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JEL classification: D12, G01, G21

### **Abstract**

Since the onset of the 2008 financial crisis, consumer financial and borrowing behavior, once considered a relatively quiet little corner of finance, has been of enormously increased interest to policymakers and researchers alike. Prior to the Great Recession, there was a historic run-up in household debt, driven primarily by housing debt, which coincided with a speculative bubble and sharp rises in home prices. Then, as prices began to fall, millions of households began defaulting on their mortgages, unable to keep up with home payments, and greatly contributing to the onset of the deepest recession since the 1930s. Following the steep increase in debt balances during the boom, households began rapidly paying off their loans during and immediately after the Great Recession. Since 2013, debt has begun to increase and eventually rise above its previous levels, albeit at a much slower rate than before, at least partially owing to stricter lending standards. We examine the trends in household debt before, during, and since the 2000s financial crisis and Great Recession. As we will show, this period is unique in American history in several ways. Our analysis will show the sources of the historic run-up in debt during the bubble period of the early 2000s, the change in borrowing behavior that took place as the financial crisis and Great Recession took hold, and the nature of the recovery that began in 2013. We find that while total household debt has recovered to its previous level in nominal terms, its composition and characteristics have changed dramatically along many dimensions.

Key words: household finance, consumer, debt

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[https://www.newyorkfed.org/research/staff\\_reports/sr882.html](https://www.newyorkfed.org/research/staff_reports/sr882.html).

## Data

Our primary source of data is the New York Fed’s Consumer Credit Panel (CCP). The CCP contains information from a large, representative sample of consumer credit reports from Equifax, one of three national credit reporting agencies. The data are reported quarterly, from 1999Q1 to the present.<sup>1</sup> While this feature is not a critical part of the analysis presented here, the data are very timely: updates are typically available within two months of the end of a quarter. Thus the data for 2018Q3 were posted in November 2018. The individuals in the primary sample are selected using the randomly-assigned last two digits of their social security number, producing a dynamically-updated panel dataset that is representative of the population at every point in time.<sup>2</sup> The population from which the sample is drawn is thus individuals with a credit report and a social security number. In addition to the primary sample, the data include a household sample that provides the same information on all those persons with credit reports who reside at the same address as the individuals in the primary sample. Generally speaking, a credit report will exist for individuals who have obtained or sought loans from the formal financial sector, including the government. Altogether, the CCP captures the credit reports of more than 45 million Americans as of mid-2018.

The CCP contains detailed information drawn from each individual’s Equifax credit report. The data include information on loan accounts, public record and collection accounts, and some basic demographic information. For loan accounts, the data include balance, presence and extent of delinquencies, and payment information for each type of loan that each borrower holds at each point in time. Nearly all loan balances (roughly 97%) fall into five borrowing categories:<sup>3</sup>

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<sup>1</sup> As of this writing, the data are available through the third quarter of 2018; our analysis goes through 2018Q2. Updated information from the dataset is reported in the [Quarterly Report on Household Debt and Credit](#), hosted on the [New York Fed’s Center for Microeconomic Data](#).

<sup>2</sup> See Lee and van der Klaauw (2010) for more details about the sampling design and content of the CCP.

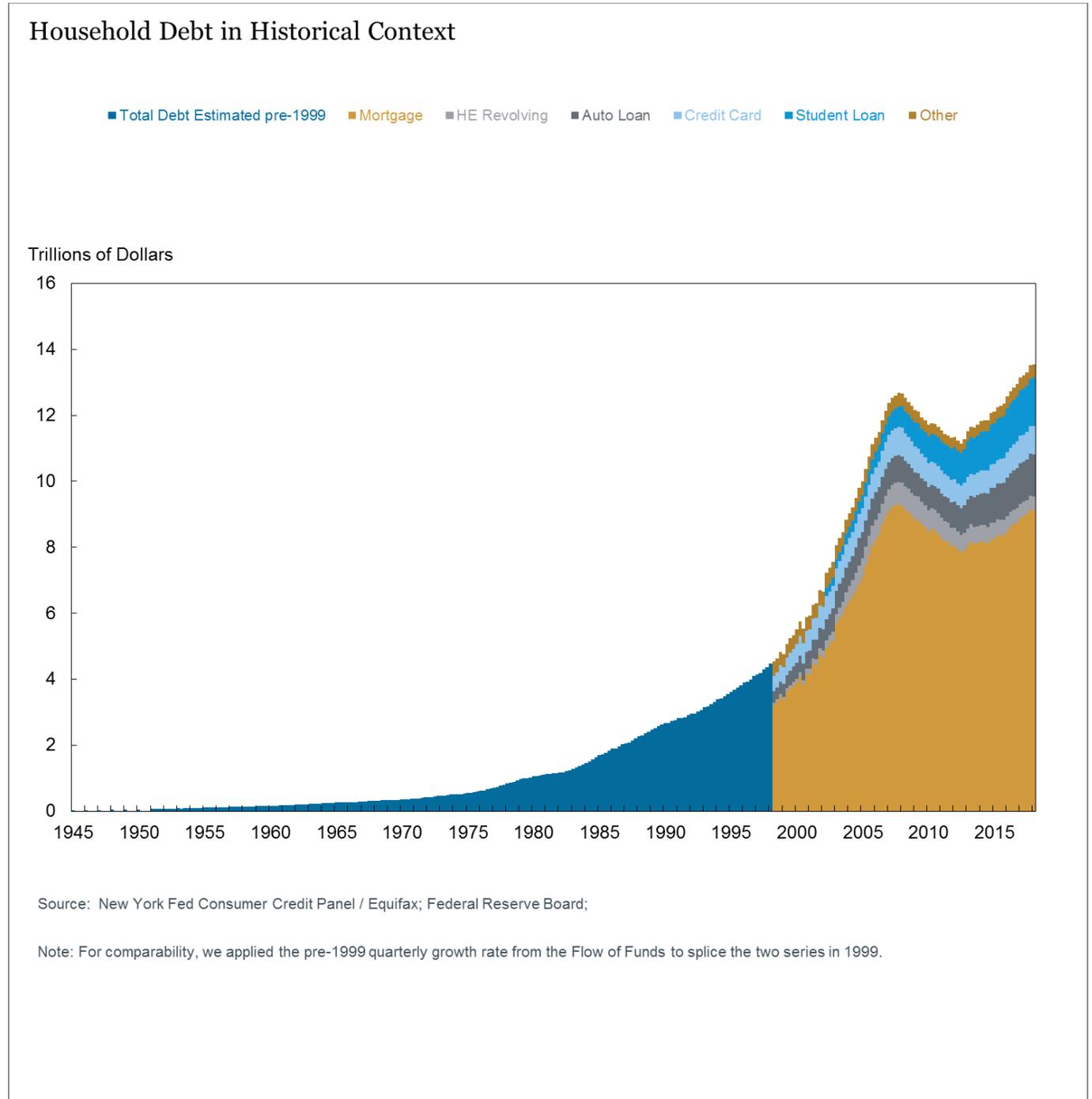
<sup>3</sup> The remaining 3% is in a category referred to as “other,” and includes such obligations as sales financing loans, personal loans and retail credit cards.

- mortgages (first mortgages and home equity installment loans, sometimes referred to as closed-end second mortgages), secured by housing collateral;
- home equity revolving loans, sometimes referred to as Home Equity Lines of Credit (HELOCs), and secured by home equity;
- auto loans (including automobile leases);
- bank credit cards, and
- student loans.

The level of data aggregation varies depending on the type of loan involved. The CCP reports information on up to 19 individual mortgages, including both first mortgage and home equity installment loans, and 5 home equity lines of credit; the data also include aggregates for each housing loan type. This allows very detailed analysis of housing debt, which has historically been far and away the most important household obligation. In 2018Q2, housing debt comprised 71% of total household debt. The CCP also includes information on individual student loans. It is thus possible, for mortgages, HELOCs and student loans, to track individual obligations, as well as the individuals who are responsible for them, over time.

For credit cards and auto loans, data are reported at the individual borrower level. Thus we may see that a specific individual has three credit cards, with a total balance of \$10,000 and a credit limit of \$15,000, but we will not know the balance or limit on a specific card. The dataset also encompasses information on foreclosures, bankruptcies, loans and other accounts in collections. Finally, a short list of individual characteristics: geographic location (down to the census block), birth year, and each individual's Equifax Risk Score, a summary statistic intended to predict how risky a given borrower is, analogous to the well-known FICO risk score. The records are thoroughly anonymized, making it impossible to identify individuals in the data.

Figure 1



In Figure 1, we combine 1999-2018 data from the CCP with the considerably longer, but less detailed, data from the Federal Reserve Board's [Financial Accounts of the United States](#).<sup>4</sup> What is immediately apparent in the figure is the dramatic and unprecedented nature of the events of the 2000s relative to the rest of the post-war history of US household debt. As can be seen in Figure 1, nominal household debt has increased quite steadily since WWII, with the very notable exception of the 2008-2012 period. Indeed, debt increased in all but 8 of the 227 quarters between 1951Q1 and 2008Q3, and in no case did it decline for two quarters in a row; growth versus a year earlier was positive in literally every quarter.

Less obvious because of the scale of the figure is that throughout much of the postwar period, debt has grown rapidly. During the 1950s, for example, nominal debt increased from \$47 billion to \$152 billion, a compound rate of 12.5% per year. Double digit year-over-year percentage increases in the series have been fairly common historically, including a string of 21 consecutive quarters between mid-2002 and mid-2007.<sup>5</sup> Notably, debt grew through strong national economic expansions (+105% between 1991Q1 and 2000Q4 for a 7.3% compound annual growth rate [CAGR]) and recessions (an average 3% CAGR during the 1990-91 and 2001 recessions).

The strong increase in debt during the 2000-2006 period was associated with the housing bubble that was inflating during that period. Figure 2 shows the steady path of house price increases through 2006, with a strong upward trend in price changes with increases exceeding an annual rate of 10% between late 2003 and early 2006. Mortgage and HELOC balances led the increases in household debt during the early 2000s, as these two forms of housing-secured debt more than tripled from \$3.3

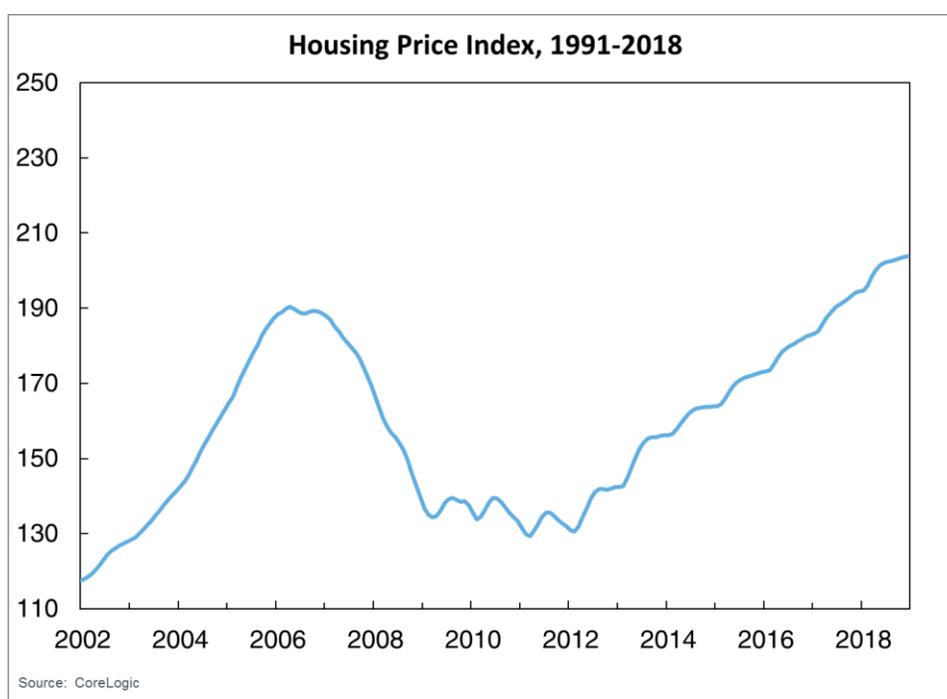
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<sup>4</sup> This series, previously known as the *Flow of Funds*, provides [aggregate debt statistics for households and non-profits](#). Since this dataset measures a slightly different concept of debt than the CCP, which is confined to households, we produce a simulated national accounts series by backwards applying reported rates of change in the Flow of Funds to the 1999 CCP data. Student debt is excluded from the CCP figures prior to 2003 at which point it represented approximately 3% of total household debt. See Haughwout et al. 2017 for further detail.

<sup>5</sup> Excluding student debt, which is included in the CCP data only after 2003, the figure is 20 of 21 quarters, since the rate in 2003Q3 was 9.2%.

trillion (72% of the total) in 1999 to almost \$10 trillion (78%) by 2008Q3. Other debt rose as well, from \$1.3 to \$2.7 trillion: substantial increases but not nearly as large in either percentage or dollar terms as those seen in the housing-related space. Overall, rising housing debt comprised over 80% of the increase in household debt that occurred during the 1999-2008 credit boom. While mortgage debt was overwhelmingly the main contributor to the rise in housing debt in dollar terms, HELOCs grew faster – HELOC debt in 2008Q3 was 765% of its 1999Q1 level – a more than eight-fold increase.

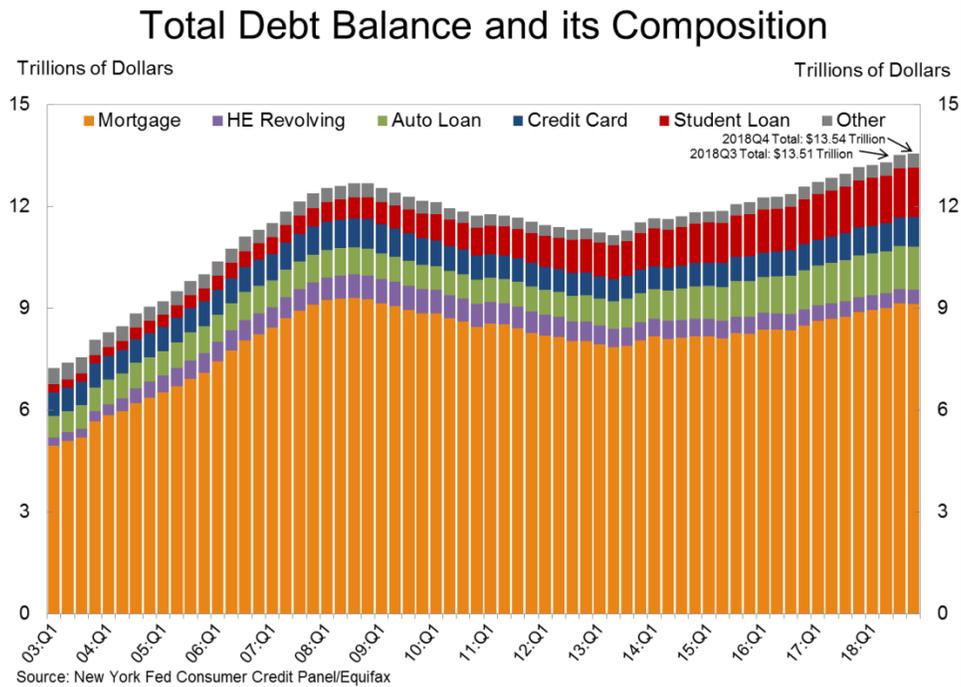
Figure 2



The phase that commenced in the second half of 2008 – in the period following the downturn in home prices in early 2007, the collapse of Lehman Brothers and the onset of the financial crisis – featured an unwinding of part of the debt increase that had occurred during the previous decade. It is this period – not the borrowing boom which preceded it – that is the most striking break from the historical pattern in Figure 1. Indeed, the “Great Deleveraging” that took place between 2008 and 2013 was truly unprecedented historically: starting in 2008Q4, debt declined for nine consecutive quarters. In the previous 63 years (255 quarters), debt had never declined in consecutive quarters in nominal terms.

Zooming in on Figure 1 with a shorter time period, we are better able to view the composition of household debt balances by product in Figure 3, in which several things are clear. First, total household debt is dominated by housing debt, which comprises over two-thirds of the total. Second, household debt is dominated by housing debt, which comprises over two-thirds of the total. Second, there is a strong cycle in mortgage debt which drives the cycle in total household borrowing. Third, auto and credit card debt follow a pattern similar to that in housing debt, rising and then falling. Finally, there is a strong upward trend in the amount of student debt outstanding, shown in red, which appears to be impervious to the overall pattern.

Figure 3



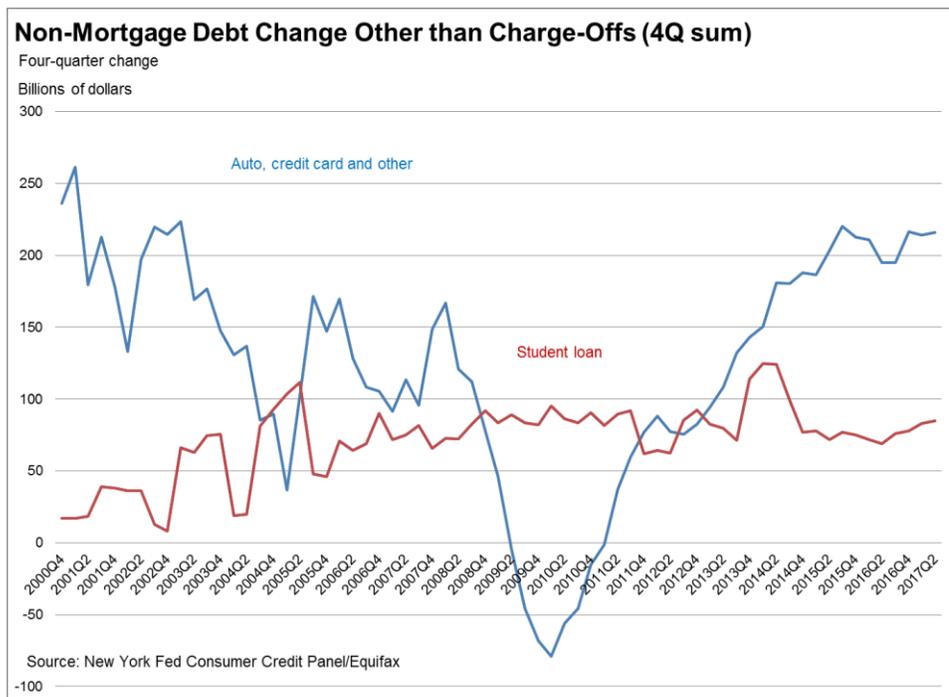
## Decomposing the Borrowing Cycle

These facts about the important role of housing in the borrowing boom of the first part of the 2000s suggest that a focus on the evolution of mortgages and HELOCs will shed light on household behavior and, potentially, the dynamics that led to and contributed to the financial crisis that began in late 2008.

In this section, we trace out the sources of balance changes during the first part of the 2000s, the deleveraging period, and the recent return to positive debt growth.

Changes in outstanding debt figures are the net result of a complex set of borrower activities – new borrowing, scheduled repayment as well as prepayment of outstanding balances, and defaults resulting in balance declines from charge-offs balances. In Figure 4 and Figure 5, we decompose the aggregate balance change into some of these channels, to isolate different behavioral patterns that are relevant to understanding household behavior during the boom, bust and recovery.

Figure 4



Turning first to Figure 4, we focus on four-quarter growth in non-housing debt, after removing the effect of charge-offs associated with defaults.<sup>6</sup> We further decompose the changes in these obligations into student loan and other debt. The reason for this is apparent from the figure: while there is evidence of a strong credit cycle in the blue line (auto, credit card and other debt), annual student

<sup>6</sup> We remove the effects of default to determine whether any deleveraging that occurred during the 2008-2011 period was through the scheduled repayment of debt, or whether it was all accomplished through defaults.

debt growth was consistently positive. After about 2005 growth in student debt is also remarkably steady at around \$75 billion per year. In spite of a severe recession and a general deleveraging in the household sector, borrowing to fund educational expenses has been a steady contributor to outstanding household debt balances. We will return to the remarkable steadiness of student borrowing later.

Auto, credit card and other debt displays no such stability. Here we see strong direct evidence of the credit cycle, and perhaps indirect evidence of the use of housing wealth to fund general consumption. After frequently exceeding \$200 billion in annual growth during the 2000-2003 period, net borrowing in this category stepped down to about \$100-\$150 billion from 2003-2008. We interpret these figures as net new borrowing, excluding the effect of defaults, used to finance vehicle leases and purchases (auto debt), and general consumption (credit card debt and other). The fact that these kinds of new borrowing seem to have declined as the housing boom reached its peak in 2003-2006 and the economy grew faster overall is suggestive of the use of relatively lower-cost housing debt in place of auto and credit card borrowing. While somewhat reduced after 2003, these forms of borrowing on net continue to be strongly positive until 2008, when they suddenly drop below zero. This reduction in balances outside of the default process results from actual paydown of debt by borrowers, which directly reduces the resources available for spending on cars and other elements of the household consumption basket.

One mechanism by which large declines in non-mortgage debt was accomplished was account closings, shown in Figure 5. During the recession, on net, 120 million credit card accounts were closed. Figure 5 also indicates the lack of new accounts to replace those that were closed.

Were lenders restricting credit and closing accounts, or were consumers voluntarily closing and not opening new ones? Fortunately, the CCP can offer some clues to this puzzle. During the recession and the following months, the number of accounts closed within the previous 12 months spiked from 2008 to 2010, with a high of 375 million accounts reported closed over the past 12 months at the end of

2009Q3. The number of accounts opened maintained a steady pace prior to the recession, but began a decline in 2008 that continued through 2010. At its trough, new account openings had dropped nearly 40% to 158 million in 2010Q3 from their peak of roughly 250 million per quarter from 2005Q3 to 2007Q3.

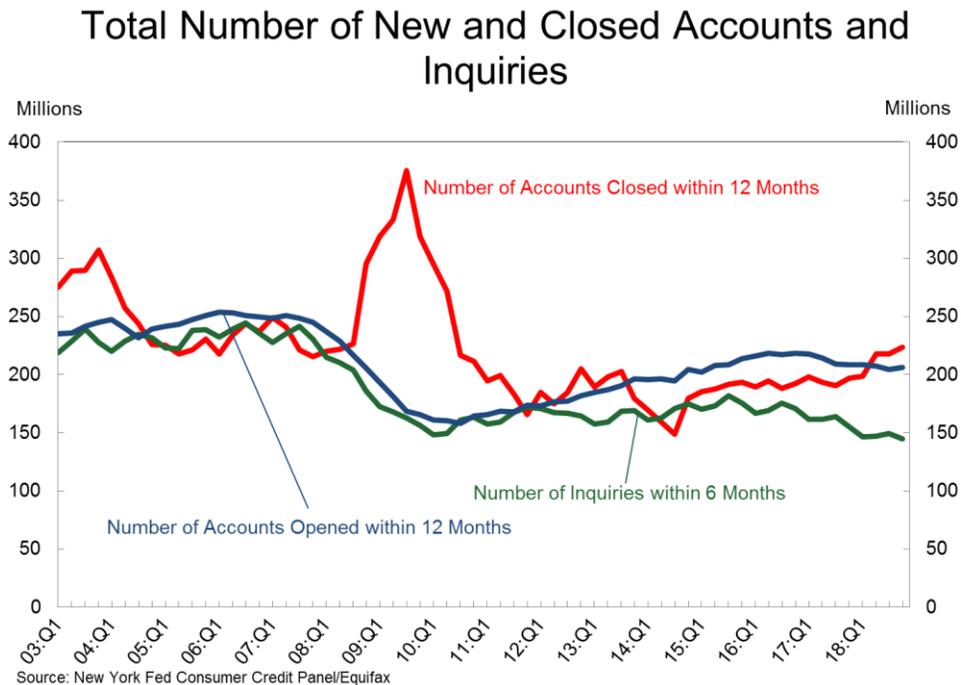
These patterns could be a result of either supply or demand; lenders may have tightened their standards, while consumers were most likely reluctant to take on new debt in such a vulnerable time. We can shed a light on this picture by looking at the number of inquiries reported to Equifax, which reflect applications for new credit accounts and which are also reported in Figure 5.<sup>7</sup> Holding the quality of applicants constant, if inquiries remained stable while the number of new accounts declined, we could infer that the reduction in credit was mainly due to stricter lending standards. On the other hand, if the number of inquiries, adjusted for quality of applicant, followed the path of account openings, then part of the decline in debt was due to consumers applying for less credit. Of course, it is important to note that this does not fully disaggregate supply and demand; while consumers may decrease their credit applications, and thus the number of credit inquiries, due to a decrease in demand, they may also be responding to perceived tighter lending standards.

Figure 5 also shows the number of inquiries closely tracks the number of new accounts opened. Similar to the rate of new account openings, the number of inquiries dropped from a steady 240 million annual inquiries rate to a trough of 150 million in 2010Q2, before bouncing back. This suggests that the decrease in new accounts was due at least in part to a drop in credit applications by borrowers.

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<sup>7</sup> While capturing all account openings, not all inquiries are sent to and recorded by all three credit bureaus. Assuming stability in the share of inquiries reported to Equifax, the pattern shown in Figure 5 accurately portrays the overall trend in credit account applications.

Figure 5



However, some data do suggest that lenders did indeed tighten their lending standards.

Aggregate credit limits for credit cards, which may represent the amount of risk a lender is willing to tolerate (higher credit limit = higher risk) dropped at much higher rates than aggregate balances, see Figure 6. Credit card limits decreased from a high of \$3.7 trillion in 2008Q3 to \$2.6 trillion in the fourth quarter of 2010, a 30% drop; over the same period, balances only dropped 15%, from \$858 to \$730 billion; tightening is also observed in the credit score distribution of credit card borrowers.<sup>8</sup> In the auto market, the median credit score for auto loan originations shifted up slightly from the low 680s in 2005-2007 to just over 710 in 2009-10—soon followed by a return to the 690s in the early 2010s.

<sup>8</sup> See “Campbell, G., A. Haughwout, D. Lee, J. Scally and W. van der Klaauw, 2016. “[Just Released: Recent Developments in Consumer Credit Card Borrowing](#),” *Liberty Street Economics*, August 9.

Figure 6

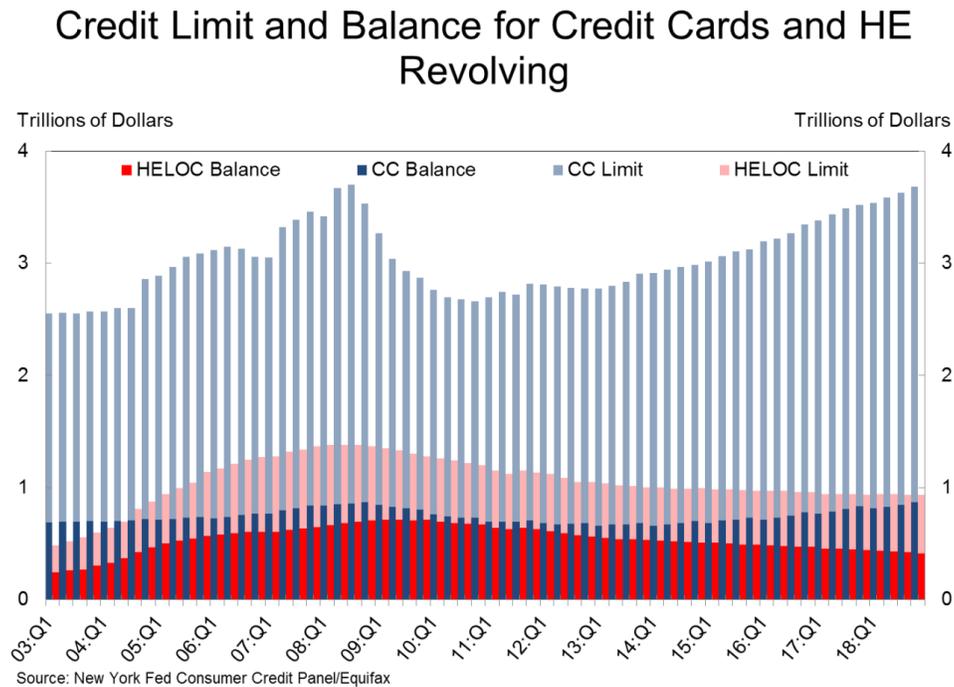


Figure 7 shows a similar decomposition for housing-related debt. Here, we explicitly show, in the red line, the effect of charge-offs, which we had suppressed in Figure 4. Unsurprisingly, charge-offs have an increasingly negative effect on mortgage balances from 2006 to 2010, reaching nearly \$360 billion in the four quarters ending 2010Q4. After that, the effects of the foreclosure crisis begin to fade, although charge-offs remained an important negative contributor to the change in debt outstanding through 2014.

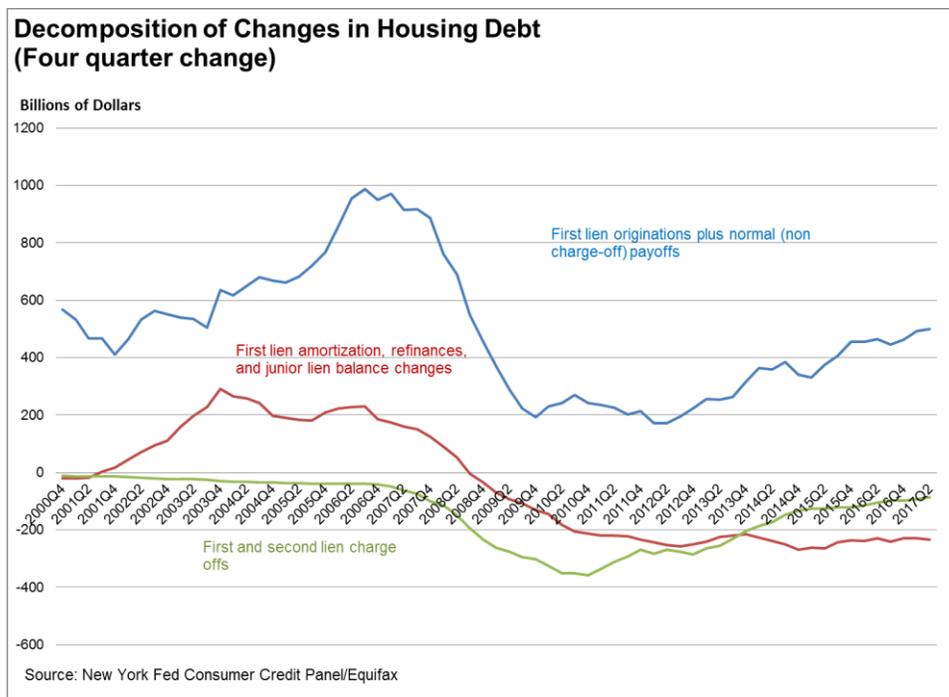
The blue line in Figure 7 depicts the change in mortgage balances that is attributable to the buying and selling of homes. Home buying has a positive effect on balances for two primary reasons:

- (1) Even with constant loan-to-value ratios (LTVs), the loan size required to buy a home will get larger as prices rise over time.

(2) The seller's LTV is on average lower than the buyer's LTV, since the seller has typically paid down some of the balance on the loan.<sup>9</sup>

While these reasons ensure that home buying activity will generate positive effects on outstanding balances, their strength clearly varies over time, producing a strong cyclicity in the blue line in Figure 7. The rapid decline in the annualized purchase contribution from nearly a trillion dollars in 2006 to below \$200 billion in 2009 reflects the sharp decline in house prices and housing transactions.

Figure 7: Components of Change in Housing Debt

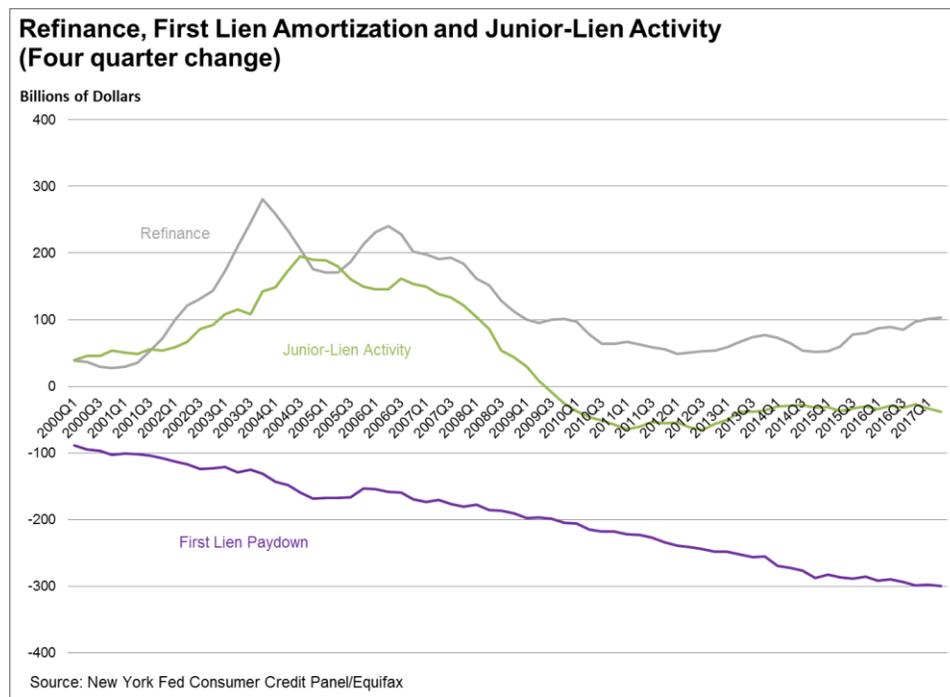


Finally, the green line here shows the contribution of the remaining factors that affect housing-related debt balances. These factors are further broken out in Figure 8, but before turning to that it is worth examining their aggregate effect in Figure 7. Between 2003 and 2006, the combination of first lien amortization (the paydown of balances as people make their mortgage payments), cash-out refinances, and changes in balances on junior liens were adding around \$200 billion a year to aggregate housing

<sup>9</sup> In the case of new construction, the buyer's mortgage replaces whatever kind of financing builders had used; typically we will not observe builders' debts in the CCP and the buyer's entire mortgage will be a net increase in the outstanding mortgage balance.

debt balances. Thus, after making their required monthly mortgage payments, households drew down the value of their housing equity by as much as \$290 billion annually in 2003 (\$880 billion in total for years 2003-2006) to fund their consumption plans. As shown in Figure 8, this borrowing was accomplished through two channels: cash-out refinance, shown in the gray line, and through junior liens both by opening Closed End Second (CES) mortgages, and opening and drawing against Home Equity Lines of Credit (HELOCs).

Figure 8: Cash-out Refi, Junior Lien Borrowing, and 1<sup>st</sup> lien Amortization



It is well known that the growth of housing debt and house values went hand-in-hand during the boom years of the 2000s, as the use of the “House as ATM” became widespread. Figure 7 and Figure 8 provide precise information on how significant this phenomenon became, and how it was accomplished, while Figure 4 complements this information by showing that a similar dynamic was in place outside of housing debt. Net new borrowing in consumer (\$200 billion annual rate from 2003-2006) and housing-

related (\$200 billion) added roughly \$400 billion (annual rate) to households' funds available for consumption.

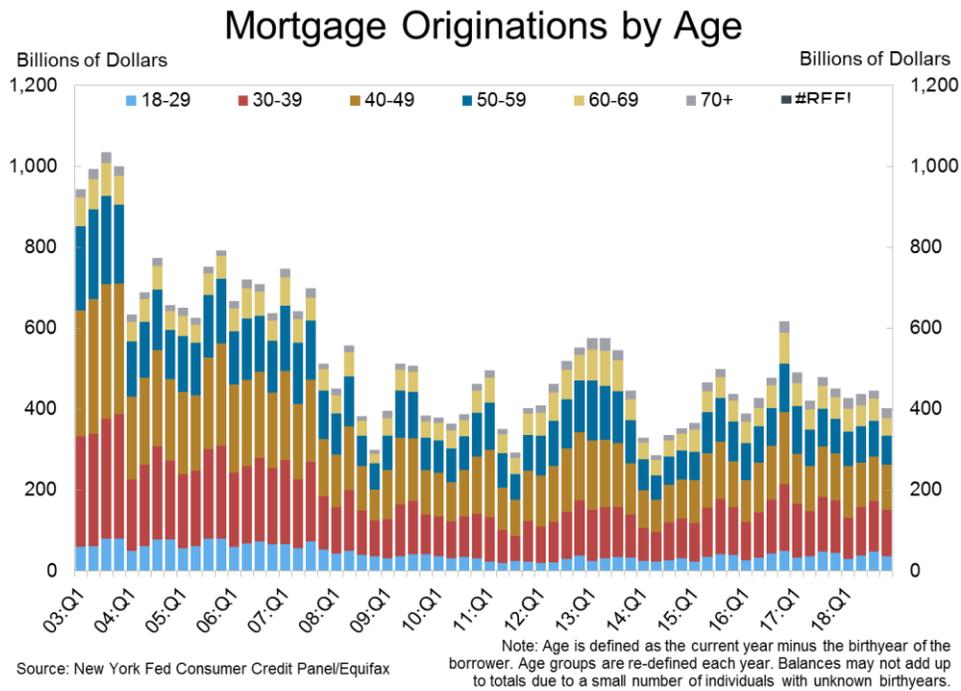
This pace of household borrowing to fund consumption other than housing began to slow sharply after 2006 and reversed by 2008. By 2009, households were *paying down* \$100 billion of debt at an annual rate, a complete turnaround in their borrowing and saving behavior by nearly half a trillion dollars compared to 2006, and one which coincided with a major and decline in personal consumption expenditures, which peaked in June 2008 and recovered to that previous nominal peak only in March 2010.

## Trends in Borrower Characteristics

We have seen that the rapid increase in debt shown in Figure 3 was partially due to increases in the value of homes and the debt required to purchase them, and partially due to increases in the appetite for debt-financed consumption. Who were the borrowers behind this surge?

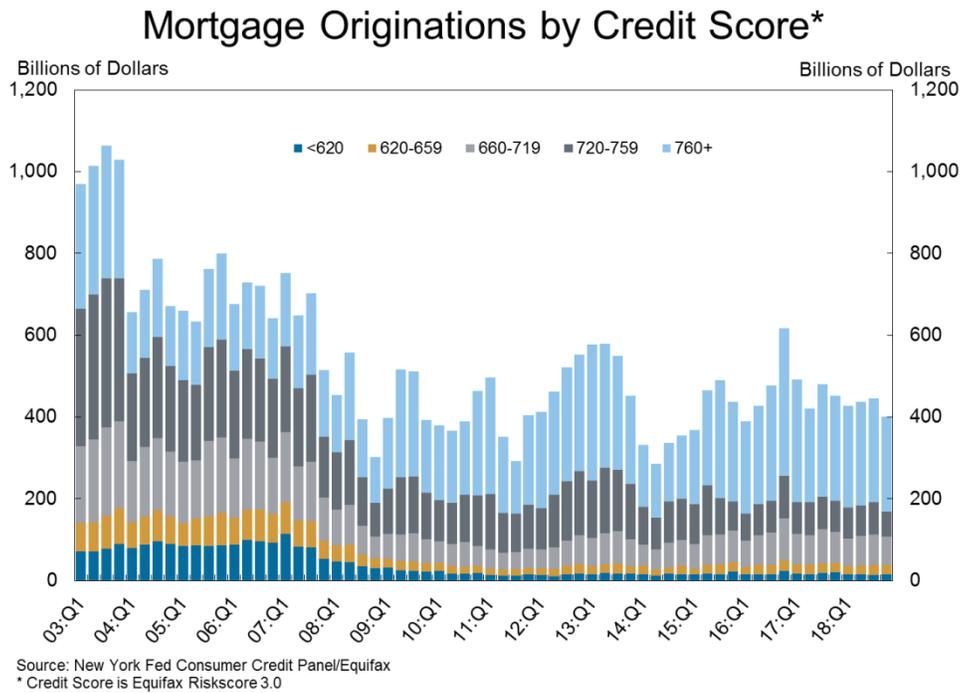
Figure 9 and Figure 10 show part of the answer to this question for mortgage borrowing (trends in new HELOC borrowing will be discussed separately below). Here, each bar shows the total of new mortgage originations (the gross flow of new borrowing) by age, in Figure 9, and by credit score group, in Figure 10. The first thing to note in these two figures is the very sharp decline in mortgage originations after 2007. But there are also shifts in borrower types.

Figure 9



The age distribution of mortgage originations shows a pronounced cyclical pattern. The effects of the financial crisis and the subsequent tightening of mortgage lending standards are apparent in the age distribution of borrowers. After capturing an average 38% of mortgage originations from 2003-2008, borrowers under 40 saw their share drop to 28% for 2012 and 2013. The share of mortgage lending to this group of borrowers, however, rebounded at the end of the period.

Figure 10



There is a strong upward trend in credit scores over a typical individual’s lifetime, leading to a strong superficial similarity between Figure 9 and Figure 10. More important for the current discussion is the composition of those mortgages that were originated before and after the financial crisis and Great Recession. During 2003-06, there is clear evidence of substantial mortgage lending to borrowers with low credit scores – subprime borrowers with scores below 620 in dark blue and near-prime borrowers with scores between 620 and 659 in yellow. Lending to that group rose from 15% of total originations in 2003 to 24% by 2006; the origination share of borrowers with credit scores below 620 rose from 8% to 14% over the same period.

Beginning in early 2007, as stresses began to appear in the nation’s mortgage finance system, we observe declines in this form of lending: mortgage originations to borrowers with credit scores below 660 fell from \$664 billion in 2006 to \$151 billion in 2010, a 77% reduction. The subprime share of total originations over this period follows a similar pattern, declining from 24% in 2006 to under 10% by 2010. In the data through 2018 there is no evidence of a revival in subprime mortgage lending to

anything like the 2003-06 shares or levels. In 2018, mortgage originations to borrowers with credit scores below 660 were \$150 billion, almost identical in nominal terms to their level of eight years earlier, and less than 9% of the total mortgage originations in that year. In contrast, the share of mortgage originations going to super-prime borrowers climbed from as low as 23.5% in 2006 to 49.6% in 2010 and 57.8% in 2018.

These changes in the level and share of young and, particularly, subprime borrowers over time have been the subject of a recent debate in the research literature. Mian and Sufi (2009), and Keys et al. (2010), among other authors, have emphasized the role that subprime mortgages, particularly those which were securitized, played in the foreclosure crisis of the late 2000s. More recently, Adelino et al. (2016) and others have argued that the “middle class” or higher credit score borrowers played a hitherto underappreciated role in the crisis. Figure 10 provides limited evidence for both of these hypotheses: lending to subprime borrowers surely was relatively important in the lead-up to the crisis, but higher credit score individuals were always the most important players in mortgage borrowing, and they would ultimately go on to contribute a large share of mortgage defaults when prices began to fall (Adelino et al, 2016). Nonetheless, the boom in subprime lending that took place prior to 2008 is clear in the data, and the outstanding portfolio of mortgage debt at the peak of the housing market included a larger share of subprime borrowers, many of whom subsequently went on to default (Fuster et al. 2018).

One additional observation provides further insight into the “Prime vs Subprime” debate in the origins of the foreclosure crisis. Haughwout et al. (2014) use credit bureau data to argue that for the individuals who originated mortgages during the crucial 2003-2006 period, credit score became less predictive of loan quality during the subsequent period of house price declines. This happened, the authors argue, because of an increasing share of speculative investors, who controlled multiple properties in which they did not live, while nonetheless reporting themselves to be owner-occupants in

the loan-level data. These investors had high credit scores, but nonetheless had low default costs and were very price-sensitive; they therefore were quick to become delinquent and default when prices began to decline after 2006. This evidence suggests that credit score alone is an insufficient basis in which to judge the riskiness of a loan portfolio, and demonstrates the value of the comprehensive view (including the number of outstanding first mortgages) allowed by credit bureau data such as the CCP.

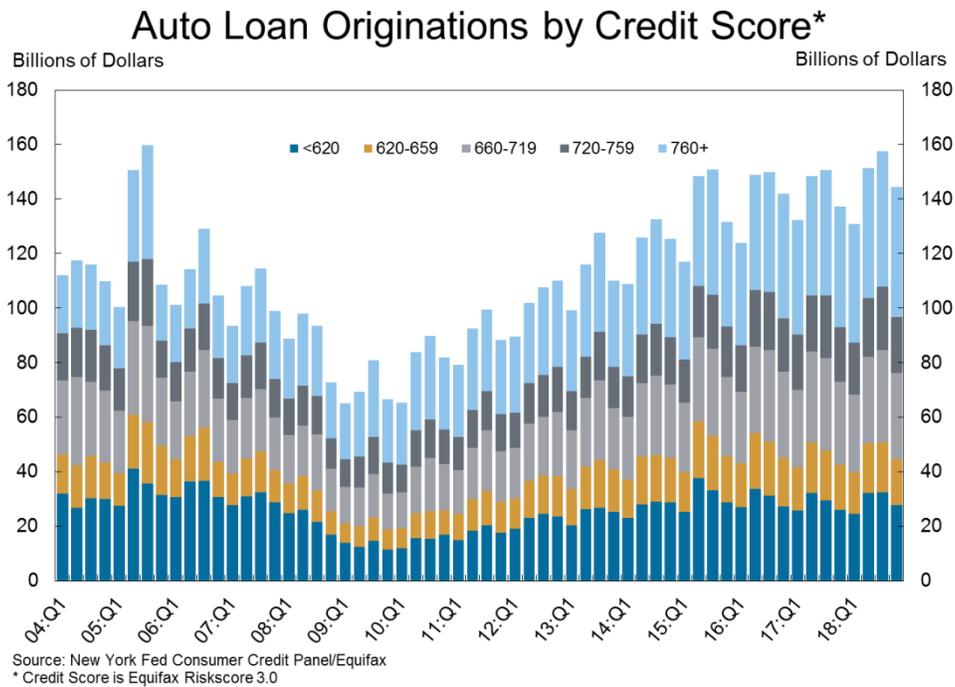
These changes in mortgage standards are reflected in homeownership rates. The homeownership rate – the proportion of households that own the unit in which they reside – had for 30 years moved in a fairly narrow band between 63% and 65%. Beginning in the late 1990s, homeownership began a steady rise that culminated in a peak of 69.3% in June 2004. This early peak in homeownership is consistent with a view that late in the boom investors were responsible for much of the activity observed in the market: many transactions and increasing prices, but little movement in the rate at which people transitioned into owning their own homes. After 2006, homeownership fell sharply and persistently until 2016, at which point it had reached 63.0%. It began a rebound at that point but remains in its pre-boom historical range.

Unlike mortgage borrowing, the auto loan market did not see a large increase in subprime lending volume over the 2003-2006 period: subprime originations increased slightly from \$30 billion in 2004 to \$33 billion in 2005 and 2006, but declined slightly the next year. There was, however, a notable tightening in auto lending as the financial crisis unfolded and through the worst of the Great Recession. Lending to those with credit scores below 660 fell from 44.0% in 2006 to 29.6% in 2009 while subprime lending declined from 30.0% to 18.7% over the same period.

However, unlike the case of mortgage lending, subprime auto lending quickly reappeared, and by 2015 total auto lending, and the component going to low credit score individuals, was approaching its pre-crisis highs in nominal terms. Auto lending in total has continued to grow, reaching a new high in

2018 of \$584 billion in new originations. As a share of total originations subprime lending remains somewhat below pre-crisis levels. After reaching 18.7% in 2009 it increased to 22.1% in 2012 and has moved within a fairly narrow band of between 20.0% and 22.8% since then. The share of originations going to super-prime borrowers instead rose from 20.7% in 2006 to 33.9% in 2009 and has subsequently varied between 29.0% and its 2018 reading of 32.3%. Thus the credit quality of the stock of outstanding auto debt has improved since before the recession, even as the number of Americans with an auto loan and the amount of auto debt has reached new highs.

Figure 11



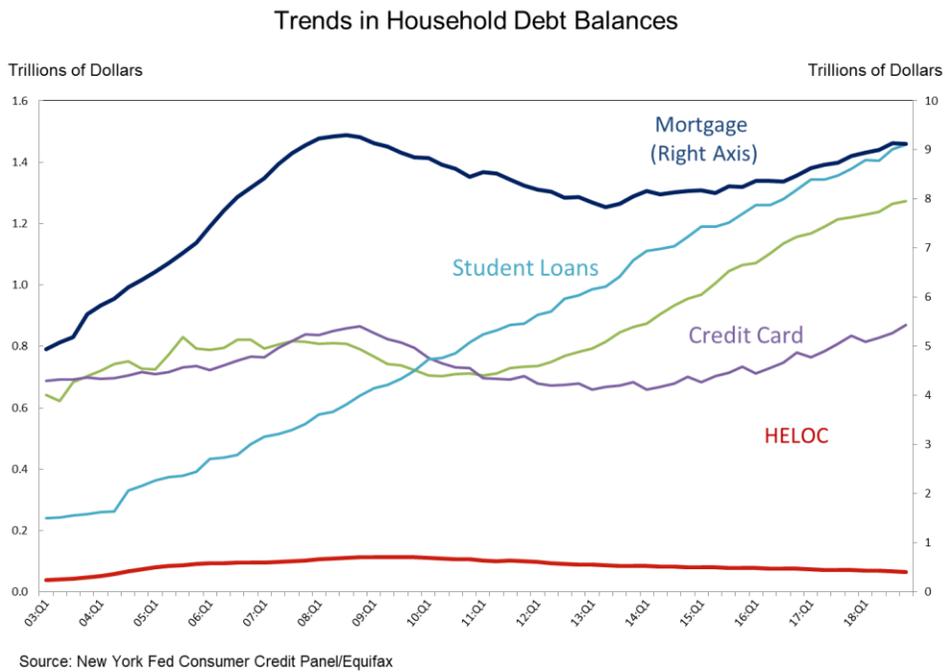
*Insert Charts 6 & 7 (Origination for Autos and Mortgages) juxtaposed next to each other*

## Trends in other debt

Figure 12 summarizes the trends in all forms of household debt over the period we are examining. Here the contrast between the mortgage and auto loan dynamics described above is very apparent – at the

end of 2018, mortgage balances had yet to re-attain their previous nominal peak of more than a decade earlier, while nominal auto balances were more than 50% above the pre-crisis peak. Credit cards show an intermediate pattern, with a prolonged decline in balances through 2014, followed by a slow recovery that ultimately allowed credit card debt outstanding to reach an all-time high by the close of 2018.

Figure 12



As in mortgage lending, the trends in credit card balances were driven by a sharp reduction in credit availability to low credit score borrowers following the financial crisis. The return of growth in credit card balances that began in 2014 was led by higher credit score borrowers. While low-score borrowers saw some increases in their access to cards themselves, the credit limits on these cards tend to be lower, meaning that credit to sub- and near-prime borrowers has remained relatively tight throughout the recovery.<sup>10</sup>

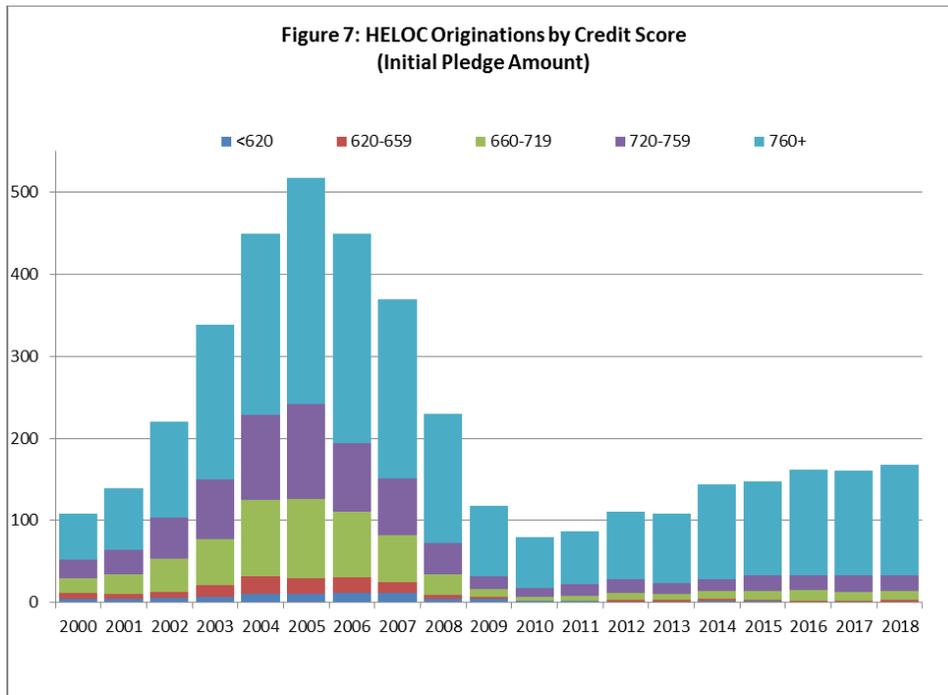
Consequently, like mortgage and auto debt, credit card debt has improved in quality, at least with regard to credit scores, since the Great Recession. However, while total outstanding credit card debt held by subprime borrowers remains below pre-crisis levels, it has risen by over 40% since 2014, representing nontrivial risk exposure.

Home Equity Lines of Credit (HELOCs) reflect the extreme underwriting cycle in housing-secured credit that occurred during our period. Through mid-2006, HELOC balances (and limits, not shown here) rose more rapidly than mortgage balances in relative terms. After a period of slowing around the house price peak, HELOCs continued to grow until 2009, at which point they began a decline that persisted through 2018. Indeed, HELOC is the only form of household debt that has not resumed growth since the financial crisis and Great Recession. Nominal balances at the end of 2018 are more than 40% below their 2009 peak. Figure 13 clearly demonstrates that this reduction was achieved in part by limiting HELOCs to high credit score borrowers. In fact, HELOC standards currently remain even tighter than those of mortgages: the median HELOC borrower's credit score has been at least 790 since 2008, compared to median credit score around 760 in recent years for mortgage borrowers.

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<sup>10</sup> See <https://libertystreeteconomics.newyorkfed.org/2017/08/just-released-more-credit-cards-higher-limits-and-an-uptick-in-delinquency.html>.

Figure 13



## The Curious Case of Student Loans

In Figure 12, perhaps the most remarkable series is that for student loans, shown in light blue. Unlike all the other forms of household debt, student debt was completely impervious to the credit cycle, a fact which was also apparent in Figure 4. This steady growth in student borrowing reflected many factors; (i) increases in the number of post-secondary students borrowing, (ii) increases in borrowing per student who borrows, and (iii) slow repayment of existing debt.

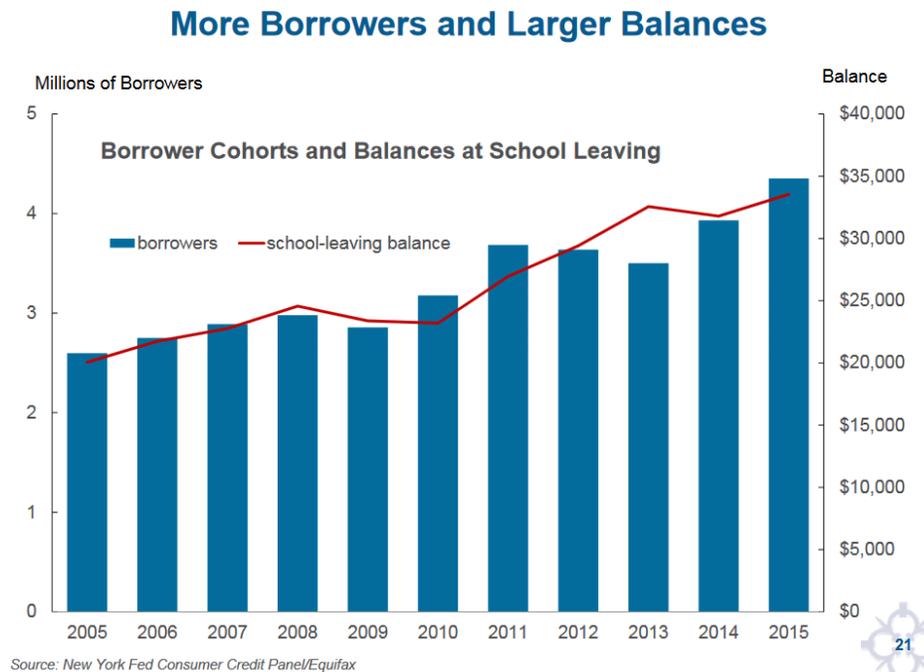
The first two of these factors increase student debt originations, while the last affects how long debts remain on individuals' credit reports.

In 2010, the US Department of Education (DoE) became the principal source of supply under the Federal Direct Loan Program of funds for student loans, and over 90% of outstanding student debt is currently owed to the federal government. This debt is not underwritten in the traditional sense of evaluating individual borrowers' ability to repay the debt; rather the DoE regulates which institutions'

students will be eligible to borrow, and caps amounts that can be borrowed by each individual undergraduate. (The limits are higher for graduate students.) Parents are also able to borrow to finance their children’s education under the Parents Plus program.

Figure 14 shows how the number of new borrowers and the average loan amount have risen over time. Comparing the 2005 and 2015 school-leaving cohorts, we see that the number of borrowers rose from about 2.5 million to over 4 million in this decade, as average amounts borrowed per borrower rose from just over \$20,000 to almost \$35,000.<sup>11</sup> Note the spike in borrowers in the cohort leaving school in 2011, likely a reflection of the poor labor market, and thus enhanced incentives to attend post-secondary education, during the Great Recession.

Figure 14: Borrower Cohorts and Balances at School Leaving

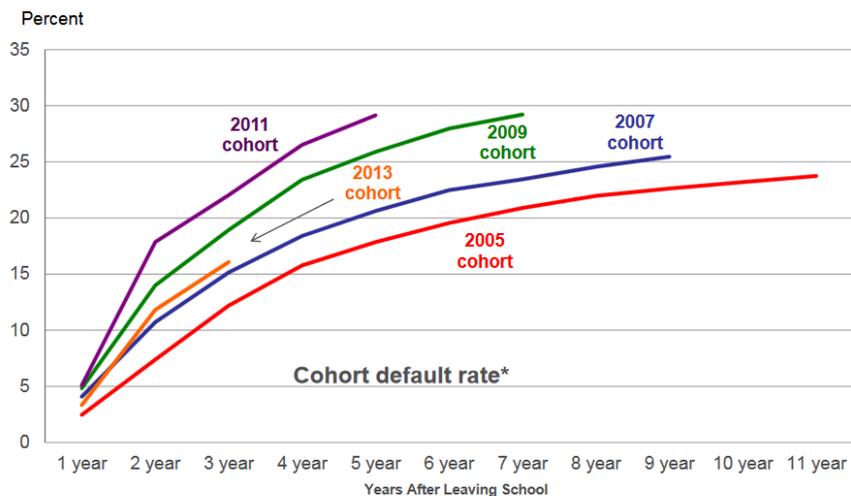


<sup>11</sup> We use the last year any student borrowing took place as a proxy for the completion of schooling and the assignment of borrowers to cohorts. We use the term “graduation” to refer to this date, but our data do not indicate whether a borrower graduated or simply stopped borrowing to fund education.

In addition to being large, the “Great Recession” graduation cohorts have proven to be poor performers in student debt repayment. Figure 15 shows default rates by year since graduation for selected cohorts since 2005 (default is defined here as more than 270 days delinquent). Two facts are clear from the figure: borrowers continue to default for many years after they leave school (the 6-year default rate is higher than the 5-year, etc.) and default rates worsened significantly for cohorts who completed their education during and just after the Great Recession (the 2007, 2009 and 2011 cohorts). For example, nearly 30% of the 2011 cohort defaulted in the first three years following graduation. This last fact is consistent with these groups graduating into an especially weak labor market. It is also likely, although more difficult to observe, that these cohorts were more adversely selected ex ante: that their decision to attend post-secondary education was influenced by dim labor market prospects in the short run rather than a strong incentive to invest in their human capital in the long run.

Figure 15

### Highest Default Rate from 2011 Cohort; 2013 Cohort Shows Improvement



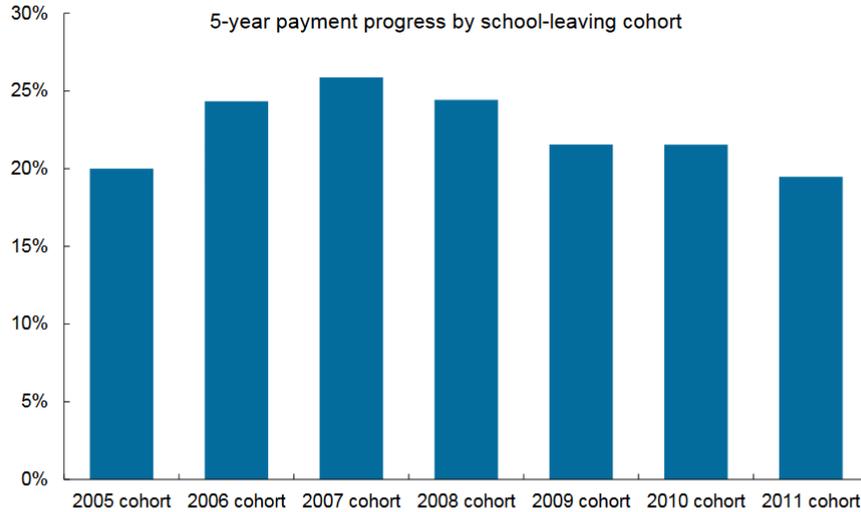
\* Borrowers are assigned to cohorts based on the last academic year of borrowing.  
Source: New York Fed Consumer Credit Panel/Equifax



The high default rates on student loans might be expected to contribute to reductions in loan balances, as we saw for mortgage foreclosures in Figure 7. Student loans, however, are not generally dischargeable even in bankruptcy, meaning that even defaulted balances do not disappear from borrowers' credit reports. When combined with the various options borrowers have to delay their loan repayments (such as grace periods, deferments and programs like Income-Based Repayment), this unique feature of student debt helps to explain why balances exhibit such a strong growth pattern over time. Figure 16 provides an example of this phenomenon, as we show the share of student debt that is paid down over the first five years after graduation by graduation year. For the 2011 cohort, which featured high default rates and which had new programs such as income-based repayment available for much of the first five years after school completion, only 20% of the balance had been paid down over that period. Since these loans are typically scheduled to be completely repaid in 10 years, on-schedule repayment would imply that about 38% of balances would be repaid after five years. The actual rate of student loan repayment is quite low.

Figure 16

## Lower Repayment Rates for Recent Cohorts 5 Years After Leaving School



Source: New York Fed Consumer Credit Panel/Equifax



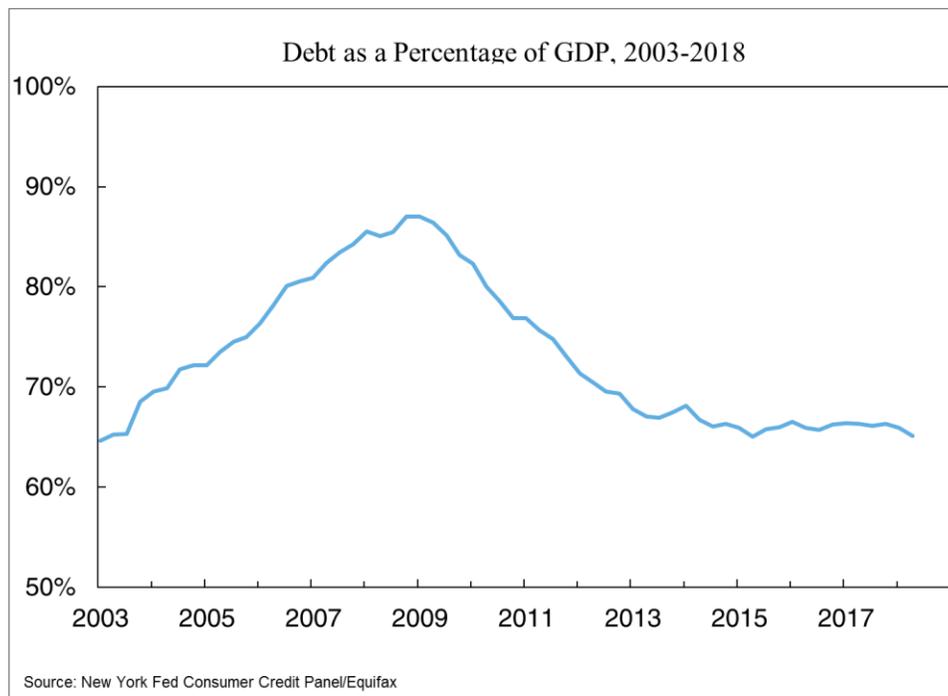
A final observation on student debt is that the effects of these long-lasting balances and high delinquency rates are felt in other sectors of the economy. One area that has received a lot of attention is the relationship between borrowing for education and homeownership. It seems quite clear at this point that, in spite of the fact that the presence of student debt on a borrowers' credit report indicates that they have attended at least some amount of post-secondary education, student debt represents a drag on household formation and homeownership. This may be especially true of the loans delinquent or in default, which is of course the case for many student borrowers, but the very presence of student debt seems to inhibit homeownership (Bleemer et al., 2017).

<https://www.newyorkfed.org/medialibrary/media/press/pressbriefing-household-student-debt-april32017.pdf>, pp 36-47). The fact that homeownership, which is relatively easy to measure alongside student debt, is affected is suggestive that student loans also have impact on other kinds of household

behavior that are more difficult to measure. This is an area where research is likely to remain quite active.

## Perspectives on Current Household Debt

Figure 17



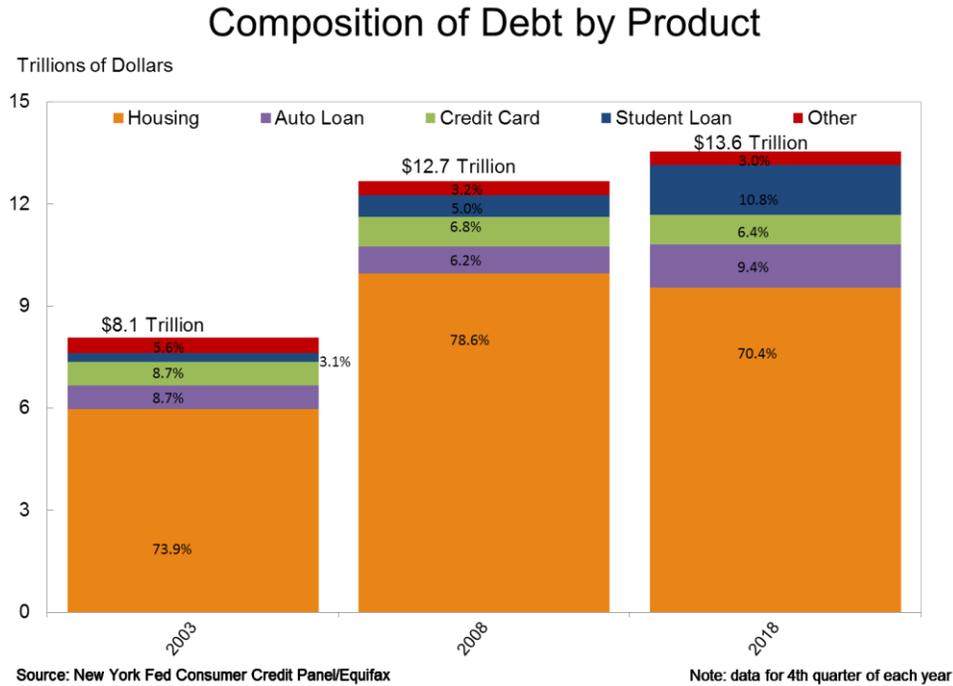
In 2017Q1, total debt surpassed the previous nominal peak of \$12.675 trillion by increasing to \$12.725 trillion. Debt has continued its slow but steady increase since then. In the most recent quarter for which we have data at the time of writing, the fourth quarter of 2018, total household debt stood at \$13.54 trillion. While nominal debt has now grown well beyond its previous peak, its composition and implications are now very different from those at the last peak in household borrowing. First, recall that while nominal debt is important because household debt contracts are typically written in nominal terms, the impact of debt on the economy is perhaps better described by its share of overall activity. By that measure, debt relative to GDP is still well below its previous peak; see Figure 17. And unlike in the

years preceding the Great Recession, debt growth during the recovery appears to be much more sustainable, keeping this ratio stable or even falling slightly since 2014.

### Change in Debt Composition

Second, while total debt has re-attained its previous peak, as mentioned earlier its composition has changed dramatically. While housing-secured obligations drove most household debt growth in the years preceding the recession, other components are more significant in determining the amount of debt now. From 2005 to 2010, mortgage and HELOCS made up, on average, 78% of total household debt. Now, after a decade or more of very tight underwriting on debt secured by housing, these two types of debt only account for 71% of the total. Even though the level of mortgage debt has risen, it remains below its 2008 level and its relative share has declined steadily since 2011 as other forms of debt have risen much more rapidly; see Figure 18: Composition of Debt by Product. Most notably, student loans now make up 10.7% and auto loans 9.3% of household debt following a prolonged period of strong growth in both categories. That is much higher than in years past, and show little signs of abating, particularly the level of student loan debt, which has never fallen.

Figure 18: Composition of Debt by Product



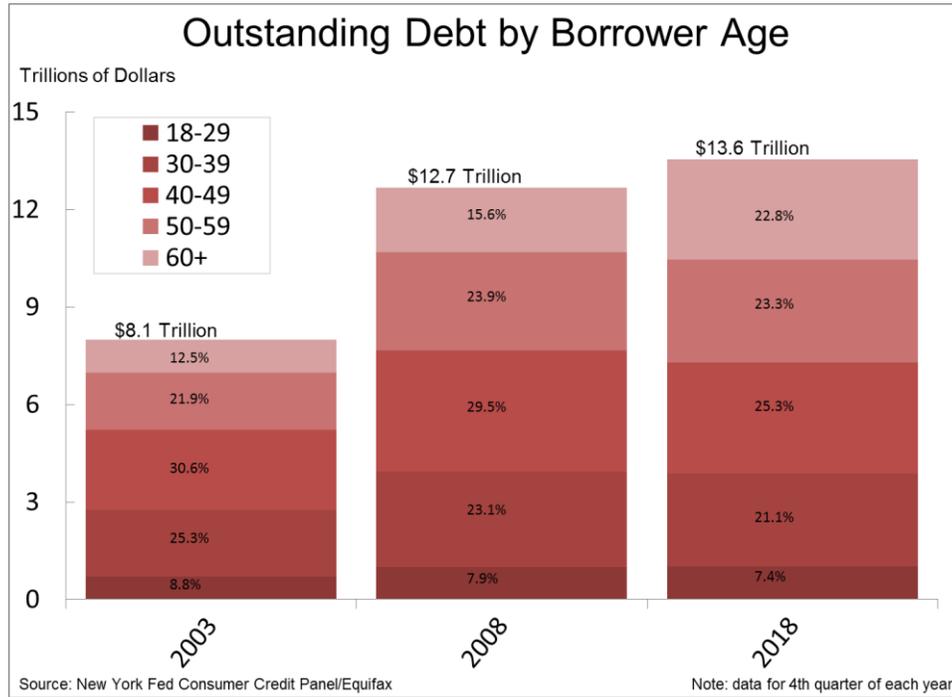
## Implications of the Change in Debt Composition

A decade of tight underwriting, particularly on housing debt, has restrained the overall growth of debt, and changed the composition of debt. It has also influenced the distribution of debt over household types. In contrast to the period leading up to the financial crisis and Great Recession, when subprime lending allowed debt growth to spread throughout the population, trends since 2008 have focused debt growth among older, higher credit score, and presumably wealthier, households.

Figure 19: Age Distribution of Outstanding Household Debt shows one manifestation of this phenomenon: the significant shift of debt toward older borrowers as debt re-attained its previous (2008) peak in 2016. In 2003, on the eve of the explosion in mortgage lending, just over 35% household debt was owed by people over 50 years old. By 2008, a combination of an aging population and increases in mortgage lending to older borrowers pushed this share to almost 40%. By 2016, older Americans' share had continued to rise to nearly 47%, in spite of slow growth in mortgage debt. A primary reason for this increase is tight underwriting – the same phenomenon that produced the credit

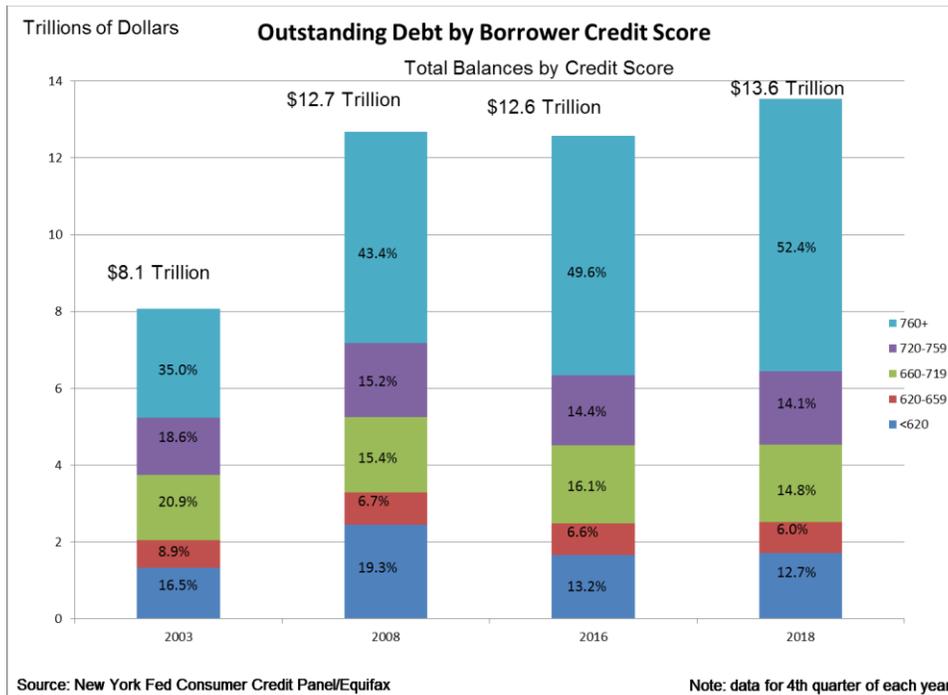
score dynamics shown in Figure 14. Indeed, since 2008 the rate of debt growth in all major products has been strongest for borrowers over 60.

Figure 19: Age Distribution of Outstanding Household Debt



Finally, the changes in underwriting of newly originated loans discussed earlier, and the increase in the share of debt owed by older borrowers who generally have more stable incomes and higher wealth, have contributed to an overall improvement in the quality of outstanding debt as measured by the fractions of debt owed by borrowers with different credit scores.

Figure 20: Outstanding Debt by Borrower Credit Score



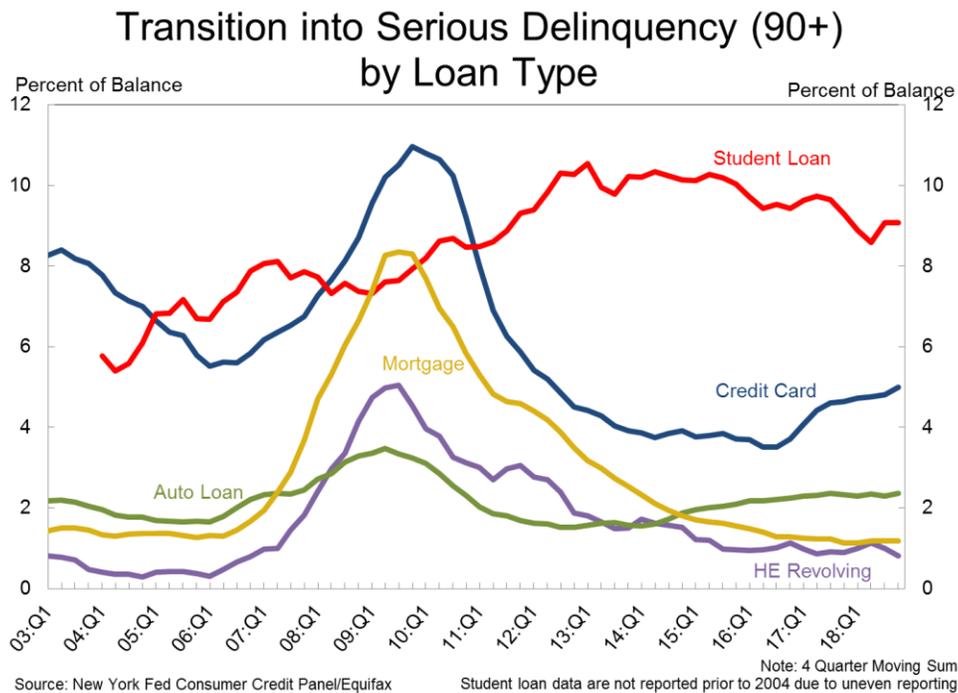
As discussed in the previous section lending standards, at least as measured by credit scores of new borrowers, have loosened for some products since the recession—though for the crucial category of housing-secured debt they are still much stricter than they were before 2008. In line with the trends immediately following the recession, a much larger share of the household debt has been accruing to older, super-prime borrowers, those with credit score above 760. Thus in addition to remaining stable relative to GDP, household debt overall appears safer in being owed by lower-risk borrowers. The improved quality is reflected in generally improved delinquency rates, with some notable exceptions as we will discuss next.

## Delinquencies

During the lending boom from 2003-2006, and despite the high growth in subprime loans, delinquency rates for both mortgages and HELOCs were extremely low, as shown in Figure 21. The figure reports serious delinquency transitions, defined as the share of balances less than 90 days delinquent in quarter t-1 that became 90 or more days delinquent in quarter t, annualized. Beginning in the second half of

2006, delinquency rates began a persistent rise in not only the housing-secured debt, but also in credit cards, auto loans and student debt. The increases in newly delinquent debt continued into 2009 for most of these products, exceeding an 8% annual rate in mid-2009. In that year nearly \$200 billion in mortgage debt, and over \$250 billion in total household debt became seriously delinquent. The increase in delinquency transition rates led to a sharp rise in the stock of delinquent debt. In fact, in the first quarter of 2010, the balance share of mortgages 90+ days past due (8.9%) was about double its 2006 level.

Figure 21



As suggested by Figure 7, these increases in serious delinquency were accompanied by historically unprecedented levels of mortgage foreclosure, as shown in Figure 22. During 2009 alone more than 2 million borrowers experienced a new foreclosure. Between 2006 and 2012, when

foreclosures began to return to more normal levels, that number totaled nearly 10 million. Bankruptcies, which had surged strongly just prior to the 2005 bankruptcy reform, followed a similar pattern.<sup>12</sup>

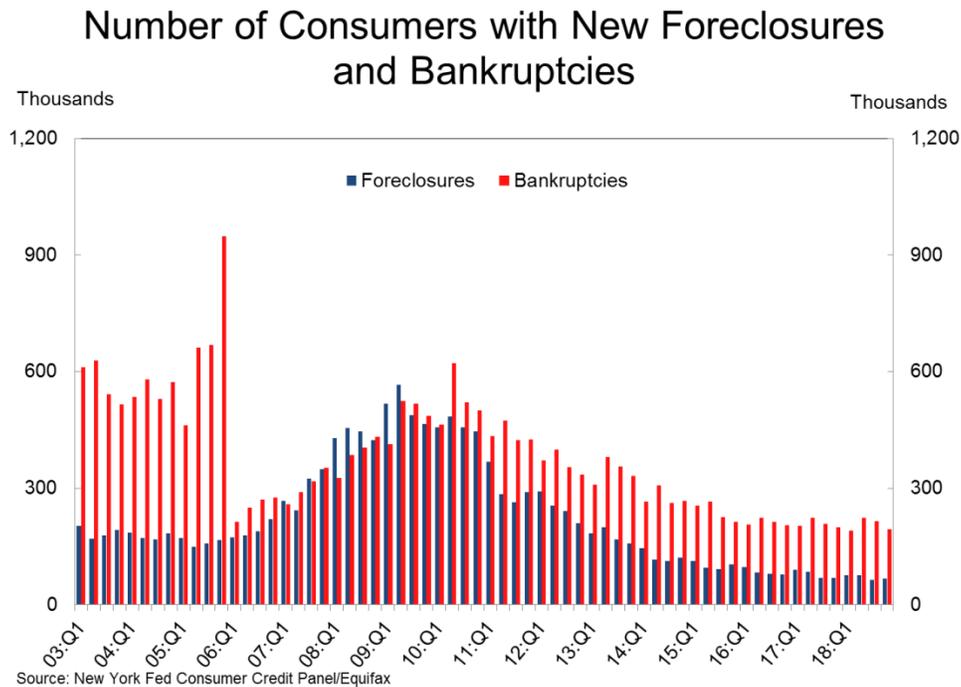
As the effects of the recession began to ease, delinquency transitions, foreclosures and bankruptcies all slowly returned to their pre-crisis levels, although the transition rates for mortgage and HELOC took considerably longer to decline than they had taken to rise, mirroring the housing market distress that continued long after the end of the Great Recession. With the exception of student debt, where delinquency transitions remain very high, all forms of household debt saw their delinquency transition rates decline to levels approximately equal to where they had been prior to the recession; for auto loans, and especially credit cards, delinquency transitions fell to their lowest levels in the history of the data.

With the decline in mortgage delinquency transition rates the share of mortgage balances 90+ days delinquent has steadily dropped and recently reached its early 2000s level of around 1%. Similarly, by 2014 foreclosures had fallen to their lowest levels observed in our data; the 2014 level of new foreclosures had fallen 75% from its level in 2009, when over 2 million consumers experienced a new foreclosure. It is however, more difficult to gauge a “normal” level of bankruptcies, given BAPCPA, the fundamental policy change that took place in 2005. Bankruptcies fell very substantially: by 2015 they were less than a million new bankruptcies, compared with 2 million in both 2009 and 2010.

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<sup>12</sup> In 2005, Congress enacted the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA), which reduced the benefit of filing for Chapter 7 bankruptcy. See Mitman (2016) and Morgan et al. (2012) for discussion of the effects of the reform on subsequent bankruptcy and foreclosure filings.

Figure 22



Similarly, most other types of loans dropped to their pre-recession levels of delinquency. The percentage of credit cards transitioning into delinquency actually dropped significantly below its pre-recession level. Although credit card transitions have increased slightly in the recent quarters to above 6%, they still remain well below its pre-recession level, see Figure 21.

Delinquency transition rates for auto loans saw comparable improvements following the recession, with 2011 rates reaching 1.5%, below pre-crisis levels. Since then, however, auto loan delinquency transitions have increased to 2.4%. Additional analysis revealed that the sharpest worsening in performance was for loans held by borrowers under 30 years old, with rates exceeding 4%, and was largely concentrated among lower-credit score borrowers.<sup>13</sup>

<sup>13</sup> See Haughwout, A., D. Lee, J. Scally and W. van der Klaauw, 2019. "[Just Released: Auto Loans in High Gear](#)," *Liberty Street Economics* February.

In contrast to other loan types, student loans as usual tell a very different story. Delinquency transition rates continue to increase immediately following the recession. Although transition rates in the past three years have declined slightly, perhaps reflecting new options for delaying repayment like income-based repayment plans, they still remain well above their pre-recession levels. Interestingly, student loan delinquency transition rates peaked around 2012, about 3 years later than other types of loans, perhaps due in part to the large number of people responding to the economic turmoil by returning to school. Instead, they began climbing just as other delinquency rates were falling in 2009-10.

## Conclusion

There are three dynamics of household debt since the Great Recession that we wish to highlight before closing. First, the favorable shift in the credit score composition of the outstanding stock of mortgage debt has reduced the vulnerability of the household sector to an income shock. Tight mortgage underwriting has made it difficult for households to use debt to tap home equity, and this has produced a cushion of housing wealth that may be available to help households through a period of reduced income growth, were one to materialize ([Fuster, et al. 2017](#)).

Second, this same tight underwriting has allowed mortgage delinquency rates and transitions to fall to very low levels, and has made the outstanding stock of mortgage debt considerably safer than in any time since before the Great Recession. Nonetheless, given the importance of housing equity in default decisions (Gerardi et al. 2008, Haughwout et al, 2008) the household sector is potentially vulnerable to large price declines.

Finally, it is a little-considered feature of debt that it can provide access to assets. Since tight mortgage underwriting has focused access to homeownership to only those with higher credit scores, most of the increase in home equity, particularly equity that is tappable, has accrued to high-score and/or older borrowers. In 2006, 44% of tappable equity came from homeownerships with credit scores of 780; in 2017, the share had increased to 53%. The increase in tappable equity for older homeowners

is even more striking—in 2006, only a fourth of total tappable equity was held by homeowners over 60, but in 2017, their share had increased to 41%. Much of the corresponding decline in share came from homeowners under 45, whose share of equity declined from 24% in 2006 to 14% in 2017.

This shift raises new questions about the relative wealth position and prospects of younger individuals. Burdened by increasing amounts of student debt, reduced homeownership and home equity, and relatively high or increasing student and auto loan delinquency rates, their financial situation contrasts sharply with the overall generally improved dynamics in household debt. We see some reflections of this change in low levels of mortgage originations and relatively high auto and credit card delinquency rates for millennials compared to the young of the early 2000s. Given the growing importance of this group in the economy, these dynamics are well worth monitoring closely.

The New York Fed's Consumer Credit Panel has provided a wealth of new insights into the world of household finance, and its unique panel design provides one solution to the challenge of creating a manageable and representative sample from a dataset collected for administrative credit monitoring purposes. The availability of new administrative datasets, such as the CCP, for economic research presents new opportunities for researchers to gain a deeper understanding of the heterogeneity that is obscured by aggregated macroeconomic statistics.