggregate household wealth. In this section, we discuss other reasons why the wealth effect—at both the aggregate and individual levels—may change over time.

To begin, shifting demographics may have altered the size of the aggregate wealth effect. In principle, older households with shorter remaining life horizons over which to annuitize wealth changes should have a larger marginal propensity to consume out of wealth shocks than younger households. Of course, such age differences may depend on whether households' planning horizons actually depend on their expected remaining lifespan—they might be muted if households take a dynastic view and intend to share their gains with their descendents. But, generally, this consideration implies that the aging of the baby boom generation should tend to increase the aggregate marginal propensity to consume out of household wealth.

Financial innovation may have also changed the link between wealth and consumption. As discussed by Gerardi, Rosen, and Willen (2010), starting around the early 1980s, technological advances and institutional developments (including regulatory and tax code

changes) reduced credit constraints, increasing availability and lowering the cost of borrowing. The effect of these changes on the size of the wealth effect is unclear. On the one hand, having fewer credit-constrained households might reduce the aggregate wealth effect since, as discussed above, the empirical evidence suggests that credit constraints tend to be associated with a stronger housing wealth effect. On the other hand, financial innovation made it easier and cheaper to realize home equity gains through home equity loans and cash-out refinancing transactions, such that homeowners still constrained could borrow more easily against housing capital gains. This second trend should have tended to increase the aggregate wealth effect. Of course, in recent years, credit availability has swung in the other direction undoing some, though not all, of these changes.

On the asset side of the balance sheet, financial innovation has allowed more households to own stocks through vehicles such as mutual funds and 401(k)-like accounts. Although the ownership rate of these assets has been around 50 percent since 2000 (Table 1), it was only a little more than 30 percent in the late 1980s (Dynan 2009). As a result, more stocks are held by lower-income households that likely have higher marginal propensities to consume. All else equal, this should have tended to increase the aggregate wealth effect, although the effect could be muted or even go the other way if households view their retirement accounts as “off limits” for consumption. Behavioral theories suggest that the spending of some households might even fall in the face of capital gains on their retirement accounts if they invest more to “chase returns,” further damping the aggregate marginal propensity to consume.

All told, many factors may have changed the aggregate wealth effect over time. Assessing the direction in which it has changed is difficult using aggregate data because of the small sample sizes. For example, recent research by Soss and Mo (2013), analysts at Credit Suisse, showed that the estimated wealth effects for both housing and financial wealth were smaller when post-financial crisis data were used in the analysis, but the limited variation seen since the crisis (home prices were roughly flat and the stock market mostly trended upward) means that the authors could not effectively estimate separate coefficients for the different periods. However, researchers should be able to draw inferences on how the wealth coefficients may have changed in response to these developments using household-level or regional data, where the price variation is much richer.

5. Data Challenges

As has been discussed throughout this piece, macroeconomic data have offered only a small amount of insight into the relationship between wealth and consumption. The variation in macroeconomic time series data is limited, which hinders identification, particularly when relationships are changing over time and the determinants of consumption are inter-related.

Household survey datasets tend to be much richer in scope and they typically have many observations such that there is much more opportunity for identification. Yet, they too have shortcomings. First, most household datasets do not have all of the elements needed for estimating consumption functions—a panel dimension, complete balance sheet information, broad measures of consumption, good income measures, and demographic information (which can proxy for preferences, risk of job loss, access to credit, and other things). Even when such information is available (as in the cases of the U.S. Panel Study on Income Dynamics and the U.S. Health and Retirement Survey), the data tend to be noisy because of recall error and other measurement problems, leading to imprecise estimates of key relationships. Household survey data are also not without identification issues, but these issues can be circumvented by, for instance, looking at effects across different groups of households. (See Cooper 2012 for more details).

Recently, researchers have turned to administrative records, such as data from credit bureaus or financial services companies. These datasets tend to be quite detailed and accurate in terms of the data the companies track and record, but they lack direct measures of household consumption, income, and total wealth. Researchers such as Mian, Rao, and Sufi (2013) have aggregated these types of administrative records to the regional (county or zip code) level and then combined them with other regional information related to consumption, income, and wealth in order to do more complete analyses. This approach shows some promise and should be explored more fully. However, identification with regional data can be difficult because the set of covariates is not as rich as it would be in household survey data. For example, there is no data source in the United States that offers complete information about financial wealth by region. An ideal solution might be to merge the less noisy administrative data on the available variables into household surveys in order to have the best of all worlds.

6. Conclusion

To date there has been much interesting research on and debate surrounding the influence of wealth shocks on macroeconomic dynamics. Much remains to be learned in this area. Understanding wealth effects is critical not only for forecasting consumption and broader economic growth well but also for gauging the risks to the economic outlook and setting appropriate macroeconomic policy. Such issues are particularly important during periods of large fluctuations in asset prices.

Research has documented the average historical relationship between aggregate consumption and aggregate household wealth, and some findings have been established about how households respond to wealth changes. For example, a large number of studies suggest that the consumption of households facing credit constraints is more responsive to housing capital gains than that of other households. However, we have identified a need to learn much more about the underpinnings of wealth effects and how the effects might vary for different components of household wealth, including on the liabilities side of the balance sheet. On a related topic, more work is needed to understand how aggregate wealth effects may have changed (and still are changing) over time. Wealth effects research has also been limited to some extent by lack of good data sources, and, accordingly, some focus should also be placed on ways we can improve existing datasets and create new ones.

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Table 1: Ownership Rates by Type of Asset

Year	Housing	Stocks
2001	66.9	52.3
2004	68.4	50.3
2007	67.9	53.2
2010	64.6	49.9

Source: Survey of Consumer Finances and authors' calculations.

Notes: Table reports the percent of the population with wealth holding in housing and the stock market (including stocks held indirectly in 401(k)-type retirement accounts). Results are weighted to be nationally representative.

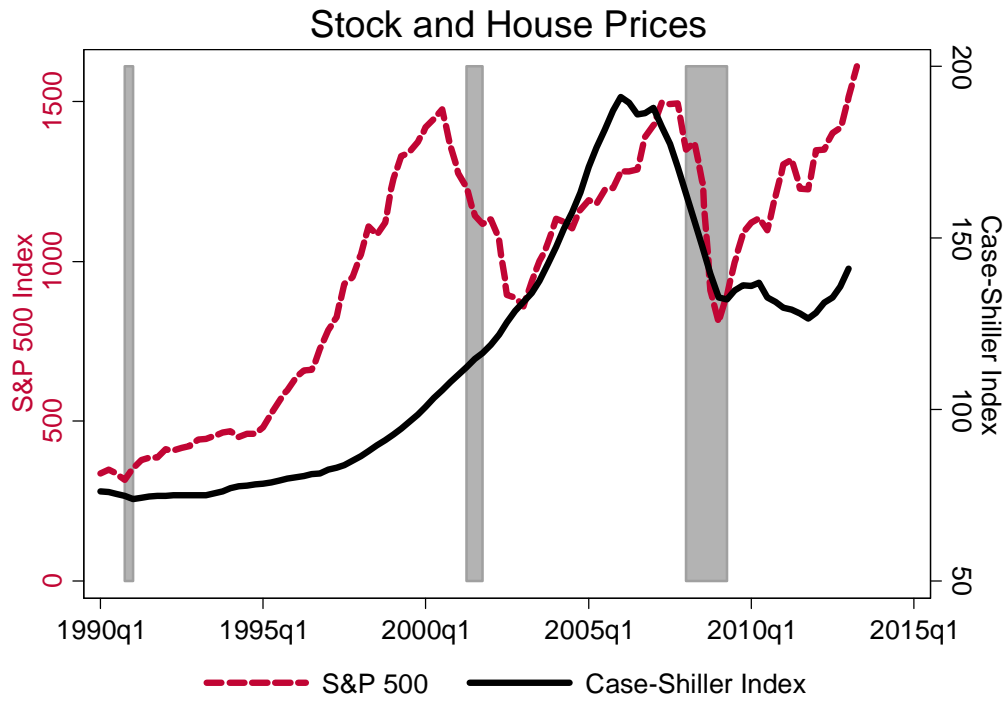
Table 2: Housing Wealth Concentration by Income Quintile

Income Quintile					
Year	1	2	3	4	5
2001	65.0	41.9	32.7	22.3	11.4
2004	73.3	51.3	37.7	28.3	11.1
2007	69.9	49.4	41.7	27.3	11.4
2010	71.0	48.3	37.6	26.3	13.6

Source: Survey of Consumer Finances and authors' calculations.

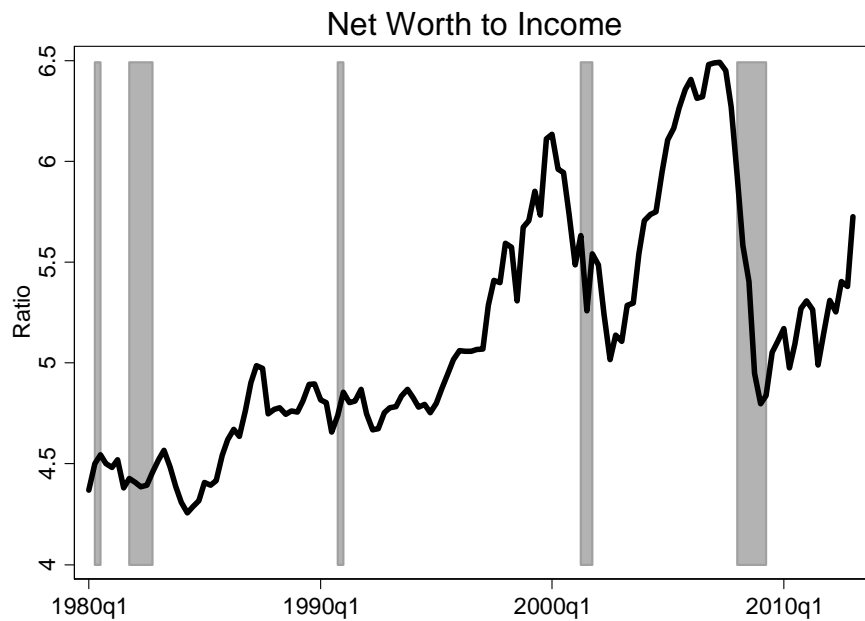
Notes: Table reports the median share of housing wealth as a percent of total wealth according to the Survey of Consumer Finances. "1" represents the lowest quintile of income in a given year and "5" represents the highest quintile.

Figure 1: Stock Prices and House Prices



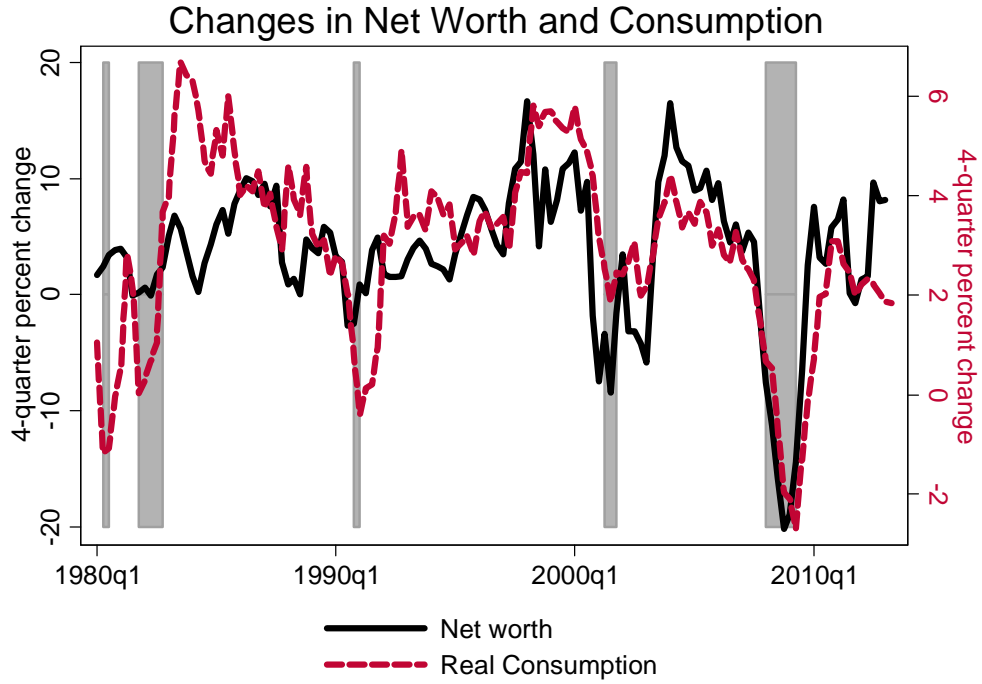
Source: Standard and Poor's, Wall Street Journal/ Haver Analytics

Figure 2: Net Worth-to-Income Ratio



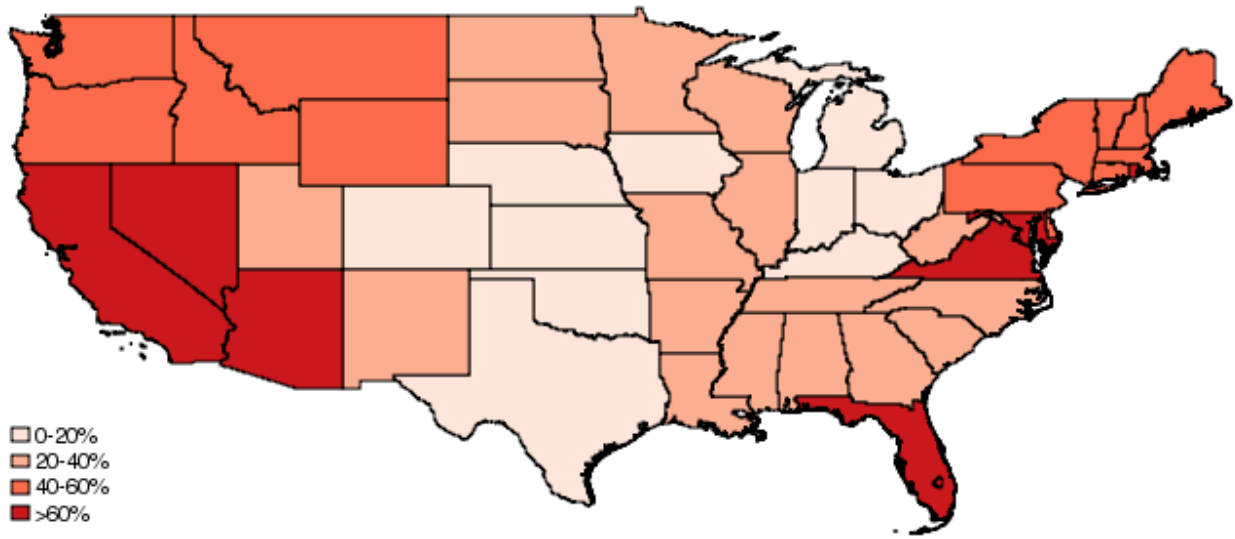
Source: Federal Reserve Board, BEA /Haver Analytics.

Figure 3: Consumption and Net Worth



Source: Federal Reserve Board, BEA /Haver Analytics.

Figure 4: House Price Changes by State (2002-2006)



Source: FHFA/Haver Analytics.