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Charging Up a Mountain of Debt: Accounting for the Growth of Credit Card Debt

Peter S. Yoo

Credit cards have become a noticeable feature on most American households' financial landscape. Data from the Bank for International Settlements indicate that the number of credit cards in circulation increased 34 percent between 1988 and 1994, and the number of credit card transactions increased 55 percent. The data also show that the value of credit card transactions increased 98 percent during the same period. The higher number of cards and their use increased the size of credit card debt, so that total consumer revolving credit outstanding grew from \$175 billion to \$339 billion.

Unfortunately, aggregate data like those above fail to provide information about the composition of credit card debt growth. So it is impossible to tell whether the increased debt arose from a general increase in the number of households or from a larger proportion of households with credit cards. Aggregate data also do not reveal who holds credit card balances—upper- or lower-income households—nor do they indicate which factor contributed more to the growth of credit card debt—an increase in the number of households with credit cards or an increase in average credit card indebtedness. Such detailed information about the components of credit card debt growth is important because each component has different implications for the viability of the growth of credit card debt.

Household data provide some of the information we need to examine the different strata of credit card debt. I use the Surveys of Consumer Finances conducted in 1983, 1989, and 1992 to separate the growth of credit card debt into two categories: Changes in the number of households with credit cards and changes in the amount of credit card debt per household. I can then account for the relative contributions of increases in credit card availability, number of households, and average credit card debt. I also use the household income information to quantify the impact of the increasing number of lower-income households with credit cards.

SURVEY OF CONSUMER FINANCES

The Federal Reserve, with the assistance of other agencies and organizations, conducted the Surveys of Consumer Finances (SCF) in 1983, 1989, and 1992 to obtain detailed information about households' assets, liabilities, income, and use of financial institutions and instruments such as credit cards.¹ Each survey used a random sample of U.S. households with an oversample of high-income and high-wealth households to obtain a detailed, comprehensive, and representative picture of U.S. households. Oversampling is necessary because income and wealth are concentrated among a small number of households, so a random sample of the population misses too many dollars.² The surveys included 4,103 households in 1983, 3,143 households in 1989, and 3,906 households in 1992, but I do not use information for six households in the 1992 survey because of data problems.³ Antoniewicz (1996) and Avery, et al. (1988) found that the information in the survey corresponds fairly closely to the findings of other surveys and aggregate estimates.⁴

Unlike Avery, et al. (1987) and Canner, et al. (1995), who presented detailed information about household indebtedness, I limit myself to examining the relationship between

¹ Avery and Elliehausen (1986), Avery, et al. (1984a, 1984b), Kennickell and Shack-Marquez (1992), and Kennickell and Starr-McCluer (1994) provide more details of the surveys.

² Weicher (1995, 1997a) uses the SCFs to analyze the concentration of wealth among U.S. households.

³ 1989 and 1992 SCFs use five different imputation methods for missing values and reports all five imputed values. This method multiplies the number of observations in each survey by five. I have adjusted for this fact whenever appropriate.

⁴ Antoniewicz compared estimates of total household liabilities from the 1989 and 1992 surveys to estimates from the flow of funds accounts (FFA). For 1989, SCF total household liabilities equal \$3.1 trillion, whereas the FFA estimate is about \$29 billion less, and for 1992, the SCF estimate is \$3.6 trillion, while FFA is about \$116 billion higher. Estimates of consumer credit from the SCF are \$821 billion and \$664 billion for 1989 and 1992, while FFA's estimates are \$807 billion and \$828 billion.

household income and credit cards because income provides the wherewithal to repay debt, and because credit card issuers appear to focus on household income in their credit card applications.

I split the households into income deciles to examine the relationship between household income and credit cards. Parsing households in such a manner creates ranges that are invariant to economic trends that affect the overall economy, so changes in household income that are attributable to inflation or real economic growth do not affect the position of households within the deciles. Separating by deciles also creates partitions that represent 10 percent of all households, thereby eliminating excessive concentration of households within any particular range. Table 1 (p. 9) shows the ranges for the income deciles and the number of households within each decile for the three surveys.⁵ Some income categories, especially the highest ones, may have more observations than others because the surveys used a stratified sampling scheme with an oversample of the high-income and high-wealth households.

WHO HAS CREDIT CARDS?

The increasing number of households that have credit cards undoubtedly contributed to higher total credit card balances, because some of the new cardholders undoubtedly accumulated credit card debt. So it is important to know how the fraction of households with credit cards changed between 1983 and 1989 and between 1989 and 1992. In addition, average credit card indebtedness and the ability to service such debt are likely to vary with income, so we may want to know how the incidence of credit card holders changed for different income deciles, and whether changing incidences affected the characteristics of a typical credit card–holding household.

A majority of American households had some type of credit card in 1983, as shown in Table 2 (p. 10).⁶ In that year, nearly two-thirds of all households—including many low-income households—had some type of credit card. Nearly

one-third of all households in the lowest three income deciles had credit cards.

The surveys reveal three broad patterns. First, the likelihood of a household's having a credit card varies with income: Lower-income households are less likely to have credit cards, and the likelihood of having a credit card increases nearly uniformly with household income. In 1983, a family in the highest income decile was five times as likely to have credit cards than one in the lowest decile. In between, the fraction of households with credit cards within each income group increased as income increased, and in all instances but one, the differences appear to be statistically significant.⁷ The 1989 and 1992 SCFs also show patterns of increasing probability of credit card ownership with income.

Second, the surveys indicate that the fraction of households with credit cards increased over time. By 1989, 70 percent of all households had at least one credit card, and by 1992, the figure had risen to 72 percent. The increases in the proportion of the population with credit cards between 1983 and 1989, as well as between 1989 and 1992, appear to be statistically significant. In addition, the increased credit card ownership rates affected all income groups, although credit card ownership rates among the top half of the income distribution stabilized between 1989 and 1992.

Finally, although all income groups were more likely to own credit cards, lower-income households increased their card ownership rates more than higher-income families. Credit card ownership rates for the bottom half of the income distribution increased from 45 percent in 1983 to 50 percent in 1989 and to 54 percent in 1992, whereas the top half increased from 86 percent in 1983 to 91 percent in 1989, and then dropped to 90 percent in 1992. The income distribution of households with credit cards also shows the increasing importance of lower-income households among all credit card holders; the increases in credit card ownership rates shifted the distribution of households with credit cards toward lower-income households, shown in Figure 1. Three percent of households with

⁵ The households with very high (negative) income often reported large (negative) amounts of income from a professional practice, business or farm, capital gains (losses), other interest income, dividend income, net rent, or trust income. Census estimates of median household income are \$20,346 for 1982, \$27,228 for 1988, and \$30,126 for 1991 (income reported in the SCFs typically is for the year prior to the year of the survey).

⁶ The 1983 SCF identified six types of credit cards: gasoline company, bank (Visa, Mastercard), general purpose (American Express, Diner's Club), national retailer, other store or retailer, and other (rental car, airlines). The 1989 and 1992 SCF identified five types: bank-type, store, gasoline, general purpose and other. I do not distinguish among credit card types nor among households with multiple credit cards.

⁷ I construct the confidence interval using a bootstrap method. I draw 1,000 random samples with replacement from the original survey. I calculate the fraction of the population that had credit cards for each new sample and then calculate the 95 percent confidence interval from the ordered estimates.

credit cards had incomes within the first decile in 1983, and nearly the same proportion of credit card–holding households fell in the first decile in 1989. By 1992, however, 3.5 percent of all credit card–holding households had income within the first decile.

The increasing incidence of credit cards among lower-income households flattened the distribution of households with credit cards between the survey years, indicating more uniform access to credit cards. The fraction of households with credit cards in the top three income deciles was smaller in 1983 than in 1989, while a larger fraction of such households had income between the 10th and 60th percentiles. The distribution of credit card holders continued to shift so that, by 1992, households with income under the 40th percentile accounted for an even larger share of all households with credit cards than in 1983 and 1989.

WHO HOLDS CREDIT CARD BALANCES?

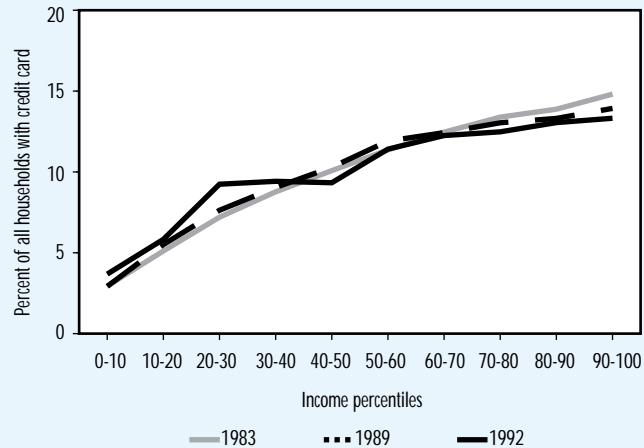
Average credit card debt is the other important factor in determining changes in total household credit card debt. So how has average credit card debt changed over time? Do low-income households carry large balances, and do high-income families use their cards for convenience, paying off their balances in full?

Average credit card debt calculated from the three surveys shown in Table 3 (p. 11) reveal two stylized facts. First, average credit card balances tend to increase with income. In 1983, households in the lowest income decile owed, on average, a total of \$297 on their credit cards, whereas families in the highest income decile owed a total of \$615. Although the differences in average credit card debt between adjacent deciles may not all be statistically significant, total credit card debt and a family's income appear to be positively related. This positive relationship between income and average credit card debt is also noticeable in 1989 and 1992. This conclusion is consistent with other studies.

Second, average credit card debt increased over time. The average household's total credit card balance more than doubled

Figure 1

Distribution of Households with Credit Cards



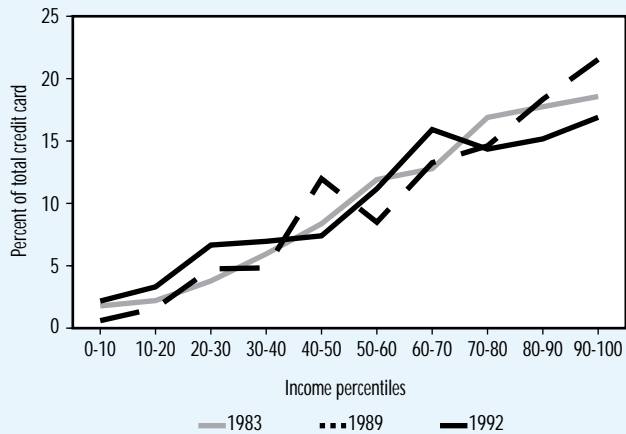
between 1983 and 1989, from \$491 to \$1,064; it increased by nearly 30 percent between 1989 and 1992, to \$1,341. Moreover, the increases in credit card indebtedness occurred for all income groups. Average credit card debt of the lowest income decile increased 167 percent between 1983 and 1992, while the highest decile's average debt increased 177 percent.

Median credit card indebtedness, shown in Table 4 (p. 12), reveals the same basic patterns as average credit card debt. Median indebtedness and income are generally positively related, although the top decile now indicates no median balance in all three years, and median credit card debt increased over time. There are, however, a few differences. First, a majority of households do not have large credit card debt. Second, median debt estimates suggest that mid- to upper-income households are more likely to have credit card debts than lower-income or the highest-income households. Finally, the increases in median indebtedness between survey years are much smaller than the corresponding increases in average indebtedness: 50 percent between 1983 and 1989, and 27 percent between 1989 and 1992.

The previous section shows that, among all households with credit cards, the relative

Figure 2

Distribution of Total Credit Card Debt



number of lower-income households with credit cards increased between 1983 and 1992. So how has the lower-income households' share of total credit card debt changed? The answer is not obvious because, on average, an additional low-income household with a credit card has a smaller effect on total credit card debt than an additional high-income family. Figure 2 shows the distribution of total credit card balances among households, separated by income. Households in the lower half of the income distribution held a small fraction of total household credit card debt—22 percent in 1983, 24 percent in 1989, and 27 percent in 1992. In addition, the distribution of total credit card debt shows some changes in the relative importance of households from different income deciles. The distribution of total credit card debt remained relatively unchanged between 1983 and 1989, but higher incidences of credit card ownership among lower-income households, combined with their large indebtedness, increased their share of total credit card debt between 1989 and 1992.

WHY DID CONSUMER CREDIT GROW?

In 1983, total credit card balances owed by households was nearly \$27 billion. By

1989, that figure grew to nearly \$70 billion, and by 1992, it stood at \$92 billion. Two factors already mentioned—more households with credit cards and larger average credit card debt—account for these changes. Using the data at hand, I can attribute the increases in debt to those two factors by holding one factor constant while changing the other. So the effect of more cardholders equals the change in cardholders times the average credit card debt for the base year. Similarly, the effect of higher indebtedness equals the number of cardholders in the base year times the change in average debt. There is a third term, which accounts for the interaction of new cardholders and higher average balances. Figure 3 shows the relative contributions of the three factors to the growth of credit card balances.

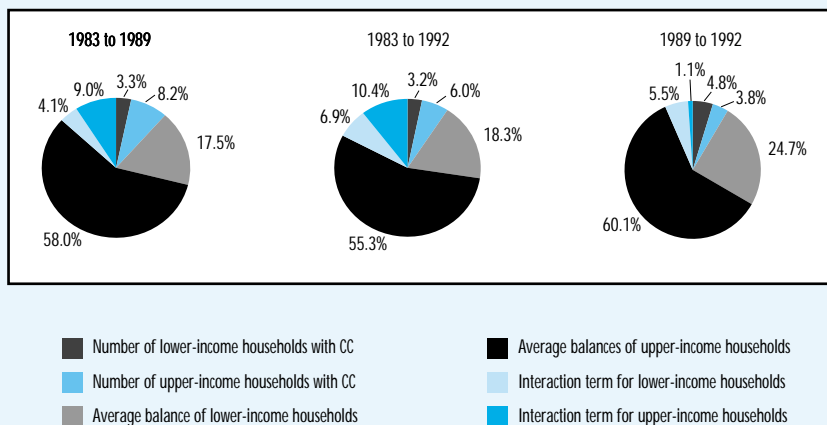
Changes in the number of households with credit cards accounted for little of the increase in total debt. The increase in the number of households with credit cards accounted for 11 percent of the growth in credit card debt between 1983 and 1989. More than half of this change may be attributable to changes in the number of households between surveys, shown in Table 5 (p. 13). The number of households grew 11 percent between 1983 and 1989, while the number of households with credit cards grew 19 percent. The remainder of the increase in the number of households with credit cards is attributable to changes in the fraction of households with credit cards. The table and Figure 3 indicate similar changes between 1983 and 1992 as well as between 1989 and 1992.

Changes in average balances account for the vast majority of the increase in total credit card debt between 1983 and 1989. Average debt grew 117 percent between the survey years, while the Consumer Price Index (CPI) rose 25 percent, and the median income of households surveyed grew 23 percent. A similar trend shows up in the changes between the other survey years.

So did lower-income households, those in the bottom half of the income distribution, have much effect on the change in total debt? The data suggest not. Table 5 indicates that the number of lower-income

Figure 3

Accounting for the Growth of Total Credit Card Debt



households with credit cards consistently grew faster than the number of upper-income households with credit cards during the inter-survey years. Moreover, the average indebtedness of lower-income households also grew faster than the average credit card debt of upper-income households. Yet, as Figure 1 shows, nearly two-thirds of all households with credit cards are upper-income households, and these households held nearly three-quarters of total credit card debt, as shown in Figure 2. Therefore, any increase in the number of upper-income households with credit cards, or in the average balances of upper-income households, has a larger effect on the growth of total household credit card debt because upper-income households have a disproportionately large weight. In sum, changes in credit card ownership and average balances of the top half of the income distribution account for nearly two-thirds to three-quarters of the changes in total household credit card debt.⁸

CONCLUSION

Household data from the Surveys of Consumer Finances from 1983, 1989, and 1992 suggest that increases in credit card debt are largely attributable to increased

average credit card debt per household, not from more households with access to credit cards. Moreover, households in the top half of the income distribution account for most of the growth of credit card debt, although lower-income households increased their access to credit cards and their average debt at a faster rate than the total population. So most of the increase in credit card debt between 1983 and 1992 is attributable to households with previous credit card experience and with above-average incomes, not to inexperienced, low-income households.

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⁸ Increasing indebtedness of lower-income households may be welfare-improving if liquidity constraints prevent them from optimizing their spending patterns. Cox and Jappelli (1993), using the 1983 SCF, argue that borrowing constraints prevented some households from borrowing as much as they wanted, up to 75 percent less. They argue that if the constraints had been lifted, household liabilities would have increased 9 percent.

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Table 1

Ranges for Income Deciles and Number of Households within Each Decile

| Percentile | 1983 | 1989 | 1992 |
|--------------|-------------------------------|-------------------------------|------------------------------------|
| Total Survey | (-24,062, 3,425,887) 4,103 | (0, 99,491,000) 15,715 | (-1,000,000, 65,300,000) 19,500 |
| 0-10 | (-24,062, 5,230) 388 | (0, 6,000) 1,131 | (-1,000,000, 6,600) 1,419 |
| 10-20 | (5,230, 8,568) 376 | (6,000, 10,000) 1,167 | (6,600, 11,000) 1,317 |
| 20-30 | (8,568, 12,000) 375 | (10,000, 14,000) 1,088 | (11,000, 15,000) 1,359 |
| 30-40 | (12,000, 15,448) 363 | (14,000, 20,000) 1,156 | (15,000, 20,000) 1,432 |
| 40-50 | (15,448, 19,523) 371 | (20,000, 24,000) 1,142 | (20,000, 26,000) 1,456 |
| 50-60 | (19,523, 24,000) 367 | (24,000, 30,000) 1,193 | (26,000, 33,000) 1,456 |
| 60-70 | (24,000, 29,811) 367 | (30,000, 38,000) 1,219 | (33,000, 41,000) 1,468 |
| 70-80 | (29,811, 37,100) 373 | (38,000, 49,000) 1,328 | (41,000, 53,000) 1,561 |
| 80-90 | (37,100, 50,000) 358 | (49,000, 66,000) 1,504 | (53,000, 76,000) 1,904 |
| 90-100 | (50,000, 3,425,887) 774 | (66,000, 99,491,000) 4,796 | (76,000, 65,300,000) 6,136 |

Notes: Ranges shown in dollars. Number of observations in each cell may not equal the total observations because some fall within more than one cell.

Table 2

Percent of Households with Credit Cards, by Income Percentiles

| Percentile | 1983 | 1989 | 1992 |
|--------------|-------------------------|-------------------------|-------------------------|
| Total Survey | 64.40 (63.94, 67.03) | 70.37 (69.41, 71.36) | 71.86 (71.08, 72.62) |
| 0-10 | 19.25 (15.15, 23.38) | 20.53 (17.06, 22.83) | 26.42 (24.26, 28.97) |
| 10-20 | 33.39 (28.43, 38.77) | 38.80 (36.57, 43.32) | 41.89 (38.80, 44.74) |
| 20-30 | 47.11 (42.42, 53.60) | 53.70 (50.47, 57.53) | 66.42 (63.59, 68.90) |
| 30-40 | 57.33 (50.84, 62.19) | 63.60 (59.41, 66.96) | 67.67 (65.25, 70.19) |
| 40-50 | 65.90 (60.98, 72.26) | 72.38 (68.90, 75.50) | 67.03 (64.43, 69.98) |
| 50-60 | 74.28 (69.17, 78.75) | 83.78 (81.16, 85.98) | 81.98 (79.81, 83.77) |
| 60-70 | 81.50 (76.95, 84.98) | 87.49 (85.69, 89.78) | 88.06 (85.99, 89.89) |
| 70-80 | 87.57 (84.06, 91.26) | 91.47 (89.94, 93.21) | 89.67 (87.74, 91.35) |
| 80-90 | 90.79 (87.51, 93.91) | 93.63 (92.14, 94.89) | 93.77 (92.35, 95.06) |
| 90-100 | 96.88 (94.81, 98.47) | 98.00 (97.20, 98.70) | 95.69 (94.71, 96.69) |

Notes: Ninety-five percent confidence interval from bootstrapping in parentheses.

Table 3

Average Credit Card Balances by, Income Percentiles

| Percentile | 1983 | 1989 | 1992 |
|--------------|----------------------------|----------------------------------|----------------------------------|
| Total Survey | 490.81 (451.70, 531.87) | 1,064.14 (1,009.25, 1,115.23) | 1,341.19 (1,283.10, 1,400.79) |
| 0-10 | 297.41 (171.23, 427.39) | 219.42 (153.10, 290.82) | 792.83 (626.37, 920.72) |
| 10-20 | 212.77 (148.82, 389.42) | 307.98 (258.58, 436.10) | 761.93 (530.94, 1,053.23) |
| 20-30 | 257.38 (179.45, 372.26) | 662.59 (517.58, 821.59) | 966.47 (811.91, 1,104.23) |
| 30-40 | 333.39 (247.78, 411.28) | 568.15 (457.86, 646.07) | 990.67 (851.01, 1,107.69) |
| 40-50 | 407.83 (318.50, 509.72) | 1,239.71 (1,051.66, 1,453.18) | 1,063.68 (879.09, 1,248.69) |
| 50-60 | 514.73 (403.48, 633.68) | 758.82 (732.85, 955.20) | 1,313.26 (1,190.67, 1,462.39) |
| 60-70 | 503.13 (415.79, 615.60) | 1,134.45 (895.89, 1,238.31) | 1,741.97 (1,557.63, 1,951.48) |
| 70-80 | 619.16 (478.44, 755.67) | 1,192.85 (1,042.76, 1,388.56) | 1,541.88 (1,384.25, 1,728.51) |
| 80-90 | 627.71 (517.77, 743.73) | 1,466.97 (1,265.16, 1,587.40) | 1,559.20 (1,383.37, 1,755.68) |
| 90-100 | 615.22 (477.99, 744.46) | 1,645.60 (1,463.04, 1,841.15) | 1,701.92 (1,479.50, 1,904.49) |

Notes: Figures in dollars. Ninety-five percent confidence interval from bootstrapping in parentheses.

Table 4

Median Credit Card Balances, by Income Percentiles

| Percentile | 1983 | 1989 | 1992 |
|--------------|-------------------|-------------------|-------------------|
| Total Survey | 100 (70, 125) | 150 (130, 170) | 190 (140, 200) |
| 0-10 | 0 (0, 135) | 0 (0, 70) | 200 (100, 370) |
| 10-20 | 0 (0, 44) | 40 (0, 80) | 0 (0, 0) |
| 20-30 | 0 (0, 54) | 0 (0, 30) | 200 (100, 270) |
| 30-40 | 30 (0, 100) | 0 (0, 20) | 230 (150, 350) |
| 40-50 | 180 (100, 235) | 270 (140, 350) | 200 (140, 300) |
| 50-60 | 160 (100, 285) | 140 (100, 200) | 400 (300, 500) |
| 60-70 | 152 (80, 250) | 300 (200, 300) | 400 (350, 560) |
| 70-80 | 200 (100, 300) | 300 (250, 500) | 250 (200, 350) |
| 80-90 | 134 (62, 300) | 450 (300, 550) | 200 (120, 300) |
| 90-100 | 0 (0, 36) | 0 (0, 0) | 0 (0, 0) |

Notes: Figures in dollars. Ninety-five percent confidence interval from bootstrapping in parentheses.

Table 5

Comparison of the Growth Rates of Factors Affecting Total Credit Card Debt (percent)

| Factor | 1983 to 1989 | 1983 to 1992 | 1989 to 1992 |
|--------------------------------|--------------|--------------|--------------|
| Total credit card debt | 159 | 243 | 32 |
| Number of households | 11 | 14 | 3 |
| Number of households with CC | 19 | 25 | 5 |
| Number of lower-income with CC | 24 | 38 | 11 |
| Number of upper-income with CC | 17 | 19 | 2 |
| Inflation (CPI) | 25 | 41 | 13 |
| Median household income | 23 | 33 | 8 |
| Average CC debt | 117 | 173 | 26 |
| Average CC debt, lower-income | 125 | 198 | 33 |
| Average CC debt, upper-income | 116 | 172 | 26 |