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Easy Money?: Health and 401(k) Loans

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Abstract

Rising health care costs and declining personal savings rates are nearly synonymous with household medical debt. For some, defined contribution (DC) retirement savings plans provide a ready source of funds to meet these medical debts. We examine whether health status and health insurance coverage predict the likelihood of having a DC loan using data from the Federal Reserve's triennial Survey of Consumer Finances from 1989 to 2007. We find that poor health raises the likelihood that a household will borrow from their DC plans, even controlling for other forms of debt, access to credit, and whether households are covered by health insurance. Our estimates of the amount of the DC loan, taking selection effects into account, indicates that DC loan amounts are also influenced by health status; those with poor health borrow more from their DC plans. Apart from health status, once a household decides to borrow from their retirement funds, race and education also influence how much to borrow. We argue that public policy can improve the long-term financial retirement security of households by offering more opportunities to save for medical emergencies, while cautiously maintaining the opportunity to borrow from DC plans.

Key words: Defined contribution retirement savings plans; pension debt; health insurance coverage; health status.

I. Introduction

Medical debt has become increasingly commonplace. Frequently, households rely on debt to finance health care, as health insurance coverage has declined, out-of-pocket expenditures have increased, and health care costs have risen. Loans from defined contribution (DC) retirement savings plans, such as 401(k) plans, are among the most easily accessed resources because savers act as lenders to themselves. As DC plans have become more prevalent, households have increased access to this type of loan. Not only has the prevalence of DC plans increased, account balances have grown and more employers offer the option to borrow from DC plans to their employees. All of these factors increase a household's ability to borrow from itself.

The financing of unexpected emergencies, such as medical care, is one reason for allowing loans from tax-advantaged retirement accounts. The logic is that households will accrue savings in their retirement accounts faster if they know that they can access those funds in an emergency. On the other hand, rising medical debt is one of the most consistent predictors of personal bankruptcy. The personal bankruptcy rate has risen over the decades along with growing personal debt, especially medical debt.

The ease with which DC loans can be accessed, though, may mean that these loans are used for a variety of consumption purposes, including all kinds of goods and services. It is possible that DC loans are systematically related to a number of factors other than health status, for instance, homeownership or educational levels.

Understanding the reasons why people borrow from their retirement plans has clear policy implications. DC loans may pose a dilemma for policymakers if these loans are related to health status and health insurance coverage. The money in such accounts is intended to supplement other retirement income. A number of federal tax incentives support this goal. People, though, may borrow from their DC plans to pay for their health care. This medical debt could reduce their retirement savings to pay their current medical bills and increase the chance of future bankruptcy. More DC loans may consequently reduce immediate hardships for households, but increase future financial insecurity.

In this article, we focus on the relationship between health status, access to health insurance, and the likelihood of having a DC loan and the loan amount. We find that households with a household member in poor health are more likely to borrow, and borrow larger amounts, from their DC plans than do healthy households. Health status is, in fact, as important as or even more so than other potential reasons for DC loans such as education and homeownership. The link between health status and DC loans remains even when we control for health insurance coverage. Even those households with health insurance tend to systematically increase their probability of borrowing from DC plans when a family member is in bad health.

The rest of the paper is organized as follows. We provide an overview of the relevant literature in section II, followed by a discussion of some summary data in section III. Our

multivariate analyses of the links between health status, health insurance coverage, and DC loans follow in section IV. Section V contains our concluding remarks.

II. Literature Review

a. Effects of DC Loans

Defined contribution account loans are an odd sort of loan. The odd part of these loans is that credit approvals and the ability to pay back the loan are not subject to outside review. With this type of loan, the borrower is also the banker, albeit within some limits (GAO, 1997). People with a DC plan may borrow \$50,000 or one half of the vested balance from the account, whichever is lower. Loans must be repaid within 5 years, except for loans used for the first-time purchase of a home, which can be repaid over 15 years.

The interest rates on these loans are generally favorable. For instance, in 1996, it was “found that about 70 percent of the 401(k) plans that allow[ed] borrowing, charge[d] an interest rate equal or less than the prime rate plus one percentage point, while less than 10 percent charge[d] and interest rate equal to the local bank’s lending rate.” (GAO, 1997) The repayment of the loan is not tax deductible, though, and neither are the interest payments unless the loan is secured by the primary residence.

Borrowers incur tax liability and in some cases penalties if they do not repay the loan to their plan. If this happens, the outstanding loan amount is considered a taxable distribution from the DC plan. In particular, if the borrower is younger than 59-½, they will have to pay income tax on the outstanding loan amount plus an additional 10% as excise tax. If they are older than 59-½ years, they are no longer subject to the excise tax, but still have to pay the income tax.

The economic rationale for DC loans is that savers will contribute more to their retirement accounts if they know their savings are accessible for short-term borrowing. The existing research finds that the option to borrow against vested pension plan balances raises workers’ contribution amounts.¹ Based on the 1992 Survey of Consumer Finances, GAO (1997) finds that a loan option increased the contribution rate. Similarly, VanderHei (2001) found that a loan option increased the contribution rate by 0.6 percentage points compared to participants who did not have such a loan option.

DC loans, though, can substantially reduce the amount of savings that will be available for retirement. A loan taken out early in a worker’s career can reduce retirement savings by more than 20% (Weller and Wenger, 2008; Munnell and Sundén, 2004; GAO, 1997).² Part of the reason for the reduction in retirement savings is quite direct. Workers who

¹It is important to note that loan options are much less frequently studied than other features, such as employer matches, as a potential incentive for employees to save more in their DC plans. See Choi, Laibson, and Madrian (2004), for instance, for a summary of some of the relevant literature.

² There may be an offsetting benefit from DC loans. The reduced liquidity constraint may entice savers to contribute more to their retirement savings accounts than they otherwise would have (Choi, Laibson, and Madrian, 2004; GAO, 1997; Vanderhei, 2001).

borrow may not pay their loans back. Additionally, some workers may suspend contributions to their DC plan when they have a loan – losing both their contribution and their employers matching contribution. Finally, a worker may lose his or her job – when this occurs most plan sponsors require repayment of the loan in full on very short notice. Workers who turned to their DC plan because they could not secure a third party loan may default on the loan and pay a penalty. Finally, because workers typically pay low interest rates on their loans the rate of return on repayment to their retirement account is typically below the average return. Simulations, by the GAO (1997) indicate that even when the household maintains plan contributions during the loan period, total plan balances are 2-7 percent below the no-loan balance.

There are also a number of thornier technical issues in this debate. Whether a household is better off borrowing from their 401(k) plan (rather than from the market) is also a function of market timing. By taking a loan, a household effectively times the market by selling a share of assets at one time. Ideally the household sells assets when they are dear and repurchases them after they fall. The opposite may also occur and households may end up with considerably less retirement savings a result of poor timing. This issue relates directly to risk reduction associated with dollar cost averaging. Dollar cost averaging reduces market-timing risk by spreading investments over long periods. However, borrowing from your account raises timing risk. Consequently, the cost associated with borrowing against your DC plan is difficult to price, since it includes this market timing risk.

Given the potential for considerable retirement savings reductions associated with DC loans, some policymakers may thus consider restricting loans from DC accounts. Restrictions on DC loans, though, may impede other policy goals if such restrictions make it less likely for savers to pay for unexpected and large consumption needs, such as health care emergencies.

b. Reasons for DC Loans

DC loans have grown in importance over time, reflecting wider use of retirement savings accounts and larger account balances. A few previous studies have described the growth of DC loans. Sundén and Surette (2000), for example, find that the share of households that have a DC loan outstanding rose to 5.3% in 1998 from 2.1% in 1992. VanderHei et al. (2007) more recently report that an average of 18% of people with a 401(k) plan had a loan outstanding in 2006, compared to 19% in 2005 and 18% in both 2000 and 1996. This means that more people, and a greater share of the population, had DC loans over this 10-year period because the share of people with a 401(k) plan has also grown.

The reasons for DC loans are not widely studied. Sundén and Surette (2000) summarize data from the 1998 Survey of Consumer Finances, and find that 37.7% of loans from DC plans were taken out for a home purchase, improvements, and repairs; another 21.6% of loans were borrowed to consolidate bills; followed by 16.5% for car purchases; and the remaining reasons being education (9.6%), non-durable consumption (8.5%), medical,

legal, or divorce expenses (4.5%), and investment purposes (1.6%). There is no analysis so far of the link between health status, health insurance coverage, and DC loans.

c. Health and Debt

The literature on health status and personal wealth, however, indicates that poor health status is associated with less wealth and more debt. A decline in health is typically accompanied by a decline in wealth (Smith, 1998), although the causal direction between health and wealth is not always clear. Similar to the findings we present, Berkowitz and Qiu (2006) conclude that households with a sick household member have had to spend more of their savings, and borrow more to cover medical expenses, regardless of health insurance status.

Health insurance coverage tends to play a mitigating factor in the drop of wealth and the increase in borrowing that is associated with poor health status, but this mitigating effect has decreased over time due to cost shifting within the health insurance industry. Shifts in industry practice designed to increase cost sharing, have led to higher premiums and co-pays for the insured. Growing out-of-pocket expenditures such as some prescriptions, medical supplies, and eyewear impose additional expense upon households. Other health needs insufficiently covered by health insurance include mental health services, substance abuse treatment, nursing home and other long-term care facility stays (Jacoby and Warren 2006, Hong and Kim 2000, Palumbo 1999). Dental and eye care services require separate insurance plan premiums, co-pays, and direct costs (Hong and Kim 2000).

The uninsured and partially insured consume less medical care, yet are likely to incur greater medical debt than the insured. The former groups have fewer assets and thus are more reliant on credit cards for borrowing. Uninsured individuals and households consume less health care, and thereby incur lower out-of-pocket expenditures, as compared to the insured (Zeldin and Rukavina 2007, Hong and Kim 2000). Those with insurance still incur some medical debt due to required out-of-pocket expenditures (Jacoby and Warren 2006). Among households with medical debt in the United States, though, average credit card debt for medical expenses was higher among those without health insurance, at \$14,512, as compared to those with health insurance, at \$10,973 (Zeldin and Rukavina 2007).

Over time, medical debt may have increased among both the uninsured and the insured due to rising costs. The emergence of ‘medical credit cards’, a niche market specifically covering out-of-pocket medical expenditures speaks to the mounting level of medical debt for both insured and uninsured households (Jacoby and Warren 2006). Other forms of medical debt are home equity loans and general credit cards (Zeldin and Rukavina, 2007). As the need to borrow for medical expenses has risen, access to DC loans has also grown. DC loans may thus have played a growing role in helping households pay for medical expenses.

III. Summary Data on DC Loans

We use data that allow us to compare trends over time, but also offer comprehensive details on borrowers. The Federal Reserve's triennial Survey of Consumer Finances (SCF) provides detailed information on households' assets and debts, including DC loans. Consistent data for our descriptive statistics are available from 1989 to 2007. To ensure adequate sample sizes, we combine the first three years of data (1989, 1992, 1995) and the last four years of data (1998, 2001, 2004, 2007) for our descriptive data analysis. Furthermore, our analysis focuses only on households between the ages of 25 and 64.

The data are all survey based with households as the units of analysis. This has several important implications for our research. First, all demographic characteristics, such as educational attainment, race and age, refer to the head of household, unless otherwise indicated. This also implies that we assume, in line with previous research, that DC loans are fungible between different DC plans owned by household members. Second, we rely on the information provided by the respondent about their DC plan, DC loans, and DC plan characteristics. The Federal Reserve imputes answers for respondents who indicate that they do not know the answers to questions pertaining to plan characteristics, such as the permission to borrow from a DC plan. But, we rely on a household's answers to questions about loan amounts and reasons for DC loans.

a. DC Plan and Borrowing Prevalence

Table 1 indicates that both the percent of households with DC plans, and the percent with the ability of households to borrow against these plans increased from 1989 through 2001. The increases moderated after 2001, however it is difficult to determine if this is due to the business cycle or market saturation. The percentage of households with DC plans that also have a DC loan has more than doubled rising from 4.2% in 1989 to 10.9 in 2007. The number of households with a DC loan has increased dramatically since the share of households with a DC plan increased by 16.3 percentage points as well. Combining these estimates implies that approximately one percent of households had a DC loan in 1989 (.042*.251), while 4.5 percent of households have a DC loan in 2007 (.109*.414)

The changing composition of households with loans, and the increasing availability of loans makes it difficult to assess the overall trend in loan amounts. From 1992 loan amounts have increased and peaked in 2004, despite the wide availability of easy credit outside of DC loans. The median loan amounts were still higher in 2007 than at any point after 1989.

The combination of many more people with DC loans, larger account balances, and generally higher loan amounts also translated into a six-fold increase in the total dollar amount of outstanding DC loans from \$4.2 billion in 1989 to \$26.2 billion in 2007.

[Insert Table 1 here]

b. Reasons for DC Loans

The SCF provides information on the reasons for DC loans. These data, though, are somewhat limited. First, the data on the reasons of DC loans are available from 1998 forward. Second, the reasons for DC loans are grouped into ten broad categories in the public use data (see Table 2). Third, the survey asks respondents about the reason for borrowing, not the actual purposes for which the loan was ultimately used. A related point is that household funds are fungible across categories; the reason for the loan may not be the factor that initiated the borrowing. If there are systematic differences between the intent of the loan and its actual use then these categories may not provide an accurate picture of the determinants of borrowing.

Our analysis of the DC loan reasons data is shown in Table 2. We calculate the frequency of loan reasons for all households with loans (top panel) and the composition of DC loan amounts by reason for borrowing (bottom panel). Our results indicate that the reasons for DC loans have shifted over time. The share of loans for goods and services among stated DC loan reasons increased by 23.2 percentage points from 1998 to 2007, while the share of loans for home purchases decreased by 21.5 percentage points. This is unsurprising since access to mortgage credit dramatically increased over this time period.

The distribution of DC loans mirrors these changes. The share of total DC loans borrowed to finance goods and services grew the fastest, an increase of 32.8 percentage points from 1998 to 2007 and the share of DC loans for home purchases declined the most with 20.9 percentage points during the same period (Table 2). Our primary interest is on DC loans for health care. The public use SCF data combines loans for health care with loans for education and other professional services³. The data on loans for health care and professional services shows that fewer people indicated that they had borrowed for these reasons in 2007 than in 1998, but the share of these loans out of total loans increased. This suggests that the typical DC loan amount for education, medical and other professional services has grown faster than the DC loan amount for other reasons.

[Insert Table 2 here]

c. DC Loans and Demographics

A breakdown by demographic characteristics of DC loan borrowers, including health status, homeownership, and education provide additional insights into the reasons for such loans, because DC loans are systematically correlated with particular characteristics. We can use data for all years, from 1989 to 2007, and not just from 1998 to 2007 by foregoing the use of the loan reasons measure.

Table 3 summarizes the DC loan data by demographic factors. We calculate the distribution of households with and without DC loans by demographic characteristics

³ Variables not included in the public data set are available only to the project staff working on the SCF. The Federal Reserve BOG makes no routine provision for access to the restricted SCF data.

from 1989 to 1995 in the left panel and the same distribution from 1998 to 2007 in the right panel of Table 3. Each panel shows the ratio of the demographic distributions among households with loans and without loans. A ratio greater than one indicates that households with a particular characteristic – homeownership, poor health, among others – are overrepresented among households with DC loans. A ratio of less than one indicates that a group is underrepresented among DC loan borrowers.

The differences across groups show that poor health is associated with a slightly higher likelihood of DC loans in the early period (1989-1995), whereas the likelihood of having a DC loan is considerably higher for those with poor health in the later period (1998-2007). This is demonstrated by the ratio in columns 3 and 7 exceeding one. Households with two household members in poor health are overrepresented among DC loan borrowers. Finally, the overrepresentation of DC loan borrowers is greater among households with two household members in poor health than among households with only one household member in poor health. The implication of this increase in the ratio is that poor health status has become an increasingly important factor in determining who has a DC loans.

We can discern no systematic relationship between health insurance and DC loans from these data. Readers might be concerned that because most households in our sample receive group health insurance through their employer, that selection issues drive the lack of a relationship between DC loans and health insurance. While few workers without employer-sponsored health insurance plan are likely to be offered or participate in a DC pension plan, the results in Table 3 indicate that controlling for health insurance status results in no change in the likelihood of having a DC loan for those with DC plans, nor does omitting health insurance from the model influence the effect of poor health on DC loan probabilities.

[Insert Table 3 here]

We also examine the linkages between personal attitudes and DC loans in Table 3. The planning horizon variables measure the time period for which the household is saving into five categories, ranging from a few months to more than a decade and the savings behavior measure groups households into savers and non-savers. Unsurprisingly, shorter planning horizons are consistently related to more DC loans. This overrepresentation rate is quite large (1.6 in the latter period), but it is on par with having a household member with poor health. In comparison, overrepresentation of non-savers (households that report spending all or more than their income) is less than the overrepresentation of households with health problems among those with DC loans.

IV. Multivariate Analysis

Our initial analysis suggests a link between health status and DC loans. Consequently we are interested in specifying a multivariate model that examines two potential relationships: 1) the effect of health status on the likelihood of having a DC loan and 2) the effect of health status on the DC loan amount – controlling for the selection effect of being a borrower. We provide three sets of analyses to accomplish this. First, for those

with DC plans, we estimate the effect of poor health on the likelihood of having a DC loan using a simple probit estimation. Second, we estimate the effect of poor health on the inflation-adjusted amount of the DC loans using a Tobit regression. This allows us to estimate both the probability of having a loan and the loan amount simultaneously. Finally, we examine the reasons for borrowing and compare reasons for those households with and without members in poor health. The first two steps only tell us if health status is correlated with more debt, but not what the additional debt was used for. We thus confirm that health status is linked to the probability and amount of DC loans for medical and other professional services – the supra-loan category in our data – as a third step. This final step is based on a limited sample and leads us to some tentative conclusions about whether health status leads to more medical debt in DC plans.

a. Health Status and the Probability of Having a DC Loan

In Table 4 we present our analysis of the determinants of the DC loan probability using a probit regression. The dependent variable takes the value of “1” when the household has such a loan and “0” otherwise. We include demographic, economic, and personal characteristics as explanatory variables. The demographic variables include race, ethnicity, gender, age, marital status, and health status. Our economic variables are (logged) income,⁴ education, health insurance coverage, homeownership, and employment. Income serves as a measure of collateral for any form of debt and thus proxies for the additional financial resources of the household. Consequently, we do not include other assets in addition to income in our analysis.⁵ We also include the attitudes relating to planning horizons and savings behavior. We test alternative specifications by adding year dummy controls and by eliminating those who used their loan for their primary residence from the analysis.

Our expectations for a number of variables are straightforward. We expect health status to be positively correlated with a greater likelihood of loans since health care costs may not be covered by insurance and formal credit markets may not offer the same easy access to finance medical debts. The relationship between education and the probability of having a DC loan is somewhat complicated. We expect households with more formal schooling to have a higher likelihood of DC loans, after controlling for age, since investments in education are often hard to collateralize in the private sector, requiring households to borrow money elsewhere (e.g. government subsidized loans). However, traditional patterns of educational attainment are for household members to complete their education before entering the labor market. Consequently many workers will pay down their educational debt prior to building enough assets in their DC plan to warrant accessing a DC loans. Households with less formal educational attainment will have entered the labor force earlier and then may decide to take a DC loans to pay for additional schooling. Given this traditional pattern of educational investment and the alternative mechanisms for funding we anticipate that the probability of having a DC loan

⁴ We drop 19 observations or 0.2% of all observations, where the household reports zero income. This does not affect our results in any material way.

⁵ Inclusion of other forms of debt or assets, such as consumer debt and home equity, do not materially affect the relationship between health status and the probability of having a DC loan.

will generally decrease with education. We also expect homeownership to be positively correlated with DC borrowing since loan-to-value amounts typically could not exceed 90% without incurring additional costs such as mortgage insurance. We are especially interested to see if poor health is systematically linked to DC loans, even when we control for health insurance coverage. We also expect that shorter planning horizons and less willingness to save to be positively correlated with a higher likelihood of DC loans. DC loans should have an inverted U-shaped relationship to age, such that they first rise with age and then decrease.

The expected signs for all remaining variables are ambiguous and serve to control for preference heterogeneity. There is no clear theoretical link between loans and income, for instance. More income means more collateral, which makes it easier and less costly to get credit, but also reduces the demand for loans. The demand for DC loans also goes up with unemployment, but, at the same time, it is harder to get a DC loan since employers who administer DC plans often restrict loan access upon the termination of employment.⁶ And, there is no theory linking marital status, race, and ethnicity to DC loans.

We present our estimates of the determinants of the probability of having a DC loan in Table 4; we include both coefficients and marginal effects to ease interpretation. Marginal effects indicate the probability of having a DC loan based on the marginal change in one attribute, holding all other attributes at their observed values (i.e. average marginal effects, as compared to marginal effects at the mean).

We present three specifications to demonstrate robustness. These include a baseline model without controls for the time periods, an extended model that includes year dummies, and a restricted sample that excludes DC loans for the primary residence since those are governed by different repayment rules and statutory borrowing limits. The restricted sample excludes data from 1989 to 1995 since the data on loan categorization are not available for earlier years.

The estimation results highlight a strong link between poor health and DC loans. Poor health is consistently, significantly, and positively correlated with the probability of having a DC loan, conditional on having a plan that allows for borrowing. The estimated marginal effect indicates that having a member of the household in poor health increases the probability of having a DC loan by approximately 4 percent, regardless of specification⁷. Our results hold after we control for health insurance coverage. Health insurance coverage has no systematic relationship to DC loans in any of our regressions.

[Insert Table 4 here]

⁶ Employees can still withdraw funds.

⁷ We estimated a number of alternate specifications to test the robustness of these results. In particular, we estimated the model with different measures of health. We included a continuous measure of health ranging from 1-4 as well as three indicator variables for health. None of the estimated effects were substantively changed as a result of changing the health measure.

Health status is a comparatively strong predictor of DC loans, when compared to other categories, such as homeownership. Health status, for instance, has a larger effect on the probability of a DC loan than homeownership, which is only marginally statistically significant in one specification and a marginal effect that is half the size of the effect of being in poor health. This may partly be due to the time period under investigation, during which mortgage debt became increasingly prevalent and easily accessible. Consequently, potential homeowners need not rely on their DC plan to purchase a home.

The chance of a DC loan approximately declines with education. Households who have only a high school degree or some college education are respectively 3.5% and 3.3% more likely to borrow from their DC plans than those who have completed college. One interpretation may be that households with more educational attainment completed their education before entering the labor force, while those with less formal education may use the ability to access DC loans to pay for additional education, while they are working.

Households who identify as “savers” are 2.7% to 3.7% less likely than non-savers to have a DC loan, while households with a longer planning horizon reduce the chance of a DC loan by 1.4% for each step in lengthening the planning horizon (see Table 4 for a delineation of the planning horizons). Having one additional household member in poor health thus has a similar absolute impact on the likelihood of having a loan as being a saver and or of a high school education compared to a college graduate.

b. Health Status and DC Loan Amounts

Our next set of results examines whether health status is systematically linked to DC loan amounts. We estimate three models to test the robustness of our conclusions controlling for self-selection into having a loan. The three models include: a baseline model without year dummies, an extended model with year dummies, and a model with a restricted sample for the years from 1998 to 2007 without DC loans for primary residences.

The explanatory variables are the same as before with one difference. We use the ratio of other consumer loans, excluding pension loans and home mortgages, to income and home equity as measures to capture how financially constraint a household may be. Less debt to income and more home equity should be correlated with fewer DC loans since households demand fewer DC loans as a result of additional resources.

We use a Tobit model and present the results in Table 5. The data are left-censored at zero, which is the primary rationale for our choice of a Tobit regression. We also consider the decision to borrow from a DC plan and how much to borrow as a joint decision, justifying a Tobit model, rather than a sequential selection model, such as a Heckman selection estimation. It seems reasonable that the household decides how much to borrow and where to borrow the money from at the same time, rather than to assume that the household first applies for a DC loan and then decides, based on the lender’s decision, how much to borrow. The lender and the borrower, after all, are the same

people. Consequently, the loan qualifications and the amount are determined autonomously within parameters set by the employer.⁸

In our case households with no DC loans have ‘genuine zeros,’ these zeros are not truncated measures as would be the case with the standard Heckman wage model. Consequently, we turn to the question of whether the “choice to consume is influenced by the decision of how much to consume” (Jones, 2000). For the reasons indicated above, the decision on both the extensive and intensive margin (to borrow and how much) is simultaneous. These decisions are associated with generalized Tobit models.

In general, our Tobit results support our hypothesis that health status raises both the probability of DC loans and the amount borrowed. Most of the variables in our models show either the expected signs for the estimated parameters or are statistically insignificant.⁹ Poor health is consistently statistically significant and positive in determining the total loan amount (Table 5). These results are independent of the time period we select as our sample. Our third model, which excludes DC loans for households’ primary residence, covers only years after 1995. The results do not change materially and our primary conclusion remains that loan amounts are positively correlated with the number of household members in poor health.

DC loans are also systematically linked to a household head’s age. The amount borrowed increases with age, until age 46 where it begins to decline. This reflects two competing trends. First, the initial increase reflects the fact that households first need to build up DC account balances before they can borrow from their DC accounts. Consequently, older households will have larger account balances and can thus borrow more. However, having more resources later in life, reduces the need to borrow.

Loan demand matters for DC loan amounts, as the results in Table 5 show. The amount of available home equity is negatively related to DC loan amounts, suggesting that households with more borrowing opportunities outside of DC loans borrow less from their DC accounts.

Finally, personal financial attitudes are systematically related to the amount of DC loans. Households that self-identify as savers and households that have long planning horizons have systematically smaller DC loan amounts than households who do not self-identify as savers or who have short planning horizons (Table 5).

[Insert Table 5 here]

c. Borrowing for Health Reasons

⁸ We have no additional, relevant plan design information, other than information on whether loans are allowed. We estimate additional models that include occupation and industrial dummies to proxy for design features that may depend on occupation and industry. The results are robust and our conclusions are unaffected by these additional controls.

⁹ Our results are robust to alternative specifications. For example, the results remain materially unchanged when we include occupation and industry dummies for the head of the household and for the spouse. Occupation and industry may proxy for excluded plan design features that may vary across occupational and industrial categories.

Our results so far indicate that poor health is associated with a greater chance of DC loans and a larger amount borrowed from the DC plan. This correlation does not directly confirm that DC loans were actually taken out to pay for medical care. We therefore examine whether poor health is directly related to the probability and amount of DC loans for education, medical, and other professional services or some other reason (see Table 2 for a list of loan reasons).¹⁰

Our approach is simply to investigate whether households with loans for a particular reason were more or less likely to be in poor health. To do this we restrict the sample to only those who had a DC loan for a particular reason. We then compare households who have poor health to those who are healthy. We also compare the loan amounts for each of these groups, by health status. Table 6 (top panel) indicates that those with poor health were much more likely to have loans for reasons related to education, health, and other professional services, conditional on having a loan. Since we have already shown that poor health results in having a higher probability of having a DC loan, this evidence indicates that those with poor health were most likely to use their loans for health related reasons. It is likely that this effect is muted by combining categories, and might prove to be much larger if health spending were calculated separately. Equally interesting is the overrepresentation of those in poor health in the other goods and services category. We interpret this as a spillover effect, in that households with a member in poor health used their retirement for general consumption. We do not conclude that households with members in poor health are engaging in “irresponsible” consumption, merely that the effects of poor health raise the likelihood that these households will use the proceeds for other goods and services.

Our investigation of the average loan amounts (bottom panel, Table 6) also provides additional evidence of the effects of health on the reasons for DC loans. Poor health is associated with larger average loans in the education, health and other professional services category and the other goods and services category. This implies that not only are those in poor health likely to state these reasons for having a loan, but they are more likely to borrow more (on average) than are those with good health. Interestingly, those in poor health, while less likely to borrow for a home purchase, borrow more on average than do those in good health.¹¹

¹⁰ Many other DC loans are related to purchases and renovations related to the borrower’s primary residence. These DC loans for primary residences are governed under slightly different rules, allowing, for instance, for slower repayment. The results are thus not directly comparable to our estimates here. We do not separately report our results for DC loans for cars, investments, and home improvements. These estimates confirm our overarching conclusions that DC loans for medical and other professional services are the primary medical debt form.

¹¹ In a separate analysis (not shown) we estimate two separate regression models: one for households that state that they took a loan for good and services and a second for households that stated that they took a loan for to pay for education, health, or other professional services. In neither of these models were we able to reject the null hypotheses that all the coefficients were statistically significantly different from zero (failed joint F-test). We interpret this as a statistical power problem due to the level of disaggregation and consequently, we do not report the results.

V. Conclusion

Our analysis of the relationship between health status, health insurance coverage, and loans from defined contribution retirement savings accounts, such as 401(k) accounts, indicates that poor health is a consistent and statistically significant predictor of both the likelihood of having a DC loan as well as the amount borrowed from a DC plan. We also find that poor health is a more important determinant of DC loans than homeownership and approximately equal in size to educational attainment. Third, the consistent relationship between poor health and DC loans persists after we control for health insurance coverage, even though health insurance coverage does not impact the likelihood of borrowing from a DC plan nor the amount borrowed. However, because nearly all participants who have a DC plan have an employer-sponsored health insurance plan there is reason to be wary of this finding.

Finally and unsurprisingly, when households in poor health take a DC loans they are most likely to use the loan proceeds to pay for health related expenditures. However, there are large spillover effects from borrowing while in poor health, and those with poor health often list current consumption as a primary reason for taking a DC loan. Not only are those with poor health more likely to take a loan for health and consumption related reasons, but average loan amounts also tend to be higher than loans taken by those in good health.

These findings lead to a few rather general policy conclusions. First, since households with family members in poor health have consumption related expenditures that cause them to borrow from their DC plan access to credit is critically important for these families. Consequently, policymakers should proceed cautiously when considering limits on DC loans since they seem to ease general financial constraints during medical needs. Second, households need more opportunities to save for the eventuality of a medical emergency. It may thus make sense to use tax incentives or other economic policy tools to make it easier for households in poor health to save more for retirement. Combining mechanisms for savings such as Health Savings Accounts with health insurance may allow workers more immediate access to saving and reduce the “spillover” effects caused by accessing retirement savings.

It is impossible, though, to refine these general conclusions further without additional data and research. It is, for instance, unclear if chronic illnesses, medical emergencies, or a combination of both are the primary drivers of more debt from DC plans. It is also worth exploring which features of health insurance coverage are more or less likely to reduce the need for households to borrow money. In a similar vein, particular policy proposals require more research to understand which consumption expenses and medical expenses are most likely to be paid for by DC loans. Answers to these research questions should facilitate policy design with respect to DC plan features and health insurance reform. Future research should also focus on examining the drawdown of wealth with panel data sets, however we are unaware of any of these data sets provide sufficient information about DC plan attributes.

Table 1
Loan Amounts for Households with Loans from Their DC Plans

Year	1989	1992	1995	1998	2001	2004	2007	Change 1989 to 2007
Share of households with DC plans	25.1	27.4	34.3	40.0	41.6	39.7	41.4	16.3
Share of households with DC plans who have the option to borrow from their DC plan	60.5	64.2	67.1	76.3	76.8	72.2	73.3	12.8
Share of households with DC plans and DC loans	4.2	8.0	10.9	13.4	10.8	11.7	10.9	6.7
Median loan amount	4,870	2,894	2,703	3,813	3,508	4,393	4,700	-3.4%
Average loan amount	9,227	5,492	5,399	6,680	7,736	8,711	6,558	-28.9%
Total DC loans (in billions, 2007 dollars)	\$4.2	\$5.9	\$10.8	\$21.4	\$23.4	\$30.1	\$26.2	523.8%

Source: In all instances, the demographic characteristics refer to the head of household. Inflation adjustments are done using the Bureau of Labor Statistics' CPI-U-RS. All dollar amounts are in 2007 dollars. Shares are in percent. Changes in shares are in percentage points. Changes in dollar amounts are percent. Only observations for households with a DC plan are included when we calculate the share of households with a DC loan. Only data for households with DC loans are considered for the median and mean loan amounts. Only households between the ages of 25 and 64 are included. Authors' calculations based on BOG (2009).

Table 2
Frequency of Reasons for Loans from DC Retirement Savings Accounts

Loan Reason	1998	2001	2004	2007	Pct. pt. change from 2001 to 2007
Frequency of loan reason					
Home purchase	24.8	24.6	11.7	3.3	-21.5
Home improvement	8.7	11.1	11.5	12.8	4.1
Vehicles	9.7	15.2	16.8	6.3	-3.4
Goods and services	39.6	36.4	44.4	62.8	23.2
Investments and other real estate	1.8	5.8	2.9	3.9	2.1
Education, medical and other professional services	15.5	6.9	12.8	10.9	-4.6
Average share of DC loans, by reason					
Home purchase	25.6	28.8	22.1	4.7	-20.9
Home improvement	11.7	23.6	13.8	12.7	1.0
Vehicles	16.2	6.6	15.8	5.5	-10.7
Goods and services	32.4	25.2	33.5	55.2	32.8
Investments and other real estate	1.6	3.6	5.1	7.4	5.8
Education, medical and other professional services	12.5	12.3	9.6	14.5	2.0

Source: In all instances, the demographic characteristics refer to the head of household. Authors' calculations based on BOG (2008). All figures are in percent. Similar information is not publicly available prior to 1998. Only data for households with loans from their DC plans are considered. Only households between the ages of 25 and 64 are included. The average share is the ratio of the total loans in the specified category to the total of all DC loans.

Table 3
Percentage of Households with and without DC Loans, by Household Characteristics

Years	1989-1995				1998-2007			
	Share among households with loans (1)	Share among households without loans (2)	Ratio of households with loans to those without loans (3)=(1)/(2)	Share of households with DC loan (4)	Share among households with loans (5)	Share among households without loans (6)	Ratio of households with loans to those without loans (7)=(5)/(6)	Share of households with DC loan (8)
Health Status								
Good	84.3	86.1	1.0	8.0	74.3	83.2	0.9	10.6
Poor Health								
-- 1 person	12.8	11.8	1.1	8.8	21.5	14.3	1.5	16.6
-- 2 people	2.8	2.2	1.3	10.3	4.2	2.5	1.7	18.0
Race/Ethnicity								
White	74.9	83.6	0.9	7.3	76.5	80.5	1.0	11.2
Black	14.4	8.5	1.7	13.0	14.2	10.8	1.3	14.9
Hispanic	6.4	4.5	1.4	11.1	6.3	5.7	1.1	12.9
Other	4.3	3.5	1.2	10.0	2.9	3	1.0	11.4
Health Insurance Coverage								
Covered	98.9	99.1	1.0	8.1	98.2	98.2	1.0	11.7
Uncovered	1.1	0.9	1.2	9.9	1.8	1.8	1.0	11.7
Saver								
No	32.7	34.7	0.9	7.7	44.9	31.2	1.4	16.0
Yes	67.4	65.3	1.0	8.3	67.4	65.3	1.0	9.6
Planning Horizon								
Months	17.9	12.6	1.4	11.1	16.4	12.2	1.3	15.2
Next year	14.0	12.0	1.2	9.3	15.3	9.4	1.6	17.7
Few years	19.8	22.3	0.9	7.3	25.5	25.7	1.0	11.6
5-10 years	27.9	31.2	0.9	7.3	27.2	30.6	0.9	10.5
>10 years	20.4	21.9	0.9	7.6	15.6	22.2	0.7	8.5

Notes: Authors' calculations based on BOG (2008). All figures are in percent. Columns 1, 2, 5, and 6 show the distribution of household characteristics, conditional on having a DC plan and a DC loan. Columns 4 and 8 show the probability of having a DC loan, conditional on a particular characteristic. The demographic characteristics refer to the head of household. Only households between the ages of 25 and 64 are included.

Table 4
Regression Estimates of Probability of DC Loans among Account Holders, Marginal Effects

Explanatory variable	Baseline model		Extended model with year dummies		Restricted sample without loans for first residence, with year dummies	
	Coefficients (Std. error)	Marginal effects	Coefficients (Std. error)	Marginal effects	Coefficients (Std. error)	Marginal effects
Poor health	0.209*** (0.063)	0.040	0.191*** (0.063)	0.037	0.220*** (0.079)	0.040
Health insurance	-0.043 (0.205)	-0.008	-0.003 (0.205)	-0.001	0.039 (0.225)	0.006
Black	0.145* (0.081)	0.027	0.134 (0.082)	0.025	0.051 (0.109)	0.009
Hispanic	0.047 (0.114)	0.009	0.052 (0.114)	0.009	-0.0001 (0.134)	0.0001
Other race	0.046 (0.165)	0.009	0.038 (0.168)	0.007	-0.153 (0.208)	-0.023
Single women	-0.139 (0.099)	-0.023	-0.120 (0.100)	-0.020	-0.087 (0.119)	-0.014
Married	-0.133 (0.085)	-0.024	-0.114 (0.085)	-0.020	-0.085 (0.105)	-0.014
Age	0.089*** (0.023)	0.016	0.089*** (0.024)	0.015	0.087*** (0.032)	0.014
Age ²	-0.001*** (0.0003)	-0.0002	-0.001*** (0.0003)	-0.0002	-0.001*** (0.0004)	-0.0002
No high school/GED	0.019 (0.145)	0.004	0.018 (0.145)	0.004	0.033 (0.168)	0.006
High school/GED	0.189*** (0.065)	0.035	0.189*** (0.065)	0.034	0.196*** (0.075)	0.034
Some college	0.175*** (0.064)	0.033	0.177*** (0.065)	0.033	0.213** (0.085)	0.038
Employed	0.042 (0.067)	0.007	0.044 (0.068)	0.007	-0.006 (0.081)	-0.001
Unemployed	-0.337 (0.234)	-0.047	-0.331 (0.233)	-0.045	-0.614* (0.315)	-0.067
Real income (natural log)	-0.061 (0.036)	0.011	0.060 (0.036)	0.010	0.024 (0.048)	0.004
Homeownership	0.115* (0.070)	0.019	0.113 (0.069)	0.019	0.107 (0.092)	0.017
Saver	-0.156*** (0.053)	-0.028	-0.154*** (0.054)	-0.027	-0.212*** (0.065)	-0.037
Planning horizon	-0.078*** (0.019)	-0.014	-0.079*** (0.020)	-0.014	-0.094*** (0.025)	-0.016
1992			0.332** (0.157)	0.067		
1995			0.473*** (0.153)	0.101		
1998			0.599*** (0.151)	0.132		
2001			0.461*** (0.154)	0.096	-0.137 (0.089)	-0.021

2004		0.519***	0.110	0.010	0.002
		(0.144)		(0.092)	
2007		0.465***	0.096	-0.010	-0.002
		(0.155)		(0.086)	
Constant		-4.025***		-3.127***	
		(0.639)		(0.876)	
N	7925	7925		5311	
F-statistic	5.54	4.79		4.25	
p-value	0.000	0.000		0.000	

Notes: Results are based on probit regressions. * indicates significance at 10%-level, ** indicates significance at 5%-level, and *** indicates significance at 1%-level. The main sample comprises households with DC accounts between the ages of 25 and 64. The restricted sample excludes households with loans taken out for the purchase of a primary residence and years before 1998. Marginal effects show the effect of an incremental change in continuous variables and that of a category switch for dummy variables.

Table 5 Estimation Results for Determinants of DC Loan Amounts

Explanatory variable	Baseline model	Extended model, with year dummies	Restricted sample, without loans for first residence and with year dummies
Poor health	3164.67*** (1153.86)	2798.29** (1122.92)	2954.28** (1345.68)
Health insurance	290.78 (3363.97)	915.69 (3365.99)	2202.65 (3650.16)
Black	1207.48 (1447.87)	992.93 (1445.91)	-441.79 (1758.24)
Hispanic	700.56 (1854.03)	754.48 (1848.20)	75.19 (2261.05)
Other race	339.78 (2757.32)	203.88 (2800.89)	-2286.63 (3669.21)
Married	-583.91 (1435.83)	-238.46 (1438.71)	208.02 (1725.66)
Single women	-2768.21 (1771.39)	-2424.63 (1756.46)	-1889.83 (2133.89)
Age	1875.25*** (501.02)	1860.66*** (493.99)	1837.28*** (655.05)
Age ²	-20.26*** (5.56)	-20.13*** (5.48)	-19.30*** (7.12)
Neither high school/GED	-1735.42 (2314.34)	-1686.68 (2292.35)	-1358.38 (2776.48)
High school/GED	1500.10 (1254.91)	1468.11 (1256.43)	1608.15 (1336.16)
Some college	1385.03 (1143.43)	1294.48 (1138.59)	2136.24 (1579.01)
Other consumer debt to income	-904.13 (1472.99)	-330.03 (1121.28)	-110.78 (967.74)
Home equity (\$1,000s)	-82.87** (38.38)	-89.90** (39.44)	-136.30*** (51.98)
Saver	-1991.74** (910.80)	-1900.64** (912.10)	-2552.11* (1326.53)
Planning horizon	-1236.74*** (407.11)	-1229.96*** (408.31)	-1577.57*** (511.93)
1992		4494.69* (2603.77)	
1995		6943.25** (2937.09)	
1998		9501.38*** (3127.39)	
2001		7602.55*** (2778.02)	-1900.18 (1638.16)
2004		9011.38*** (2905.52)	908.60 (1719.94)
2007		7650.65*** (2785.57)	450.17 (1496.26)
Constant	18042.15 (3624.94)	17950.94*** (3634.60)	17895.08*** (4340.88)

N	7948	7948	5312
F-statistic	3.88	3.29	2.97
P-value	0.000	0.002	0.055

Notes: Results are based on Heckman sample selection regressions – selection equation not shown. See Table 4 for probit results for factors influencing the likelihood of a DC loan. These constitute the selection models for the loan determination models presented here. * indicates significance at 10%-level, ** indicates significance at 5%-level, and *** indicates significance at 1%-level. The main sample comprises households with DC accounts between the ages of 25 and 64. The restricted sample excludes households with loans taken out for the purchase of a primary residence and observations before 1998.

Table 6
Reasons for DC Loans by Health Status

Loan Reason	(1) Poor Health	(2) Good Health	(3) Ratio (1)/(2)
Frequency of loan reason			
Home purchase	15.5	16.4	.95
Home improvement	6.0	12.7	.47
Vehicles	11.2	11.7	.96
Goods and services	50.6	44.4	1.14
Investments and other real estate	3.2	3.7	.86
Education, medical and other professional services	13.5	11.2	1.21
Loan Amount (avg.)			
Home purchase	\$10,481	\$7,125	1.47
Home improvement	\$4,981	\$9,316	.53
Vehicles	\$2,677	\$6,638	.40
Goods and services	\$5,705	\$5,098	1.12
Investments and other real estate	\$3,120	\$10,129	.31
Education, medical and other professional services	\$8,357	\$6,078	1.37

Source: In all instances, the poor health refers to any member of the household being classified as having “poor” or “fair” health. Authors’ calculations based on BOG (2008). All figures are in percent. Similar information is not publicly available prior to 1998. Only data for households with loans from their DC plans are considered. Only households between the ages of 25 and 64 are included.

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