

# Household Wealth Effects and the US Macroeconomy

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## Abstract

The effect of wealth on consumption is an issue of long-standing interest to economists. Analysts believe that fluctuations in household wealth have driven major swings in economic activity. This essay considers the so-called “wealth effects”—the impact of changes in wealth on household consumption and the overall macroeconomy. There is an extensive existing literature on wealth effects, but there are also many unanswered issues and questions. This essay reviews the important issues regarding the role wealth plays in the macroeconomy and argues that there is a need for much more wealth effect research as well as better data sources for conducting such analysis.

The effect of wealth on consumption is an issue of long-standing interest to economists. The relationship has been particularly important from a policy perspective since the mid-1990s, as the US economy has since experienced two major booms and busts in stock prices, as well as a dramatic run-up and reversal of home prices. Analysts believe that the resulting fluctuations in household wealth have driven major swings in the US economic activity. Indeed, the plunge in household wealth during the financial crisis is frequently cited as contributing importantly to the unusually slow recovery of the US economy from the Great Recession.

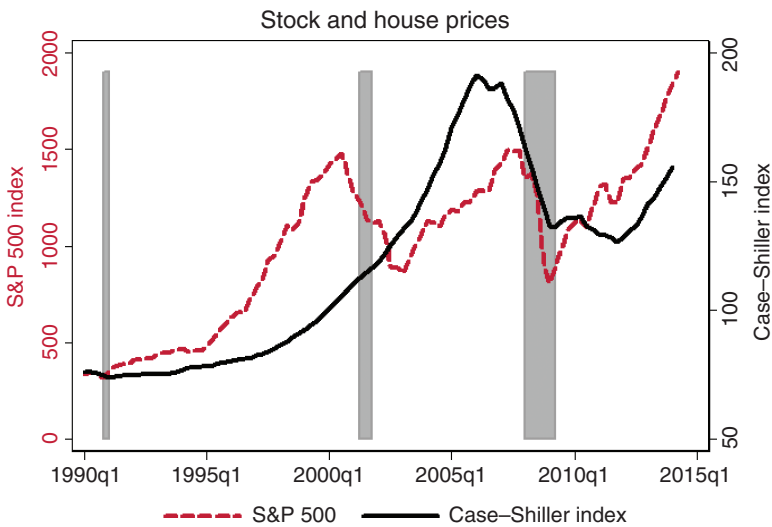
Against this backdrop, it is perhaps not surprising that a great deal of empirical research over the last 25 years has focused on the so-called “wealth effects”—the impact of changes in wealth on household consumption and the overall macroeconomy. Such studies have used different types of data to examine the relationship between wealth and household spending, including macroeconomic time series, regional data, household survey results, and credit bureau records. Despite this attention from the research community, many important questions about wealth effects remain unanswered. We

review these questions, arguing that there is a pressing need for more research in the area as well as a need to develop better data sources for such research.

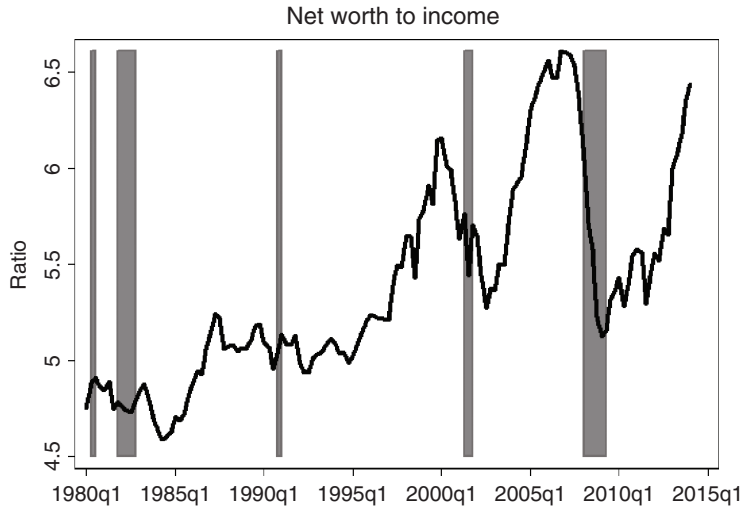
### BACKGROUND

The swings in the US household wealth over the last two decades began with a run-up in stock prices in the late 1990s, as shown in Figure 1, driven in large part by optimism over the potential for new technologies to raise the productivity of US businesses. Market confidence collapsed in early 2000, and stock prices subsequently retreated as the US economy experienced a mild recession. By mid-2003, though, 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 proved to be transitory. Home prices, which had risen well above the levels justified by fundamentals, began to edge down in 2006 and were sharply declining by the following year. Delinquency rates on mortgages rose, starting with the so-called “affordable” mortgages, many of which were fundamentally unsustainable in the absence of continued home price appreciation, leading to a tightening of credit conditions, further investor losses, and, ultimately, 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%



**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.

from its peak, and the value of real estate owned by households was down roughly 25%.

The evolution of US 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 6.2 at its peak around 2000. After taking back most of these gains in the early 2000s, the ratio shot up again during the housing boom, reaching 6.5 in 2006 before tumbling to its lowest level in about 15 years. The recovery in stock prices since their low point in early 2009 has brought the ratio of household wealth-to-income back up to a level roughly comparable to 1997.

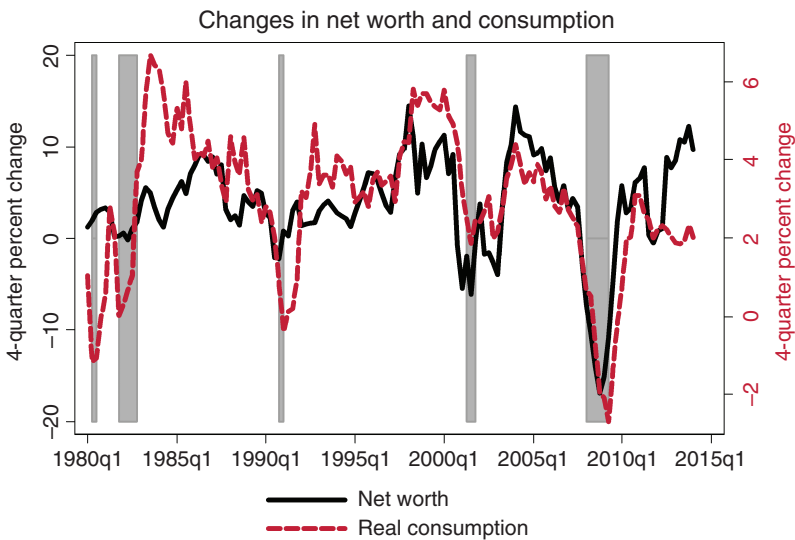
According to conventional wisdom, these swings in household wealth have been important drivers of economic activity in the United States, and policy-related discussions often reference the relationship. For example, in its February 1996 *Monetary Policy Report to Congress*, the Federal Reserve noted, “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.” In a 2002 speech, then Federal Reserve Governor Edward Gramlich remarked, “...the link between aggregate household wealth and spending has remained one of the sturdier empirical relationships in macroeconomics.” The 2013 *Economic Report of the President* stated, “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 hiring, lay off valued employees, and halt investment plans.”

### ESTIMATING WEALTH EFFECTS USING MACRO DATA: BASIC RESULTS AND LIMITATIONS

Standard economic theory (the Permanent Income Hypothesis) offers a framework for thinking about wealth effects. In particular, households should consume a constant fraction of their (appropriately calculated) lifetime resources. Changes in wealth that permanently alter the households’ lifetime resources therefore should cause consumption to change. 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 (Figure 3).

More formal modeling of the relationship between aggregate consumption and aggregate household wealth has produced estimates of the timing and magnitude of the wealth effect. Davis and Palumbo (2001) present an analysis based on typical consumption 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 Carroll, Otsuka, & Slacalek, 2011).



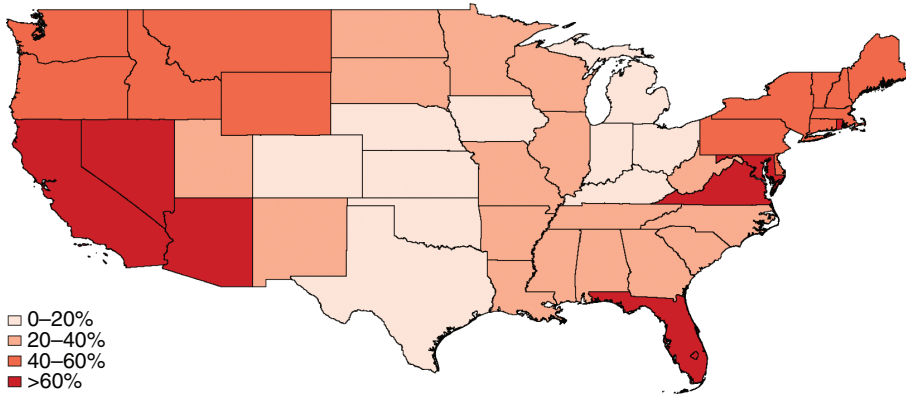
**Figure 3** Consumption and net worth. *Source:* Federal Reserve Board, BEA/Haver Analytics.

While macroeconometric models provide useful guidance on the average historical relationship between aggregate consumption and wealth, they also have limitations. In particular, the degree to which the models are useful for forecasting aggregate consumption dynamics or uncovering key economic relationships depends on the degree to which household behavior is homogeneous as well as the degree to which changes to the economic environment are distributed evenly and consistently over time. In practice, these conditions are not met: the actual economy is characterized by heterogeneity that is not consistent over time.

In the existing wealth effects literature, much attention has focused on credit constraints as a potential source of heterogeneity in how different households respond to changes in wealth. In particular, households that are consuming at a suboptimal level because they cannot borrow as much as they desire should have a particularly powerful consumption response to wealth gains (at least to the extent that those gains can be liquefied). Indeed, Lehnert (2004) estimated higher propensities to consume out of housing wealth for younger US households than their older counterparts, arguing that the former group was the most likely to be constrained. Bostic, Gabriel, and Painter (2009) also find that borrowing constraints impact the relationship between wealth and consumption. In a somewhat more recent work, Cooper (2013) used several alternative approaches to show that borrowing constraints heighten the relationship between consumption and housing wealth in US household-level data. Finally, using spending and balance sheet data at the regional level, Mian, Rao, and Sufi (2013) find substantially higher propensities to consume for poorer and more levered households—again, the groups most likely to be constrained. Although the precise results differ from essay to essay, the findings in these studies are strongly consistent with the view that housing wealth effects are larger for households that are more likely to be facing borrowing constraints (see also Case, Quigley, & Shiller, 2005, 2011, 2013).

The geographic dispersion of the housing wealth movements over 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, which should affect the response of consumption to wealth (e.g., one might expect a stronger effect in states where people are in demographic groups more likely to be borrowing constrained).

These types of heterogeneity do not in and of themselves invalidate analyses of wealth effects based on macroeconomic models. If aggregate wealth changes always had the same distribution across people and space, then the



**Figure 4** House price changes by state (2002–2006). *Source:* FHFA/Haver Analytics.

estimated coefficients from the models—which 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, varying because of differences in the types of wealth held and also because the fraction of people having a certain trait (such as being borrowing constrained) can change. The spatial dispersion of wealth shocks also varies over time. For example, real house prices surged 39% in the Boston Metropolitan Statistical Area (MSA) between 1984 and 1986 as part of a coastal housing boom at that time. In comparison, real house price appreciation was only about 8.5% in the Chicago MSA and 4.3% in the Kansas City MSA over this period.

#### KEY UNRESOLVED ISSUES REGARDING WEALTH EFFECTS

The previous discussion of the limitations of the standard approach to modeling wealth effects highlights the need to know much more about the underpinnings of wealth effects at the household level. In this section, we discuss the outstanding questions that are most important from a policy perspective, reviewing where the literature currently stands and where more research would be helpful.

#### IS HOUSING WEALTH REALLY WEALTH?

The recent boom and bust in US 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. To this point, Buitier (2010) argues that housing wealth is not really wealth. The underlying intuition is that housing wealth differs from other household (financial) wealth, because it serves both as an asset and as a consumption good. As a result, when home prices rise, the ownership (or rental) costs of housing also increase.

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 nonhousing goods in order to offset the higher cost of their shelter. The impact of home appreciation on homeowners is less clear, as higher housing costs require homeowners to decrease their nonhousing consumption for a given amount of income, but they receive an offsetting capital gain from the higher home prices. 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 house prices move together; so, homeowners' actual wealth gains from house price appreciation may be small or nonexistent. Moreover, homeowners may have to reoptimize and downsize their housing stock in order to fully realize their gains for consumption purposes—something that many owners may not be willing to do, given transaction costs and other factors, especially in the short-term.

Housing wealth may, however, impact consumption *indirectly* through its role as borrowing collateral. When home prices rise, the value of homeowners' collateral increases, and they can borrow against their additional home equity such that they can spend more on goods and services (including home improvements) and meet other financial needs. Previously constrained homeowners are therefore likely to increase their spending when house prices rise. In the data, this borrowing collateral effect should show up as a positive relationship between housing wealth and consumption.

Further, as Case, Quigley, and Shiller (2013) argue, homeowners may increase their consumption in response to housing appreciation for psychological reasons. That is, they may respond to societal perceptions that housing gains make them better off or they may be myopic and fail to consider that if everyone in their area experiences similar housing gains they are not necessarily any better off.

At the aggregate level, we might also expect to see changes in housing wealth have a different effect on consumption than changes in financial wealth because of its different distribution across households. Table 1 shows that roughly two-thirds of households own homes, while only about half hold stocks (including stocks held indirectly through mutual funds, defined-contribution retirement plans, and the like). The data come from the Survey of Consumer Finances (SCF), weighted to be nationally representative. Because the SCF oversamples wealthy households who are

**Table 1**  
Ownership Rates by the 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: The table reports the percent of the population with wealth holdings 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: The 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 the household income distribution in a given year and "5" represents the highest quintile.

the most likely to hold stocks, the data are viewed as being particularly accurate for these types of comparisons. 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. Because lower-income households are more likely to be credit-constrained and myopic than higher-income households, the higher housing wealth concentration in the lower parts of the income distribution should tend to make the aggregate marginal propensity to consume out of housing wealth higher than the marginal propensity to consume out of financial wealth.

Taken together, these various considerations suggest that the housing wealth effect could be larger or smaller than the effect associated with financial wealth. As a result, the differential impact is largely an empirical question. Although this question has 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, based on the credit-record evidence on the amount of housing capital gains that were liquefied during the housing boom, Mian and Sufi (2011) also concluded that housing wealth effects are very large. In contrast, Cooper (2013) finds slightly larger *financial* wealth effects than housing wealth effects after paying particular attention to the borrowing collateral role of housing wealth. De Bonis and Silvestrini (2012) also found larger financial asset effects than real (housing) wealth effects on consumption, using a panel of OECD countries.

The empirical results regarding the relative sizes of the financial wealth and housing wealth effects are thus mixed. These differences matter for thinking about the interaction between wealth and the macroeconomy, because the vast majority of forecast models follow Thaler's (1990) assumption that assets are fungible and money is money. More empirical work is therefore needed to determine whether assets are not fungible, and, if so, what is the mechanism causing one to matter more than another.

If households indeed have different propensities to consume out of one type of wealth than another, accurate forecasting of US macroeconomic growth will require taking account of differential movements in the components of wealth. Conventional consumption models typically include total wealth rather than its pieces. This means that the coefficient on wealth reflects the average experience over time, which will, in turn, reflect the average historical "driver" of aggregate wealth movements that may be higher or lower than the propensity to consume out of a given component of wealth.

#### 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 (e.g., younger households with plans to begin saving for retirement) to purchase them at a higher price. Second, some recent evidence suggests that individuals might respond anomalously to stock market gains realized in defined-contribution pension accounts because of behavioral considerations. In particular, Choi, Laibson, Madrian, and Metrick (2009) find that individuals tend to raise their retirement plan contributions after experiencing good returns; if these higher contributions are funded by reduced consumption, one would see a wealth effect in the opposite direction of 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 of consumption on wealth but rather from a signaling channel. In particular, because 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 and not necessarily to stock price fluctuations.

The standard empirical approach for investigating the impact of stock price fluctuations on consumption is to examine whether stockholders have a different response to stock price increases than nonstockholders. A more pronounced consumption effect for stockholders than nonstockholders is consistent with stock prices having a direct impact on consumption. 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 similar results for a broader measure of consumption. Maki and Palumbo (2001) examine data on saving and capital gains 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 the stock market wealth effect question over the past decade, presumably because the focus of the empirical wealth effects literature has shifted to the housing area. However, Dynan (2010) finds preliminary evidence that incorporating more recent household-level data into the analyses of the differential behavior of stockholders and nonstockholders considerably weakens earlier results. Given that the dramatic swings in stock prices since the late 1990s offer much more opportunity to identify the underpinnings of stock market wealth effect, more research should revisit the earlier findings.

#### WEALTH EFFECTS AND HOUSEHOLD DEBT

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 sluggish performance of the US economy in recent years—in combination with the high levels of household debt and leverage among US households that emerged from the mortgage boom and bust—have drawn attention to the issue of whether household debt levels held back consumption during the economic recovery. If debt matters for fluctuations in household spending, macroeconomists should take account of debt-related developments in addition to looking at the movements in the overall household wealth.

The theoretical case for debt holding down consumption is not completely clear, as the traditional models used by macroeconomists suggest that debt does not exert an independent influence on consumption beyond debt-related movements in household net worth. A case can be made, however, for why household debt matters for consumption beyond net worth for several reasons. 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 might have been forced to reduce their consumption, because their high levels of debt relative to income or assets prevented them from obtaining any further credit that they might have needed to finance their desired spending.

Turning to the empirical literature, Cooper (2012) finds that aggregate US consumption did not behave particularly unusually during and following the Great Recession, 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, however, this relationship existed before the Great Recession, suggesting that the recent period is not particularly unusual. Even so, debt could have had a larger impact on consumption recently, as more households are burdened by high debt and leverage compared with earlier periods. In addition, Dynan and Edelberg (2013) found that high-debt households were more likely to report scaling back their consumption in 2009, again after controlling for other drivers of spending. Finally, as noted earlier, regional data analysis of Mian, Rao, and Sufi (2013) concluded that leverage helped amplify the negative effect on consumption from 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 weak performance of the economy 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 in the existing analysis of the relationship between household debt and consumption suggest many promising avenues for further research. Some preliminary steps in understanding the relationship theoretically have been taken (see, e.g., Eggertsson & Krugman, 2012), but more work is needed to realistically characterize the complex linkages found in the actual economy.

#### HAS THE WEALTH EFFECT CHANGED OVER TIME?

As noted above, if the response of household spending to changes in wealth differs by the type of wealth, then one should expect to see the strength of the aggregate wealth effect to be different, depending on the underlying source of a given movement 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, the size of the aggregate wealth effect may have changed because of demographics. In principle, older households with shorter remaining life horizons over which to spend changes in their wealth 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' consumption planning horizons actually do depend on their expected remaining life span. If households take a dynastic view and intend to share their wealth gains with their descendants, then their consumption response may be more muted. But, generally, the role of households' age in determining their consumption response to wealth fluctuations implies that the aging of the baby boom should tend to increase the aggregate marginal propensity to consume out of wealth.

Financial innovation may have also changed the link between wealth and consumption. In the decades preceding the 2008–2009 financial crisis, technological advances and institutional developments (including regulatory and tax code changes) reduced credit constraints, increasing access and lowering the cost of borrowing. But, 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, because, as discussed above, the empirical evidence suggests that credit constraints tend to be associated with a stronger wealth effect. On the other hand, financial innovation made it easier and cheaper to liquefy housing wealth through home equity loans and cash-out refinancing transactions, such that constrained households could borrow more easily against housing capital gains. By itself, this 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 has been around 50% since 2000 (Table 1), it was only a little more than 30% in the late 1980s (Dynan, 2009). As a result, more stock is held by lower-income households that likely have higher marginal propensities to consume. All else equal, this should have increased 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. Household spending could also fall, as discussed above, in the face of capital gains if households are “chasing returns.”

All told, many factors might 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 analysts at Credit Suisse (2013) showed that the estimated wealth effects for both housing and financial wealth were smaller when postfinancial 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 time periods. However, researchers should be able to draw inferences on how the coefficients might have changed in response to these developments using household-level or regional data, where the price variation is much richer.

## DATA CHALLENGES

As has been discussed throughout this essay, US macroeconomic data are not very useful for establishing the empirical relationship between wealth and consumption. The variation is limited, which hinders identification, particularly when relationships are changing over time and the determinants of consumption are interrelated.

Household-level datasets tend to be much richer in scope and have many data points, such that there is much more opportunity for identification. Yet, these data also 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 US Panel Study on Income Dynamics and the US 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-level

data are also not without identification issues, but these issues can be circumvented by, for instance, looking at the effects across different groups of households. (See Cooper, 2013, 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 level and then combined them with regional information related to consumption, income, and wealth in order to do more complete analyses. This approach shows promise and should be explored more fully. However, identification with regional data may always be impaired, because the set of covariates is simply not as rich as it would be in household survey data. For example, there is no data source in the United States that would offer complete information about wealth by region. An ideal solution might be to merge the less noisy administrative data into household surveys, based on available overlapping variables, in order to have the best of all worlds.

## CONCLUSION

To date, there has been much interesting research on and debate surrounding the influence of wealth shocks on macroeconomic dynamics. Much is yet 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 substantial asset price fluctuations.

We have identified a need to learn more about the underpinnings of wealth effects in the United States and how the effects might differ for different components of household wealth, including the liabilities side of the balance sheet. Relatedly, more work is needed to understand how aggregate wealth effects may have changed (and still be changing) over time. The research has been limited to some extent by a lack of good data sources, and, accordingly, some focus should be on ways we can improve the existing datasets and create new ones.

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