

# What Drives Consumer Debt Dynamics?

*By Edward S. Knotek II and John Carter Braxton*

Monetary policy influences household spending through various channels. For example, low interest rates support higher asset prices, increasing households' wealth and producing more spending through the wealth effect. In addition, to the extent that previously acquired debts have floating interest rates or can be refinanced, low interest rates can reduce the burden of servicing those debts and free up cash flow for other spending. Low interest rates also tend to make new borrowing more attractive, which in turn can boost household spending.

In the wake of the housing bubble, consumers generally have been reducing rather than increasing their debt levels despite low interest rates. Many policymakers and economists have pointed to this deleveraging process as an important drag in the subdued recovery from the financial crisis and recession. Deleveraging has entailed a combination of defaults by households, paying down of old debts, and weak borrowing to take on new debts.

This article tracks the evolution of consumer debt by differentiating between the number of consumers taking on more debt and the

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dollar amount by which individual consumers are changing their debt levels. It shows that much deleveraging has occurred through a steep decline in the number of consumers taking on more debt. With relatively few borrowers taking advantage of historically low interest rates to take on more debt and expand spending, accommodative monetary policy is less effective than in normal times.

While the number of consumers increasing their debt remains at low levels, it has recently begun to move higher. Consumers from lower-income areas and consumers with risk scores in the bottom half of the distribution—that is, individuals deemed to be relatively risky by a credit reporting agency—have been key drivers of this modest rebound. In addition, the number of consumers taking on more debt is growing across geographic regions, including areas that experienced strong debt growth during the housing bubble, suggesting that debt overhang is playing only a limited role in consumer debt dynamics in the recovery.

The first section of this article describes the data used to study changes in consumer debt holdings. The second section examines recent changes in consumer debt in the aggregate. The third section shows how the percentage of consumers increasing their debt and the average size of debt changes drive aggregate debt movements. The fourth section shows how these two measures vary across different groups of consumers.

## **I. DATA ON CONSUMER DEBT**

To study the evolution of consumer debt, this study relies on data on individual consumer debt holdings from the Federal Reserve Bank of New York's Consumer Credit Panel (FRBNY-CCP). The FRBNY-CCP is a nationally representative sample of all individual credit records maintained by Equifax, one of the major consumer credit reporting agencies.<sup>1</sup> The dataset begins in the first quarter of 1999 and includes detailed information on the amount of outstanding debt for an individual on a quarterly basis. The panel contains limited personal information, such as the individual's year of birth and state, county, and zip code of residence.<sup>2</sup> However, each quarter the panel provides the individual's Equifax risk score.<sup>3</sup>

This article breaks consumer debt into five categories: first mortgage, home equity, auto, credit card, and other.<sup>4</sup> The analysis excludes student loan borrowing due to difficulties in matching borrowers over time.

The combination of breadth and depth makes the FRBNY-CCP ideal for studying consumer debt dynamics. The representative nature of the FRBNY-CCP allows for computing aggregate debt statistics at the national level. At the individual level, the FRBNY-CCP employs unique identifiers so that individuals can be tracked over time and their borrowing histories reconstructed. Observing these borrowing histories can help determine which factors play an important role in driving the evolution of consumer debt.<sup>5</sup>

## II. CONSUMER DELEVERAGING IN THE AGGREGATE

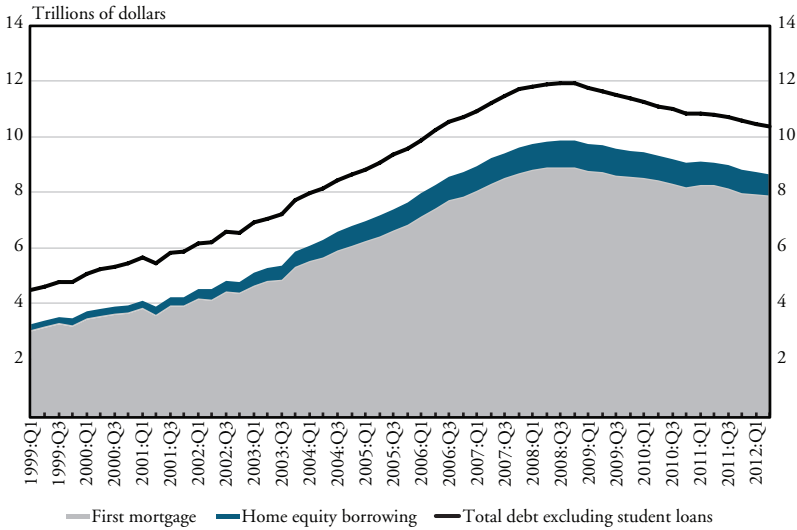
Debt has been understudied in macroeconomics, due to the view that debt is simply a balance sheet entry: it is simultaneously one entity's liability and another entity's asset, which in the aggregate cancel each other. The financial crisis has called into question this view of debt and focused attention on how debt affects the economy.

Growing consumer debt played a central role in fueling the recent U.S. housing bubble, and consumers generally have been reducing their debt in the aggregate since the height of the financial crisis in 2008 (Chart 1). Based on the FRBNY-CCP data, consumer debt excluding student loans peaked near \$12 trillion in the third quarter of 2008. From the third quarter of 2008 through the second quarter of 2012, debt declined in each quarter, with the exception of the first quarter of 2011. The cumulative decrease in total consumer debt excluding student loans during this time was \$1.6 trillion.<sup>6</sup>

Movements in housing debt have been key drivers of total consumer debt. From the start of 1999 to the third quarter of 2008, total debt increased \$7.5 trillion, with 89 percent of the increase accounted for by first mortgage and home equity borrowing. From the third quarter of 2008 to the second quarter of 2012, first mortgage debt decreased \$1.0 trillion and home equity borrowing decreased \$0.2 trillion, accounting for 78 percent of the decline in total debt excluding student loans.

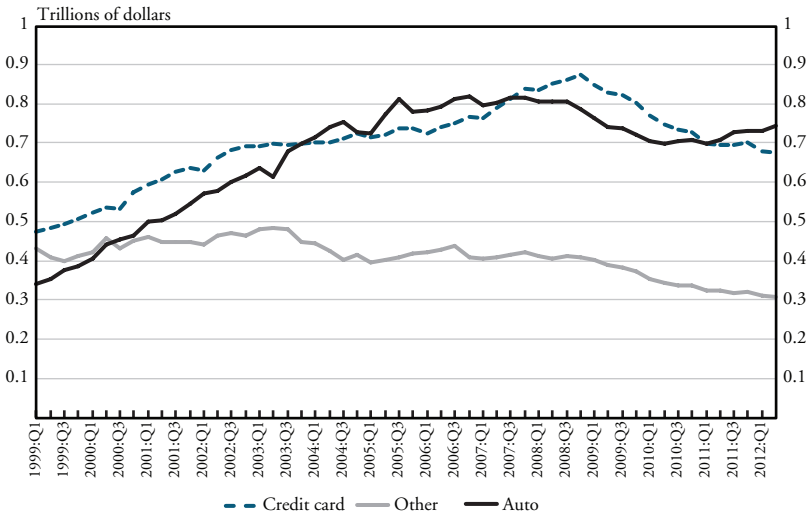
The trends in non-housing categories of debt have varied (Chart 2). Auto debt declined during the recession as light vehicle sales fell sharply, and both auto debt and vehicle sales have moved higher in

Chart 1  
CONSUMER DEBT



Note: Home equity borrowing includes home equity loans and home equity lines of credit.  
Sources: Equifax, FRBNY-CCP, authors' calculations.

Chart 2  
NON-HOUSING COMPONENTS OF CONSUMER DEBT



Notes: Other debt includes consumer finance and retail loans. Student loans are excluded from the analysis.  
Sources: Equifax, FRBNY-CCP, authors' calculations.

the recovery. Credit card debt peaked in the fourth quarter of 2008 and has yet to show signs of rebounding. Other debt—which includes consumer finance and retail loans—peaked in the early 2000s and has trended down since then.

A number of recent studies have sought to quantify the impact of debt on economic activity. Several studies—such as Mian and Sufi (2010), Mian and others, and Dynan—document a connection between leverage growth during the bubble and relatively poor economic performance during the downturn.

Debt and borrowing are also key components of most recoveries. Past recoveries from recessions typically have been led by rising residential investment and purchases of durable consumption goods, transactions that are financed by household borrowing. Accordingly, widespread deleveraging by consumers is cited as one factor impeding this typical cyclical pattern and accounting for the weakness of the recovery following the financial crisis. For example, Mian and Sufi (2011) suggest that high household debt built up in some counties during the boom led to weaker economic conditions in those counties in the early part of the recovery.

In theory, deleveraging by some households need not be problematic for the economy if other, less-leveraged households step up their borrowing (Eggertsson and Krugman; Hall). However, the persistent declines in aggregate household debt imply that this process has not occurred in the current recovery.

One reason less-leveraged households have not stepped up their borrowing is the zero lower bound on interest rates. Under normal conditions, if borrowers grow more cautious and borrow less at a given interest rate, borrowing demand falls and market forces cause interest rates to decline. Monetary policymakers also can intervene to lower interest rates. In both cases, the lower rates act as an offset to the increased caution and stimulate borrowing activity. In current circumstances, however, many short-term interest rates have fallen essentially to zero and cannot go lower. Thus, neither policymakers nor market forces have been able to push rates low enough to offset the shocks buffeting the economy, such as an increase in caution on the part of borrowers that has reduced demand.

Indeed, weak demand for borrowing, especially for new mortgage debt, appears to account for a considerable portion of declines in consumer debt, even though defaults on previously issued mortgage debt remain at elevated levels (Bhutta; Haughwout and others).

### III. DECOMPOSING CONSUMER DEBT DYNAMICS

Examining the borrowing behavior of individual consumers can shed further light on the factors driving deleveraging in the aggregate. To structure the analysis, this article decomposes debt dynamics along two margins.

The first margin is the percentage of consumers who increase their debt over a given time period. This construct separates debt “increasers” from “non-increasers,” where the latter includes both individuals who maintained a constant debt level and those whose debt declined.<sup>7</sup> The percentage of debt increasers can partially capture the extent to which consumers are willing and able to take on additional debt.<sup>8</sup>

The second margin is the average size of debt changes among increasers and non-increasers. The average size measures reflect a variety of influences. Among non-increasers, for example, the average size of debt changes captures regular mortgage principal payments and other debt amortization, payoffs of outstanding balances, and write-downs of debt on which a consumer has defaulted.

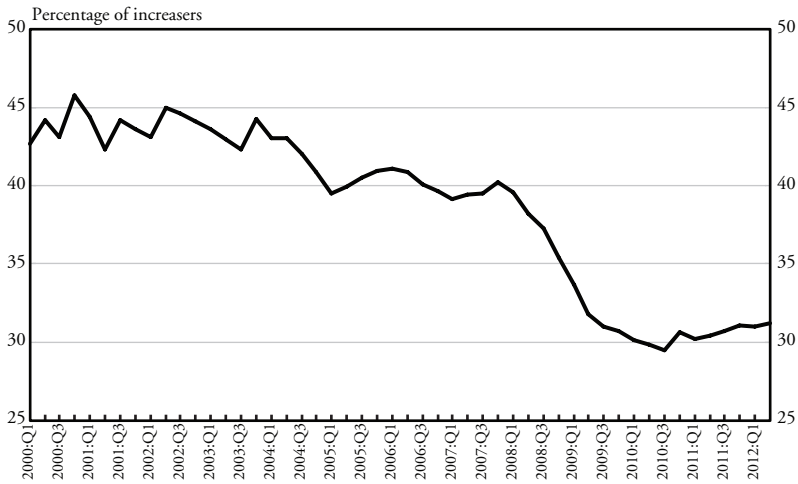
Distinguishing between these two margins of adjustment can help explain movements in aggregate debt. If  $p$  is the percentage of increasers,  $s^+$  is the average size of debt changes among increasers, and  $s^-$  is the average size of debt changes among non-increasers, then aggregate debt dynamics can be described by the relationship:

$$(\text{Average change in debt per person}) = [p \times s^+] + [(1 - p) \times s^-].$$

The percentage of consumers who increased their debt is calculated by identifying those whose debt increased from year-ago levels. Increases are computed over a year because consumer debt records are noisy from one quarter to the next.<sup>9</sup> In particular, some debt records can “disappear” from the database only to reappear later. For example, refinancing can be recorded as a payoff in one quarter and a new balance in a later quarter, or accounts can be transferred or sold and the closing of the old account and opening of a new account may not perfectly coincide.<sup>10</sup>

Chart 3

## THE PERCENTAGE OF CONSUMER DEBT INCREASERS



Note: Percentages are computed by comparing consumer total debt holdings excluding student loans with their year-ago levels.

Sources: Equifax, FRBNY-CCP, authors' calculations.

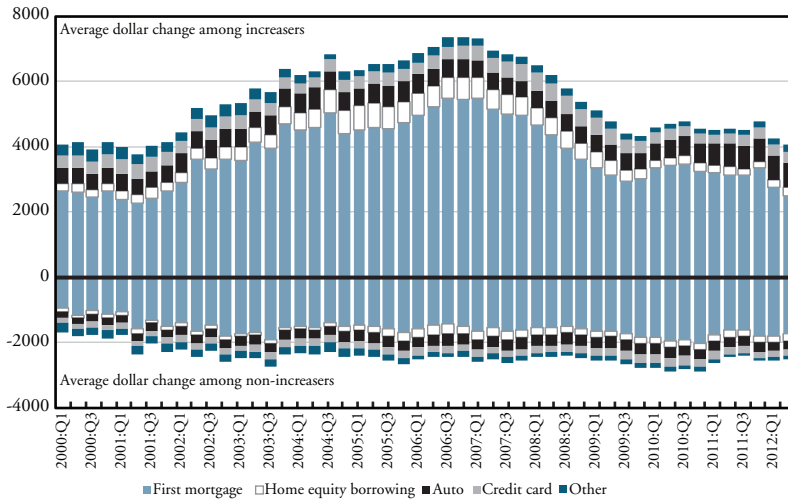
For similar reasons, the average sizes of debt changes are computed as the average, quarterly changes in debt over year-ago levels. Thus, if a consumer's debt in a given quarter were \$1,000 greater than the year-ago level, the quarterly rate of increase would be \$250.<sup>11</sup>

The percentage of consumer debt increasers in the FRBNY-CCP has passed through four distinct phases (Chart 3). It first hovered in the mid-40s from 2000 to 2004. It then fell to about 40 percent during the height of the housing bubble. The next and most dramatic phase was the steep decline that occurred from the fourth quarter of 2007 to the third quarter of 2010, as the percentage of increasers fell more than 10 percentage points, to less than 30 percent.

Finally, the percentage of increasers more recently has shown signs of a modest recovery. In absolute terms, the percentage remains low, indicating that relatively few borrowers are increasing their debt despite historically low interest rates. Nevertheless, the percentage of debt increasers has increased by approximately 2 percentage points from the third quarter of 2010 to the second quarter of 2012. Such increases are consistent with a combination of rising demand for debt and increased supply of credit, despite an ongoing decline in the level of aggregate debt.

Chart 4

## THE SIZE OF CONSUMER DEBT CHANGES



Notes: Amounts reflect the average quarterly change in debt holdings among those consumers who increased (or did not increase) their total debt levels excluding student loans compared with their year-ago levels. All values are current (nominal) dollars.

Sources: Equifax, FRBNY-CCP, authors' calculations.

The housing bust is readily apparent in the sharp decline in the percentage of debt increasers. However, the preceding period, characterized by the housing bubble prior to 2007, did not feature a dramatic rise in the percentage of debt increasers. In fact, the percentage actually drifted lower from the early 2000s through the housing bubble years.

It is the size of debt changes—the second margin—that more clearly helps to explain the housing bubble period, particularly in its later years. The growing housing bubble was associated not with a large percentage of debt increasers across the country, but rather with a growing size of debt changes among the debt increasers (Chart 4, positive readings). The average size of debt increases drifted up steadily starting in 2002 and peaked in the third quarter of 2006.

The housing bust reduced the amount of new mortgage issuance, and lower house prices imply that less debt was required to purchase a given house. As a result, the average size of debt increases has trended lower since 2007, averaging \$4,000 in the second quarter of 2012, almost exactly its level at the start of the sample in the first quarter of 2000.

Despite elevated rates of delinquency and default on consumer debt, the size of debt changes among non-increasers, as of the second



quarter of 2012, was only moderately above its average level from the 2000-2012 period (Chart 4, negative readings).<sup>12</sup> Moreover, adjusting for inflation (because the chart shows nominal changes in debt), the most recent real change in debt among non-increasers was actually *smaller* in absolute terms than the average since 2000.<sup>13</sup>

Although the size of debt changes among non-increasers ( $\varepsilon$ ) is smaller in absolute terms than the size of debt changes among increasers ( $\varepsilon^+$ ), the low percentage of increasers ( $p$ ) accounts for the decline in total debt. There are simply many more non-increasers than increasers.<sup>14</sup>

More formally, movements in consumer debt generally are more closely explained by movements in the percentage of increasers rather than the size of debt changes. The correlation between the percentage of increasers and consumer debt growth is 94 percent. By contrast, the correlations are approximately 50 percent when using the average size of debt changes among either increasers or non-increasers.<sup>15</sup> Thus, while the average size of debt changes helps explain the peak of the housing bubble, the sharp decline in the percentage of increasers has been the more important factor driving consumer deleveraging.

Eventually, deleveraging in the aggregate will come to an end through a combination of a greater percentage of debt increasers and a shift in the pattern of debt changes toward larger increases and smaller decreases. A counterfactual exercise illustrates the importance of the percentage of increasers and the potential policy implications (Table 1). In the second quarter of 2012, consumer debt was declining on average by \$475 per person (line 1).<sup>16</sup> If the percentage of increasers returned to its pre-bubble average from 2000-01, consumer debt would have been rising by \$351 per person (line 2). Thus, an expansion in the number of consumers who increase their borrowing would halt the deleveraging process, even if the size of those debt increases remained modest in historical terms. But such an expansion could prove counterproductive if the additional consumers who increase their borrowing are ill-equipped to service the debt.

By contrast, suppose that fewer defaults reduced the average size of debt changes among non-increasers back to the pre-bubble average from 2000-01 (line 3).<sup>17</sup> With fewer borrowers taking on additional debt in the second quarter of 2012, however, consumer debt would still have been declining by \$80 per person. Thus, it is not clear that only eliminating consumer defaults would stop deleveraging.

Table 1

## A COUNTERFACTUAL EXERCISE

	Percentage of increasers ( $p$ )	Average size of debt changes among increasers ( $\bar{s}$ )	Average size of debt changes among non-increasers ( $\bar{s}$ )	Average change in debt per person
1. Data, 2012:Q2	31.2%	\$4,041	-\$2,522	-\$475
2. If percentage of increasers returned to 2000-01 average	43.8%	\$4,041	-\$2,522	\$351
3. If average size of debt changes among non-increasers returned to 2000-01 average	31.2%	\$4,041	-\$1,948	-\$80
4. If average size of debt changes among increasers returned to 2002-06 average	31.2%	\$6,164	-\$2,522	\$187

Notes: The average change in debt per person is computed from the formula in the text. Totals may not sum due to rounding.

Finally, suppose that the size of debt changes among increasers returned to its average during the housing bubble from 2002-06 (line 4). Such a scenario would end the deleveraging process, though the debt increases per person would be half as large as those from expanding the percentage of increasers. To the extent that large average debt increases per person were a factor in generating the housing bubble, however, it is not clear that it would be desirable to end deleveraging in such a manner.

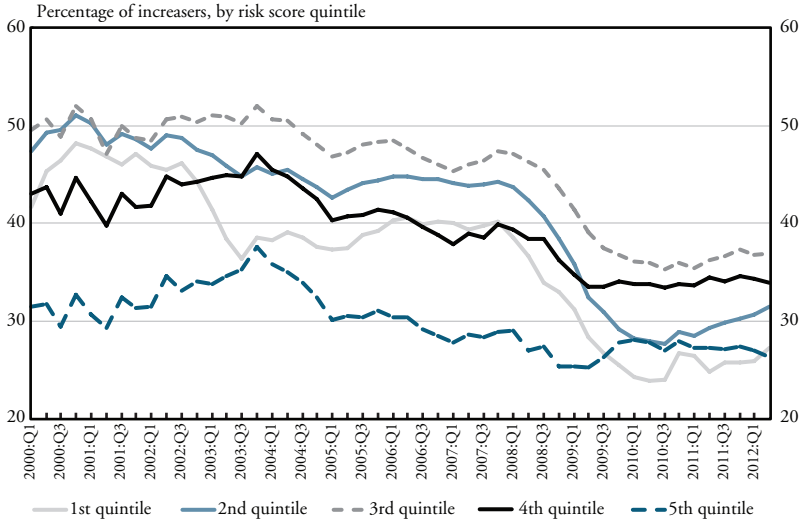
#### IV. WHICH CONSUMERS ARE MOVING THE MARGINS?

Weak borrowing explains most of the recent movements in aggregate consumer debt, as the percentage of consumers taking on more debt fell sharply during the recession and has only modestly recovered, and the size of debt increases fell from its levels during the housing bubble. To the extent that this weak borrowing is inhibiting the recovery, identifying which consumers are or are not borrowing may help in identifying the appropriate policy responses.

This section considers the effect that consumers' perceived riskiness, incomes, and past debt levels have on their borrowing activity. The data show that virtually all types of consumers have reduced their borrowing activity since the early to mid-2000s, including consumers living in high- or low-income areas, those with high or low risk scores, and those living in high- or low-debt regions. Consumers with risk scores in the bottom half of the distribution—that is, individuals deemed to be relatively risky by a credit reporting agency—and

Chart 5

THE PERCENTAGE OF INCREASERS AND RISK SCORE QUINTILES



Notes: Percentages are computed by comparing consumer total debt holdings excluding student loans with their year-ago levels, with quintiles determined by the consumers' risk scores at the beginning of each period. For example, the risk score quintile ranges for the period ending 2012:Q2 are: 1st, less than 597; 2nd, 597 to 677; 3rd, 678 to 752; 4th, 753 to 800; and 5th, higher than 800. Risk scores are based on the Equifax model, in which lower scores (the 1st and 2nd quintiles) denote riskier borrowers compared with higher scores (the 4th and 5th quintiles).

Sources: Equifax, FRBNY-CCP, authors' calculations.

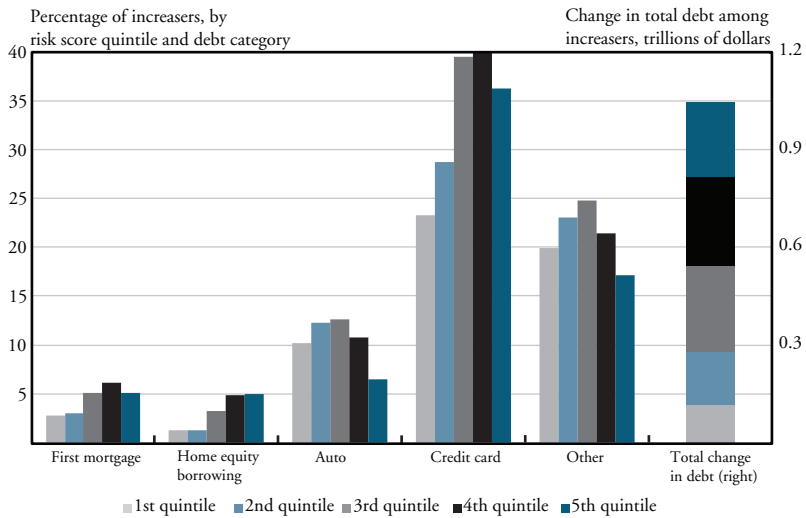
consumers in low-income zip codes appear to be driving the modest rebound in the percentage of consumers who are increasing their debt balances. In contrast, the data show that debt overhang appears to be playing essentially no role in recent movements in the percentage of increasers but a larger role in the size of debt changes.

*Risk scores and consumer debt*

Across the spectrum of risk scores, fewer consumers are increasing their debt levels (Chart 5). Dividing consumers by risk score quintiles simplifies the analysis. The first quintile represents the riskiest consumers; these consumers have the lowest risk scores according to Equifax. The fifth quintile represents the safest consumers, who have the highest risk scores. From their respective peaks to troughs, the magnitude of the declines is ordered by risk score quintiles: the riskiest consumers saw the largest percentage-point decline (24 percentage points) in the

Chart 6

## INCREASERS BY RISK SCORE QUINTILES, 2011:Q2-2012:Q2



Notes: The percentage of increasers and the total debt change among increasers are calculated using data between 2011:Q2 and 2012:Q2. Quintiles are determined by the consumers' risk scores in 2011:Q2. The risk score quintile ranges are: 1st, less than 597; 2nd, 597 to 677; 3rd, 678 to 752; 4th, 753 to 800; and 5th, higher than 800. Risk scores are based on the Equifax model, in which lower scores (the 1st and 2nd quintiles) denote riskier borrowers compared with higher scores (the 4th and 5th quintiles).

Sources: Equifax, FRBNY-CCP, authors' calculations.

percentage of debt increasers, and the safest consumers saw the smallest (12 percentage points). While the middle quintile has consistently had the largest percentage of increasers, the relative positions of the other quintiles have varied over time and each quintile has experienced somewhat different dynamics.

So far in the recovery, only consumers in the riskiest quintiles have seen a rebound in the percentage of increasers. The percentages of consumers increasing debt among the safest quintiles have been flat (fourth quintile) to declining (fifth quintile) over the last two years. Thus, the entire improvement in the aggregate percentage of increasers comes from the riskiest consumers, whose quintiles have shown gains of 3 percentage points. However, the improvement has been small, relative to the declines during the recession.

Some debt categories have been more widely used than others. The increase in borrowing by individuals in the lowest two quintiles over the past year has come almost exclusively from auto, credit card, and other borrowing (Chart 6). These individuals have been unable to obtain fi-

nancing for mortgage-related debt due to tight credit conditions or have chosen to avoid adding such debt. As a result, the percentage of individuals in the lowest two quintiles who added either first-mortgage debt or home equity debt is approximately half that of the top three risk quintiles.<sup>18</sup>

Mortgage debt is a key driver of the size of debt changes. Although the number of individuals increasing mortgage debt is smaller than those in other debt categories, mortgage debt tends to be much larger, meaning these changes have the greatest impact on total debt. Because increases in mortgage balances have been limited among consumers in the first and second quintiles, most of the debt accumulated among increasers in the last year has gone to those with higher credit scores (Chart 6, stacked bar on right). For the year ending in the second quarter of 2012, consumers who increased their total debt loads took on slightly more than \$1 trillion in additional debt. Individuals in the two riskiest quintiles contributed 26 percent of this total, below their pre-2007 average contribution of 32 percent.<sup>19</sup> As credit standards ease and riskier individuals increase their mortgage-related debt, their contribution to the increase in debt balances will likely return closer to historical averages.

### *Income and consumer debt*

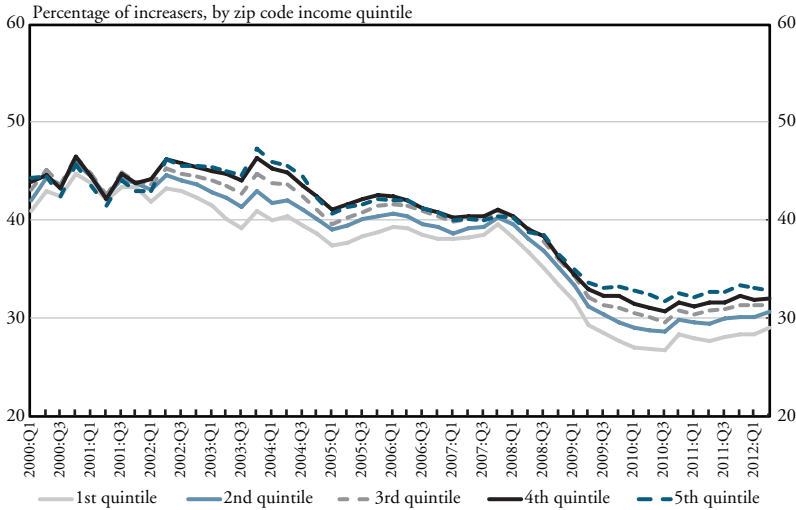
The FRBNY-CCP database collects some information on consumers beyond their debt holdings such as their zip code, but it lacks many relevant variables for explaining the evolution of consumer debt. One such missing variable is consumer income. To proxy for a consumer's income, this article assigns consumers within a given zip code an estimate of the average income for that zip code from tax return data from the Internal Revenue Service (IRS).<sup>20</sup>

Across zip code income quintiles, fewer borrowers were taking on more debt in 2012 than before the recession (Chart 7). The broad contours for all income levels are similar to the aggregate percentage of increasers shown earlier.

However, the variation across income levels also suggests a cyclical pattern. Over the 2001-07 business cycle, the difference between the percentage of increasers in the highest and lowest income quintiles widened early in the recovery, peaking above 6 percentage points in the fourth quarter of 2003. The difference then steadily narrowed as the recovery picked up steam, falling to 1 percentage point in the fourth

Chart 7

## THE PERCENTAGE OF INCREASERS AND ZIP CODE INCOME QUINTILES



Notes: Percentages are computed by comparing consumer total debt holdings excluding student loans with their year-ago levels, with quintiles determined by the consumers' average estimated per taxpayer income by zip code at the beginning of each period. The zip code per taxpayer income quintile ranges are: 1st, less than \$30,960; 2nd, \$30,960 to \$36,365; 3rd, \$36,365 to \$43,379; 4th, \$43,379 to \$55,796; and 5th, greater than \$55,796. Only zip codes that had at least 5,200 estimated individuals with consumer credit records in 2006:Q4 were included. Sources: Equifax, FRBNY-CCP, authors' calculations.

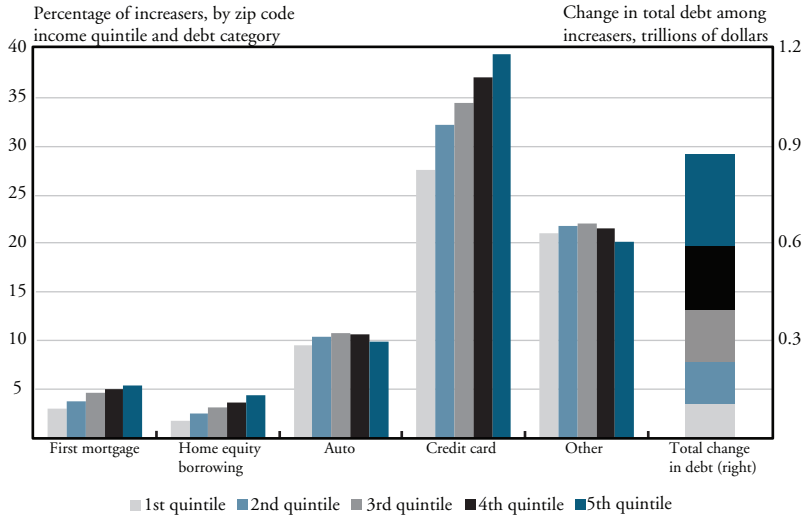
quarter of 2007. A similar pattern is at play in the current cycle. After widening through the recession and early part of the recovery, the difference between the highest and lowest income quintiles peaked at 6 percentage points in the first quarter of 2010. As of the second quarter of 2012, the difference had returned below 4 percentage points.

Driving the widening divergence in the recent recession was a larger decline in borrowing activity among the lower-income quintiles relative to the other quintiles. Since the third quarter of 2010, however, the pattern has reversed: while the percentage of increasers has moved up across incomes, the lowest-income quintiles have experienced the strongest gains.

The dispersion in the percentage of increasers by income quintiles partly comes from demand for different debt products. Over the past year, first mortgages, home equity borrowing, and credit cards have seen higher percentages of increasers at the higher income quintiles (Chart 8). For each of these products, the largest incremental increase

Chart 8

INCREASERS BY ZIP CODE INCOME QUINTILE, 2011:Q2-2012:Q2



Notes: The percentage of increasers and the total debt change among increasers are calculated using data between 2011:Q2 and 2012:Q2. Quintiles are determined by the consumers' average estimated per taxpayer income by zip code in 2011Q2. The zip code per taxpayer income quintile ranges are: 1st, less than \$30,960; 2nd, \$30,960 to \$36,365; 3rd, \$36,365 to \$43,379; 4th, \$43,379 to \$55,796; and 5th, greater than \$55,796. Only zip codes that had at least 5,200 estimated individuals with consumer credit records in 2006:Q4 were included. Sources: Equifax, FRBNY-CCP, authors' calculations.

occurs between the first and second quintiles. By contrast, the percentage of consumers increasing their auto debt and other borrowing has been fairly uniform across incomes.

While the distribution of the percentage of increasers across income levels tends to vary with the business cycle, the size of debt changes is less sensitive to the business cycle and differs significantly across income levels. For the year ending in the second quarter of 2012, the top two income quintiles accounted for 55 percent of the additional debt taken on by consumers who increased their debt loads (Chart 8, stacked bar on right).<sup>21</sup> The lowest two income quintiles accounted for 27 percent, well below their 40 percent share of the population. However, these contributions have varied little over the entire sample, reflecting the generally greater borrowing capacity of individuals with higher incomes.

*Debt overhang and consumer debt*

Researchers have not fully resolved the extent to which debt taken on during the housing bubble continues to weigh on economic activity during the recovery. Mian and Sufi (2011) present evidence that the counties that experienced large build ups in household debt during the boom subsequently experienced weaker economic conditions in the early stages of the recovery as well. In contrast, Krainer (2012) finds that differences in deleveraging between counties that experienced high versus low house price appreciation—which may reasonably be presumed to correlate with the size of debt buildups—do not appear to be large in terms of nonmortgage debt.

To capture the effects of debt overhang, this article sorts zip codes into quintiles based on the growth of debt-to-income ratios from 2002 to 2006 and tracks the behavior of individuals based on their zip code of residence at the end of 2006.<sup>22</sup> Thus, individuals who lived in high debt-to-income growth zip codes at the end of the bubble presumably were more leveraged at that point than those living in low debt-to-income growth zip codes.<sup>23</sup>

In the aggregate, the peak of the housing bubble did not coincide with a large percentage of consumers increasing their total debts, but rather with a large average size of debt changes among the increasers (see Charts 3 and 4). However, the aggregate data hide important geographical variation.

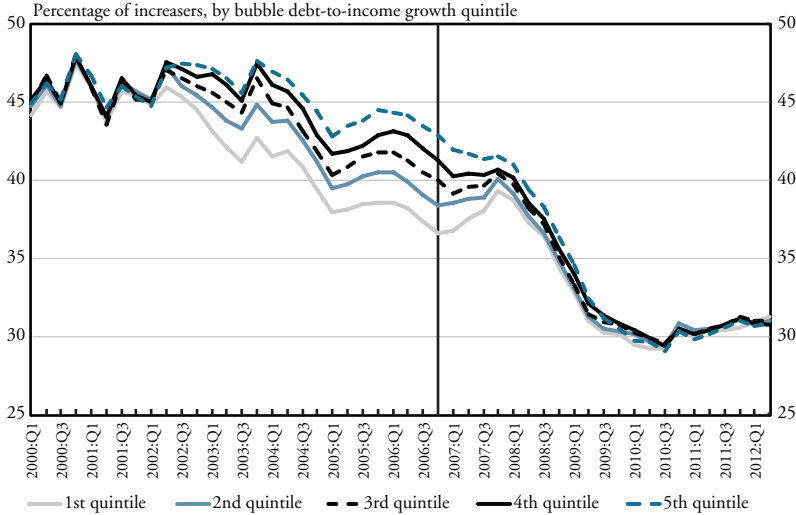
As of the fourth quarter of 2006, areas that experienced the greatest growth in debt-to-income ratios during the housing bubble had a relatively large percentage of consumers increasing their debt (Chart 9). The opposite was true in areas where debt-to-income growth was subdued, as relatively few individuals were taking on more debt.

Soon thereafter, however, geographical discrepancies effectively disappeared. As the housing bubble began to deflate and the economy tipped into recession, the percentage of increasers converged across the country. Since the third quarter of 2010, the rebound in the percentage of increasers has been uniform across the country, regardless of whether individuals lived in areas that had experienced rapid or slow growth in debt during the bubble. Thus, debt overhang has played virtually no role in movements in the percentage of increasers during the recovery.<sup>24</sup>



Chart 9

THE PERCENTAGE OF INCREASERS AND DEBT OVERHANG QUINTILES



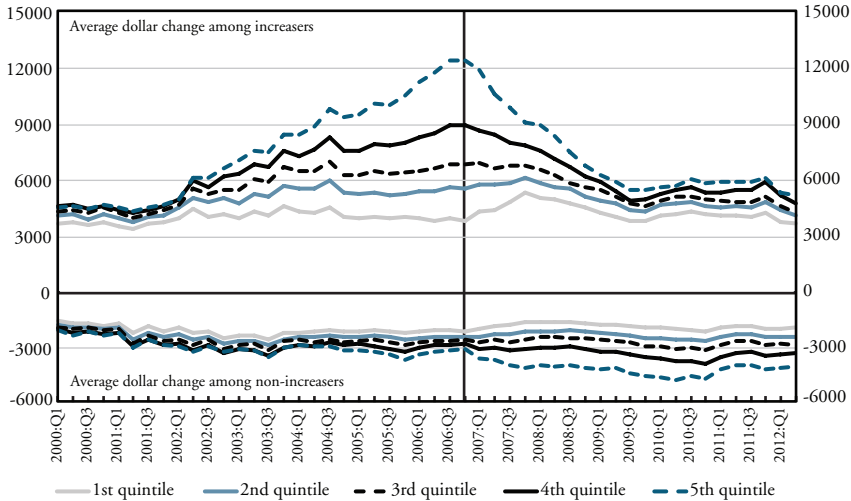
Notes: Percentages are computed by comparing consumer total debt holdings excluding student loans with their year-ago levels. Quintiles are determined by growth in debt-to-income ratios during the housing bubble (2002-06) at the zip code level, and individuals are assigned to a quintile based on their zip code of residence in 2006:Q4. The quintile ranges for debt growth are: 1st, less than -5.0% zip code debt-to-income growth; 2nd, -5.0 to 18.5%; 3rd, 18.5 to 41.6%; 4th, 41.6 to 77.1%; and 5th, greater than 77.1%. Only individuals who were living in zip codes with at least 5,200 estimated individuals with consumer credit records in 2006:Q4 were included. The vertical line denotes 2006:Q4.

Sources: Equifax, FRBNY-CCP, authors' calculations.

Instead, debt overhang has been, and remains, a larger factor in the size of debt changes (Chart 10). In the fourth quarter of 2006, individuals in highly leveraged areas increased their debt loads tremendously compared with those in less leveraged areas. The large increases in debt were commensurate with spiraling home prices. At the same time, debt changes among non-increasers were similar across geographic regions. During the housing bust, debt changes among non-increasers varied across regions as high rates of default and foreclosure in highly leveraged areas translated into larger subsequent declines in debt.

Chart 10

## THE SIZE OF DEBT CHANGES AND DEBT OVERHANG QUINTILES



Notes: Amounts reflect the average quarterly change in debt holdings among those consumers who increased (or did not increase) their total debt levels excluding student loans compared with their year-ago levels. Quintiles are determined by growth in debt-to-income ratios during the housing bubble (2002-06) at the zip code level, and individuals are assigned to a quintile based on their zip code of residence in 2006:Q4. The quintile ranges for debt growth are: 1st, less than -5.0% zip code debt-to-income growth; 2nd, -5.0 to 18.5%; 3rd, 18.5 to 41.6%; 4th, 41.6 to 77.1%; and 5th, greater than 77.1%. Only individuals who were living in zip codes with at least 5,200 estimated individuals with consumer credit records in 2006:Q4 were included. The vertical line denotes 2006:Q4. Sources: Equifax, FRBNY-CCP, authors' calculations.

Given the prominence of the percentage of increasers over the average size of debt changes in driving aggregate debt dynamics, these findings suggest that debt overhang has played a limited role in the subdued pace of the recovery.<sup>25</sup>

## V. CONCLUSION

Consumers have been reducing their debt in the aggregate in the wake of the housing bust and financial crisis. While a portion of this deleveraging has come from defaults and foreclosures on mortgage debt, a key driving factor has been a sharp decline in the number of consumers taking on additional debt. This decline has been widespread, as virtually all types of consumers—high- and low-income, high- and low-risk, those living in high-debt regions and low-debt regions—have reduced their borrowing activity since the early to mid-2000s.

While the number of consumers increasing their debt remains at low levels, it has recently begun to recover modestly. Part of this rebound is coming from consumers who experienced the sharpest declines in borrowing activity, including consumers from lower-income areas and consumers with higher credit risk. Such a pattern is consistent with some easing of tight credit standards. By contrast, geography and debt overhang from the housing bubble appear to be playing a limited role in consumer debt dynamics in the recovery.

With relatively few borrowers taking advantage of historically low interest rates, accommodative monetary policy is less effective than in normal times. Ultimately, ending the deleveraging process will require a broad-based expansion in the set of borrowers who both demand and can service additional debt.

## ENDNOTES

<sup>1</sup>Specifically, the FRBNY-CCP is a five percent sample of the Equifax database. Because of the large size of the FRBNY-CCP, this article uses a smaller (five percent) sample of the FRBNY-CCP for ease of analysis.

<sup>2</sup>The FRBNY-CCP does not contain personally identifying information such as date of birth, Social Security number, or street address.

<sup>3</sup>An Equifax risk score is meant to predict the likelihood of a severe delinquency within the next 24 months. Scores range from 280 to 850, with lower scores representing greater perceived credit risk—that is, a higher likelihood of a severe delinquency.

<sup>4</sup>Jointly held accounts are given a weight of one-half when calculating an individual's total balance. First mortgage borrowing is defined as a closed-end mortgage, positioned ahead of all other mortgages and liens on a property. Home equity borrowing includes both home equity loans and home equity lines of credit. Auto borrowing covers loans provided by banking institutions and automobile dealers for purchasing an automobile. Credit card borrowing includes revolving accounts maintained by banks, bankcard companies, national credit card companies, credit unions, and savings & loan associations. "Other" borrowing comprises consumer finance (personal loans) and retail borrowing from clothing stores, grocery stores, department stores, home furnishing stores, and gasoline chains.

<sup>5</sup>For more information on the FRBNY-CCP, see for instance Lee and van der Klaauw.

<sup>6</sup>An alternative source of data on debt holdings of consumers comes from the Board of Governors of the Federal Reserve System's Flow of Funds (FOF) statistical release. This quarterly dataset contains information on the combined credit market liabilities of households and nonprofit organizations. With its first data points in the 1940s, the FOF is a much longer dataset than the FRBNY-CCP. While rich in aggregate data, details on individual households are not available. In addition, estimates of household and nonprofit data in the FOF "are largely residuals and are derived from data for other sectors," (Board of Governors of the Federal Reserve System, p. 4) except for consumer credit data which are estimated directly. In contrast, data from the FRBNY-CCP are estimates from a representative sample of consumer credit records. A key difference between the FOF data and the estimates from the FRBNY-CCP presented in this article is that this article excludes student loan debt due to difficulties in matching borrowers over time.

Household and nonprofit debt in the FOF peaked at \$13.8 trillion in 2008:Q1, two quarters before (and nearly \$2 trillion greater than) the peak from the FRBNY-CCP. The decrease in debt in the FOF between the peak and 2012:Q2 was less pronounced, at \$0.9 trillion versus \$1.6 trillion in the FRBNY-CCP. In addition, debt essentially flattened out between 2011:Q3 and 2012:Q2 in the FOF.

<sup>7</sup>In this article, “increasers” denotes consumers who increased their debt since the previous period. Thus, a consumer who acquired debt for the first time is an increaser, along with a consumer who added to a previous positive debt balance. This definition differs from the one used in Bhutta. In Bhutta, “increasers” are only consumers who added to a previous positive debt balance; “entrants” are consumers who previously had a zero debt balance and acquired new debt. Together, “increasers” and “entrants” comprise “inflows” in Bhutta.

<sup>8</sup>Distinguishing “increasers” from “non-increasers” is not perfect, because consumers who make no payments on one or more debts may be classified as increasers and thus counted in the percentage of increasers if the value of their debts increases because of accumulated interest payments and penalties. (The “increasers” in Bhutta may also reflect consumers whose debts rise because of unpaid interest and fees.) However, excluding consumers who increased balances on debt products with past due balances produces similar figures to those below.

<sup>9</sup>Computing the percentage of increasers using quarter-to-quarter changes, and then smoothing using a four-quarter moving average, produces generally similar qualitative results, though the levels tend to be lower: all else equal, the probability that debt will rise at some point over a year is greater than the probability of it rising in a single given quarter, in line with the idea that debt acquisition is lumpy.

<sup>10</sup>See Lee and van der Klaauw.

<sup>11</sup>The sizes of debt change become larger in absolute terms for both increasers and non-increasers as the window is shortened because the disappearance and reappearance of credit records contribute disproportionately to the variance of the series. The one-year window is thus a compromise between smoothing over noise and capturing important trends. Bhutta also notes problems with noise in the data that affect the computation of increases and decreases in debt. Bhutta addresses the issue in part by using longer, non-overlapping two-year windows, though it is not clear that this construct completely avoids the problem, and such a construct has the drawback of preventing regular updating of the figures with each new quarterly data release.

<sup>12</sup>One possible caveat to these results is that readings at the end of the sample may reflect fallout from problems with foreclosures at large commercial banks. To the extent that foreclosures may take longer than before, both the percentage of increasers and the size of debt changes among non-increasers may be biased upward.

<sup>13</sup>The average nominal change in debt among non-increasers from 2000:Q1 to 2012:Q2 was  $-\$2435$ , while the 2012:Q2 reading was  $-\$2522$ . Using the price index for personal consumption expenditures to convert the nominal debt changes into 2012:Q2 dollars, the average real change in debt among non-increasers from 2000:Q1 to 2012:Q2 was  $-\$2759$ .

<sup>14</sup>Bhutta presents an alternative framework that arrives at a similar conclusion.

<sup>15</sup>See Braxton and Knotek for additional analysis.

<sup>16</sup>Technically, “per person” refers to individuals with credit records because of the structure of the FRBNY-CCP.

<sup>17</sup>Because the average size of debt increases in nominal terms as of the second quarter of 2012 had essentially returned to its pre-bubble levels from 2000, this exercise effectively considers what would have been occurring to consumer debt in 2000-01 had the percentage of increasers been at much lower levels.

<sup>18</sup>The relatively low percentages of increasers in Chart 6 for first mortgages and home equity borrowing among the riskiest borrowers in the first quintile suggest that negative mortgage-related debt amortization—perhaps due to accumulating fees and interest payments on delinquent mortgages—does not appear to be pushing up the percentage of increasers for these consumers to a large extent.

<sup>19</sup>If each group contributed proportionately to the increase in total debt, the two riskiest quintiles would have contributed 40 percent of the total.

<sup>20</sup>Individuals in the FRBNY-CCP were matched to the estimated adjusted gross income per taxpayer in their zip code of residence based on IRS data. Per-taxpayer estimates of income were calculated by dividing total adjusted gross income in a zip code by the estimated number of taxpayers in that zip code. Estimates for 1999-2012 were calculated by interpolating or extrapolating data from tax years 2001 and 2008, both of which are freely available on the IRS website. While not a perfect substitute for using the actual data from every year, the use of income quintiles reduces the bias from this estimation process. Only individuals living in zip codes with 5,200 or more individuals with consumer credit records in 2006:Q4 were considered to avoid zip codes in which debt changes by a small number of sampled individuals might bias the results. The quintiles were population adjusted so that each quintile includes the same number of individuals.

<sup>21</sup>The total change in debt is slightly smaller than the amount reported in Chart 6 because zip codes with fewer than 5,200 individuals with consumer credit records were excluded from the analysis.

<sup>22</sup>Quintiles of the percent change in zip code debt-to-income ratios from 2002:Q1 to 2006:Q4 were calculated for all zip codes with at least 5,200 estimated individuals with credit records as of 2006:Q4. Zip codes with fewer than 5,200 residents were excluded to avoid possible bias from zip codes with a small number of individuals in the FRBNY-CCP, where movements in debt could be highly idiosyncratic. Individuals were assigned to quintiles based on their 2006:Q4 zip code of residence and remained in that quintile for as long as they were in the sample.

<sup>23</sup>Assigning individuals to quintiles and then tracking the individuals is necessary because individuals may move between zip codes, especially if they are taking on a large amount of new debt related to a house purchase. Thus, this exercise assumes that debt burdens affect individuals rather than zip codes. Nevertheless, simply sorting zip codes into quintiles and keeping the zip codes in those quintiles would generate similar charts, since individual movements were not very large during this time.

<sup>24</sup>It is also possible to counterfactually track individuals prior to the fourth quarter of 2006. This exercise is a counterfactual because individuals were sorted into quintiles based on their zip code of residence in 2006:Q4. Thus, a consumer in 2000:Q1 belongs to a given quintile based on his or her future behavior, which may or may not have been predictable in 2000:Q1. The exercise is illustrative because it shows that at the start of the sample in 2000, consumers across the country were relatively homogeneous, with nearly identical propensities to take on additional debt. As the housing bubble grew, debt behaviors differed widely across geographic regions.

<sup>25</sup>See Braxton and Knotek for additional analysis on factors that appear to influence the percentage of debt increasers and the average size of debt changes.

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