The Health Consequences of Debt:
Evidence from the Panel Study of Income Dynamics

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Debt is a ubiquitous feature of American life. Since World War II, consumer credit markets in the U.S. have become increasingly formalized and extensive. These trends started first with the major expansion of home loans and mortgages and the growth in installment loans for major purchases from retailers throughout mid-century and continue today with the explosive growth in credit cards and student loans since at least the 1980s (Katona 1964; Manning 2000) Today, nearly three-quarters of American families are in debt of some kind (Aizcorbe, Kennickell & Moore 2003).

There is reason to believe that debt is not merely a financial issue, but one with serious consequences for the well-being of individuals and families. Debt may be acquired in a time of a crisis, or may just reflect more general financial strain. Debt, whatever its origins, may be an independent source of financial strain. As such, debt may produce both anxiety and stress, with serious mental and physical health consequences (Adler et al 1994). The purpose of this study is to explore the extent to which debt is associated with poorer self-rated health than might otherwise be expected. Adequate frameworks for understanding debt and the necessary data for adjudicating between proposed frameworks are hard to come by and, as a result, any study of the potential consequences of debt, like the one presented here, is necessarily suggestive and tentative at best.

Background: Recent Trends in Debt

As late as World War II, most Americans were debt-free (Katona 1964), at least as far as formal loans and contractual credit agreements with banks and retailers are concerned. Estimates from the early 1960s reveal that about two-thirds of all American families had debt of some kind: one-half with installment debt, one-third with mortgage debt, and one-fourth with short-term non-installment debt (Katona 1964). The incidence of debt varied with both family income and

age. Installment debt, which financed the purchase of such items as automobiles, household appliances, and furniture, was found largely among middle- and upper-middle-income families with young heads of household. This assertion may understate the extent to which others, particularly poor families, were involved in informal loan and credit arrangements.

Since the early 1960s, increases in the number of indebted individuals as well as the average amount of debt held, controlling for inflation, have occurred at the same time as the forms in which these debts are held have changed. Here I will review the most current statistics pertaining to the incidence and value of personal debt among American families. Unless otherwise noted, all values are from Aizcorbe, Kennickell & Moore (2003) whose estimates are derived from the 2001 Survey of Consumer Finances.

Mortgages make home-ownership possible for a great number of American families. Nearly 45% of American families have loans on their primary residence, including both primary and secondary mortgages (refinancing). In general, the incidence of home-secured debt increases with income: only 13.8% of families in the bottom decile of the income distribution hold mortgages while more than 74% of families in the top two deciles of the income distribution hold mortgages. Further, the median value of mortgage debt increases dramatically with income, from $28,000 for families in the bottom decile to $134,000 for families in the top decile.[1] Of course, this range in prices reflects not a greater need on the part of high income families, but rather their greater ability to secure larger loans (and thus purchase properties of greater value).

Installment loans continue to be an important form of debt for American families, though presumably a larger portion of these loans are for automobiles than anything else. More than

[1] These values represent loans secured against primary residences. Loans secured against other residential property are far less common—this type of debt is held by less than 5% of American families—and again are found primarily among high income families.

45% of American families owe money on installments loans. Unlike mortgages, there is not a strong relationship between family income and the incidence of installment loans, though a larger portion of families closer to the middle of the income distribution have debt in this form than families at the extreme ends of the distribution. This probably reflects the difficulty low-income families have in obtaining installment loans and a lesser need among high-income families for credit-based financing of major purchases. The relationship between the median value of this type of debt and income is more consistent. While the median value of installment debt for families in the bottom decile of the income distribution was $4,600, the median value for families at the top of the income distribution was $13,400. A more striking association is that between age of the head of household and installment loans. Almost 63% of families with a head of household under the age of thirty-five have debt from installment loans. At the other end of the age distribution, only 9.5% of families with a head of household over the age of 75 have debt from installment loans. Notably, a similar relationship is not found between age and the current value of installment loans.

The third major category of debt is that accrued through credit cards. Credit cards, which date back to the decade following World War II, are now widely used by Americans (Ritzer 1995). In 1970, just over half of American families had at least one credit card, but by 1998, almost three-quarters of American families did (Durkin 2000). Further, in 1970 only 22% of American families carried a balance on any credit card, but in 1998, 42% of families carried a balance. Trends in the association between family income and carrying a balance on bank-type credit cards show an interesting pattern. In 1970, the portions of families at the top and bottom of the income distribution with balances on credit cards were around 30% for both groups. Larger portions with credit card balances were found in each of the middle three income

quintiles, as high as 47% of families in the middle income quintile. By 1998, credit card balances were more common overall and, in general, the portion of families in the bottom four income quintiles with balances were roughly equal, around 59%, while only 45% of families in the top income quintile carried credit card balances. Information pertaining to trends in the association between age and credit card use and debt over time is not available. In 2001, there was some evidence that larger portions of household with heads of house under the age of 54 had credit card debt than among families with older heads of household (Aizcorbe, Kennickell & Moore 2003).

Understanding Debt

Elementary economic models provide one framework for understanding why individuals incur debt. At the most basic level, individuals must borrow, or go into debt, when their current consumption needs or wants are greater than the financial resources currently available. Important distinctions must be made regarding the reasons financial resources are unavailable and the nature of the consumption being financed.

Financial resources may be unavailable in the present because the individual has not yet acquired such resources and, in this case, debt-financed consumption may be understood as consumption smoothing. In other words, individuals borrow against future income to pay for current consumption, thus equalizing consumption over the life course. Optimal levels of debt will depend on the cost of borrowing (interest rate) and the cost of delayed consumption (discount rate). While interest rates are largely exogenously determined, the relative utility from consumption now as compared to consumption later is likely to vary across individuals. Further complications of this general model of consumption smoothing that may be important relate to how individuals estimate future income. Issues of risk and uncertainty may be particularly

salient here. Individuals may expect growth in income over the working ages; however, individuals will differ in the actual and anticipated levels of future income as well as the rate of growth in income.

Debt may be part of a larger financial investment scheme. In some cases, individuals may be liquidity constrained: necessary resources to finance current consumption have been acquired by the current period, but these resources are, for one reason or another, not available. In other words, an individual may have financial assets that are "tied up" in investment instruments that are not easily converted to money (e.g., stocks and bonds). Alternatively, the rate of return on current investments may exceed the costs of borrowing. In either case, we assume that those with larger holdings of illiquid financial assets will incur larger amounts of debt. It is important to note that the current net worth of individuals is still positive, which is not necessarily implied in the consumption-smoothing framework.

As suggested earlier, it may be fruitful to differentiate between different types of debt-financed consumption or, more generally, expenditures. One distinction that needs to be made is between debt-financed consumption as opposed to debt-financed investment. The most obvious form of debt-financed investment is in human capital, specifically education.[2] An individual's willingness to finance investments through borrowing will depend on the cost of borrowing (interest rate) and the rate of expected returns to the investment. Larger anticipated returns are expected to lead to a greater willingness to borrow and to borrow larger amounts, holding interest rates constant.

[2] Note that investment in education includes not only students loans which finance the direct costs of education, of which trends in the prevalence of which will not be discussed, as well as costs of living which must be covered through some kind of borrowing (including intra-familial transfers) since few students are able to earn much income. The use of credit cards to finance consumption during college has received a great deal of attention in recent years (Manning 2003).

A final distinction that needs to be made is between planned and unplanned borrowing. The reasons for borrowing outlined above imply, to one extent or another, rational economic actors consciously enacting financial strategies in order to maximize lifetime utility. While this characterization may be accurate for some debtors, it is probably not universally appropriate. Individuals may find it necessary to borrow to finance large unplanned expenditures, such as life-saving medical care, or because of large unplanned changes in current income. Debt under these conditions may have very different implications than the rational financial planning described above.

Scholars who have been more sociological in their theoretical orientations largely question the implicit rationality of consumers implied in the economic frameworks. Some s have pointed to the intensification of consumer culture that has pervaded daily life in recent years as important for understanding the growth in indebtedness (Ritzer 1995; Schor 1998). More important for the present analysis are those who have looked at changes in the distribution of income and resources in recent decades to explain the rapid growth in debt. Though the impact of changes in the financial industry in recent decades on growth in credit card debt are clearly important, it is argued that broader societal trends, including divorce, employment disruptions, declining earnings, escalating college costs, and soaring home mortgages, are all responsible for the growth in indebtedness of families (Manning 2000). Similarly, others claim that both changes in the financial industry and the growing economic inequality can explain the rise consumer debt (Draut and Silva 2003). These authors link broader trends in job displacement and underemployment along with rising health care and housing costs to explain the growth in debt. Interested in the rise if personal bankruptcy—the most precarious of financial situations—Sullivan, Warren, and Westbrook (2000) surveyed 2,400 individuals filing for bankruptcy. They

queried respondents about the events leading to bankruptcy and, despite several limitations of their data, these authors paint a picture of an increasingly vulnerable middle class, for whom shocks in income and spending due to illness and accidents, job loss, sky-rocketing housing costs and family disruptions, can result in financial ruin.

Several demographic, economic, and psychological conditions appear to be associated with the accumulation of debt by families and individuals, including changes over time. These findings generally conform to predictions that would derive from the theoretical outline described above. Evidence from the U.S. reveals that age, household size, income, expectations about future income, receipt of public aid, and time preferences are all associated with changes over time in the odds of incurring debt and the level of debt incurred (Godwin 1998). In Britain, age, number of children, income, amount of personal savings, certain budgeting strategies, and attitudes toward credit and consumption are all significant predictors of indebtedness (Livingstone and Lunt 1992). Both economic and psychological factors, including time preferences and self-control, are important predictors of debt in the Netherlands (Webley and Nyhus 2001).

Debt and Health

The major issue in attempting to understand any potential non-financial consequences of debt is the range of potential conditions under which debt is acquired. From the perspective of the more general economic frameworks, in which debt is but a component of a long-term financial strategy, one would expect any negative consequences of debt to be minimal. Though, even in this case, one could imagine some residual anxiety—unanticipated events could disrupt the best laid plans and attentiveness to this possibility could be a source of stress for some individuals. In cases in which the need to incur debt is unanticipated and outside of any long-

term financial planning, such as illnesses, accidents, or other unplanned drops in income or spikes in consumption, distinguishing the impact of these conditions on any number of outcomes as opposed to the independent contribution of the debt itself will be difficult at best. This is especially true when some or all of the debt in question is medically-related and estimates suggest that this is very often the case, particularly when debt results in bankruptcy (Jacoby 2002).

Very few scholars have attempted to examine any potential relationship between debt and health outcomes. One important exception is the work of Drentea and Lavrakas (2000). They look specifically at credit card debt, which they (rightfully) argue is distinct from "normative debt," such as in the form of home mortgages. These authors identify three potentials pathways through which credit card debt may be associated with poor health: 1) indebtedness may reflect financial distress, both short- and long-term; 2) indebted individuals may have less resources to spend on "quality" goods, particularly health care, as they cut corners in an attempt to retain financial stability; 3) the stress of owning money may contribute to overall elevated levels of stress, particularly when debt is outstanding and lending companies have started the process of collection. Based on data from a representative sample of adults in Ohio, they find that both debt and the stress regarding debt are associated with health. It should be noted that their findings suggested that at least part of this relationship may be explained by health behaviors and risk.

Other research suggests that the role of health behaviors in the relationship between debt and health may be important. One study which sought to understand the psychological determinants of indebtedness in the Netherlands looked at measures of obesity, smoking, and drinking, which were believed to measure some type of "self-control" (Webley and Nyhus 2001). All were significantly associated with indebtedness, though the authors of this study

conceded that these behaviors could in fact be responses to indebtedness instead of expressions of some underlying psychological disposition to incur debt. Unfortunately, the necessary data to assess the exact nature of the association between these health behaviors and indebtedness are unavailable. In terms of understanding any association between debt and health outcomes, it therefore remains unclear if the relationship is largely spurious or in fact mediated by health behaviors.

In Britain, Nettleton and Burrows have looked at the association between mortgage debt and health (Nettleton and Burrows 1998). They find that the onset of indebtedness is associated with poor self-reported health, though they are cautious about making strong causal claims. Their caution results in part from their evidence which suggests that indebtedness and the associated stress is also strongly associated with conditions under which families find themselves in insecure financial positions such as changes in income. As they state,

> "Indeed… mortgage indebtedness is rarely an isolated life event, but an experience which results from and impacts upon other biographical changes" (Nettleton and Burrows 1998).

This study highlights the need to consider the conditions in which debt is incurred when studying any associated outcomes.

This study and others pertaining to the potential health consequences of debt strongly implicate the role of psychosocial stress that is associated with indebtedness in promoting poor health outcomes (Jacoby 2002). This is not inconsistent with certain prevailing theories pertaining to the contribution of psychosocial variables to socioeconomic differentials in health (Adler, Boyce, Chesney, Cohen, Folkman, Kahn, and Syme 1994; Anderson and Armstead 1995). Further, evidence supporting the relationship between debt and stress or anxiety supports these propositions (Drentea 2000; French 1981; Keith 1993; Reading and Reynolds 2001).

Though this analysis suffers from serious limitations identified in earlier work, I am able to use longitudinal data in order to overcome certain other limitations. Specially, I am able to control for both health status in an earlier period than the period in which the outcome is measured. Further, I am able to control for other important biographical disruptions which may be important including changes in marital status, extended illnesses, and retirement. However, I am unable to control for health behaviors, which may be important. Further, this analysis provides no insight into the extent to which debt results in an inability to acquire certain health-promoting goods and services which may be important. Therefore, I am left silent on the extent to which this is important, as opposed to alternative pathways, including the role of stress.

Data and Methods

Data for this analysis come from the Panel Study of Income Dynamics (PSID). PSID data collection began in 1968 with a sample of 5,000 families and has occurred in every year since. Successful efforts to track the original sample, as well as the families growing out of these original families (i.e., as children have grown and formed their own families), have led to the inclusion of more than 7,000 families by the year 2001. Extensive information is collected about both families and the individuals within families. In the 1984 and 1989 waves of data collection respondents were asked about household debt holdings, therefore this analysis relies primarily on data from these waves.

For a number of reasons, I have restricted my sample in important ways. For each household, I look only at the individual designated as head of household. This restriction makes sense to the extent that the heads of household, as designated by PSID, are (among) the primary financial decision-makers within the household, both aware of and potentially affected by the financial health of the family. The restriction of the analysis to heads of household has prompted

another important restriction of the sample. By default, PSID designates the male as the head of any two-parent household, which means that a female is only designated as head of household when she is not currently married. In order to avoid the need to differentiate the potential health consequences associated with being the head of a female-headed household from the health states associated with being female, I have restricted my sample to only those households with a male head of household. Though this restriction does simplify matters, it means that the generalizability of these results to women is limited. Finally, known racial disparities in health suggest the need to control for race, if not model separately according to race, in analyses of health relationships (Williams and Collins 1995). Since the sample contains only small portions of non-white respondents, I have instead restricted the sample to non-Hispanic whites. Again, though this simplified analysis considerably, the generalizability of results may be called into question.

It seemed plausible that the health and financial situations of individuals that are not in the labor force would be different from those currently in the labor force. To simplify the analysis and avoid confounding effects of non-labor force participation—particularly among students and permanently disabled individuals—I restricted the sample to only those households in which the head was in the labor force in 1984. Further, though the sample includes those who had retired by 1989, anyone not in the labor force for other reasons by 1989 has been removed. Note that being in the labor force includes both those currently employed and those currently out of work but looking for work.

Other restrictions to the sample were made for more practical reasons. I was only able to include those respondents who were in the sample in both the 1984 and 1989 waves of data collection. In many cases, the respondent to the survey was the head of household, but this was

not always the case. I restricted the sample to only include those households in which the head was the actual respondent. I excluded cases with missing values on any of the variables included (note important exceptions below). The biggest source of missing data was from questions related to debt. It may not be fair to assume that these important variables were missing completely at random, and as a result, some bias may have been introduced by simple listwise deletion (Allison 2001).

In sum, the sample used in the analysis totals 1,418 respondents. These respondents are white males who were in the labor force in 1984 and were either still in the labor force or retired by 1989.

Dependent Variable

[Table 1 about here]

Survey respondents were asked to report their general health status. Health could be classified as "excellent," "very good," "good," "fair," or "poor." There is some debate as to the general reliability of self-reported health measures. However, at least among the elderly, general self-perceptions of health are powerful predictors of morbidity and mortality (Idler and Kasl 1991). Table 1 shows the distribution of self-reported health in the sample. Since few respondents were in the two poorest health categories, these two categories were collapsed into one. The analysis focuses on self-reported health in 1989 as the primary outcome variable.

Independent Variables

Summary statistics for all independent variables are found in Table 1. The variables of central interest to this analysis are related to debt holdings of the household. Respondents were asked whether the family (or any member of the family) had any debts (e.g. from medical bills, credit cards, student loans) and the total value of this debt. Other important types of debt, such

as mortgage or business debt, were directly and indirectly considered in other measures that are not included in this analysis. These other forms of debt are very different in nature from forms of debt considered here. In particular, they may be considered forms of investments as much as liabilities. Important work in the future might consider whether the health consequences of other forms of debt are similar to the form considered here, but this analysis only considers the category of debt described above—credit card debt, medical bills, student loans and the like. Hereafter, I will simply refer to this as "debt."

Variables designed to elicit different dimensions of indebtedness were considered in the analysis. One type of measure is a simple dichotomous variable of whether the respondent reported that the household held debt or not. Table 1 reveals that the proportion of the sample reporting debt declined slightly over the period from 57% in 1984 to 55% in 1989. I also look at debt as a ratio of total family income (described below). Instead of treating this as a continuous variable, I divided the indebted portion of the sample in both years into those for which total debt was equal to or less than 10% of total income and those for which it was equal to more than 10% of total income. The proportion of the sample for which debt represented more than 10% of total income grew from 15% in 1984 to 18% of the sample in 1989. Looking at the associations between debt and health cross-sectionally may be inappropriate. For that reason, I look at debt measures from the 1984 wave of data collection in relation to health in 1989. Roughly equal proportions, 15% and 17%, held debt in only one year, 1984 or 1989, respectively, while a full 40% of the sample held debt in both years.

There are many other important sources of variation in health status that are controlled for in my analysis. These include income, education, age, and marital status. Values for total family income in 1989 were generated from the PSID based on reported or imputed taxable

income of the head and wife, total transfers of head and wife, taxable prorated income of others in the household, and total prorated transfers of others in the household. In the final analysis, total family income is measured in tens of thousands of dollars. In this analysis, education is treated as a series of dummy variables reflecting educational attainment level: less than high school, high school diploma only, some college, or college degree or more. The last category serves as the reference. Age in 1989 was treated as a series of 10-year age intervals with over 60 as an open-ended interval. Note that the 30-39 year age category is the reference. No respondents in the sample were under the age of 18. Marital status in 1989 is also considered with married as the reference category.

A number of additional controls were included in the analysis with the intention of reducing possible biases due to selection. These controls might be associated with both health status and the incidence of debt. Two of these types of measures pertain directly to health status. First, I look at health status in 1984. Table 1 shows that the distribution of self-reported health status in 1984 is not much different from the distribution in 1989, though it is slightly concentrated in the better heath categories in the earlier year (as expected).

Because debt is often acquired as a result of serious illness, I include a measure that is designed to highlight individuals who have missed an excessive period of work due to their own illness. Specifically, in all years, respondents are asked to report the number of hours of work missed due to their own illness. For the years 1984 to 1988 (1985 to 1989 data collection waves), I code as one all respondents who reported more than one month of missed work (160 hours) due to illness in any year. This measure is not available for all respondents in all years, but respondents are kept in the sample if this measure is available for at least one year. This could potentially result in an underestimate of individuals who have missed extensive periods of

work due to illness. Note that this measure is not constructed to distinguish between those missing *consecutive* days of work and those missing work more sporadically in a given year. The inclusion of this variable is particularly important in this setting where days of missed work could also be associated with increased indebtedness—either to cover medical bills during the period of illness or to pay for other consumption during the period of lost work wages.

The last two controls consider retirement and changes in marital status. As stated earlier, only those respondents who were in the workforce in 1984 were considered in the analysis. I kept in the sample those that retired by 1989, however, but attempt to control for this change in work status with a simple dichotomous variable. Only about 8% of the final sample retired at any point between 1984 and 1989.[3] Finally, I consider whether the head of household experienced a change in marital status over the previous three years. This includes about 17% of the sample. I do not distinguish between those who entered marriage and those who exited marriage.

Analytic Strategy

It is clear that ordinary least squares regression is not appropriate when the dependent variable is self-reported health status as measured here. Further, preliminary analysis suggested that cumulative logit models were also inappropriate. In particular, the assumption of proportional odds was not supported. Instead, the most valid method for assessing health status in this context is multinomial logit regression. The reference category of the dependent variable is "excellent" health. Both the estimated coefficients and the adjusted odds ratios are reported.

Results and Discussion

[TABLE 2 ABOUT HERE]

[3] Individuals who retired in one year and subsequently returned to the labor force are still marked as retired.

Table 2 shows the results from the first multinomial logit model of health status. Here, the included measure of debt is the simple dichotomous variable of being in debt in 1984. Even with controls, it appears that being in debt is associated with an increased likelihood of being in each of the poor health categories. Further, it seems that the likelihood of being in each of the poor health categories increases with each poorer health category, with the likelihood of being in the poor/fair health associated with being in debt as the highest. Though self-reported health status in 1984 appears to be the most important predictor of health status in 1989, the inclusion of this control does preclude the association between health status and indebtedness.

[TABLE 3 ABOUT HERE]

Table 3 shows the results from the multinomial model logit model of self-reported health status in 1989, but where the included measure of debt is slightly more detailed. In order to assess the extent to which different *levels* of debt have more pronounced associations with health, this model considers the ratio of debt to total family income. Here, two dummy variables, indicating respondents with a value of debt under 10% of total family income and a value of debt over 10% of total family income, are included with a reference category of respondents with no debt. The measures pertain to debt in 1989. As with the simpler measure of debt, we see that debt is associated with an increased likelihood of being in each of the poorer health categories, regardless of the level of debt. Further, it seems that a higher ratio of debt to income (more than 10%) is associated with an increased likelihood of being in good or fair/poor health as compared to the association between lower levels of debt and the likelihood of being in these health categories. These relationships exist in the presence of several controls. Again, it appears that self-reported health status in 1984 is the most important predictor of health status in 1989, but

even with this control, the relationship between debt and self-reported health status is strong and statistically significant.

In order to assess the extent to which an effect of debt may be lagged, I looked at similar regressions that consider these measures of debt for 1984. This also has the advantage of potentially controlling for other selection effects that might not be fully captured in my control measures. The results (not shown) for these regressions were very similar in all respects to the result for debt measures in 1984.

[TABLE 4 ABOUT HERE]

Because short-term spells of indebtedness may be very different in nature from long-term indebtedness (Webley and Nyhus 2001), I wanted to consider the independent contribution of having debt in only one of the two years considered as compared to being in debt in both years. Table 4 shows the output from this multinomial logit model. It seems that having debt in only one of the two survey years is not as important as being indebted in both years. Though the coefficients associated with being indebted in each year only are in the expected direction, they are not statistically significant. The coefficients associated with being indebted in both years are strong, positive, and statistically significant, suggested that remaining in debt over a five year period is strongly associated with being poorer health. This relationship potentially suggests the importance of debt as a long-term financial state with serious consequences. Perhaps the extended period of indebtedness is reflective of a sustained period of stress—whether resulting from the state of indebtedness or the frustration associated with not having enough money to cover expenses.

Conclusion

Within the body of research on socioeconomic status and health, there is growing concern that conventional measures of socioeconomic status, including education and income, fail to capture important aspects of socioeconomic status (Hummer, Rogers, and Eberstein 1998; Smith and Kington 1997; Williams 1990). It appears that the emergent call for more sophisticated and inclusive measures of SES in the study of health differentials is well-founded. Mounting evidence suggests that alternative measures such as income changes over time, wealth, and debt, are not only important measures of financial well-being, but are related to health status in important ways. The results presented here, though not without limitations, are similarly provocative and highlight the need for even more detailed work in this area.

My analysis provides limited evidence of three important associations between health and debt. First, there is a basic association between having debt and being in poorer health. Second, there is evidence that the amount of debt relative to income also matters. Finally, my results suggest that long-term indebtedness may be more important than short-term indebtedness. These results persist in the presence of important controls, including those related to the conditions under which debt may be incurred.

There are several shortcomings in the analysis presented here that could be addressed in future work. As discussed at length, I restricted my sample considerably thus compromising the generalizability of these findings to other populations, most notably women and non-white racial and ethnic groups. In addition, I only considered a very limited measure of debt. There is a need for more detailed data on all types of debt, only some of which can be dealt with using available PSID data. Likewise, more variables that get at the conditions in which debt was incurred would present a clearer picture of the health consequences of debt. This would include more refined measures of the trajectories of debt over time.

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Table 1: Summary Statistics for Sample of White Male Respondents (N=1,418)				
	Mean	**St. Dev.**	**Min**	**Max**
Dependent Variable				
Self-Reported Health Status in 1989				
Excellent	0.28	--	0	1
Very good	0.39	--	0	1
Good	0.26	--	0	1
Fair/poor	0.07	--	0	1
Independent Variables				
Debt Status				
In debt in 1984	0.57	--	0	1
No debt in 1984	0.43	--	0	1
Debt 10% or less than income in 1984	0.42	--	0	1
Debt more than 10% of income in 1984	0.15	--	0	1
In debt in 1989	0.55	--	0	1
No debt in 1989	0.45	--	0	1
Debt 10% or less than income in 1989	0.37	--	0	1
Debt more than 10% of income in 1989	0.18	--	0	1
Debt in 1984 only	0.17	--	0	1
Debt in 1989 only	0.15	--	0	1
Debt in both 1984 and 1989	0.40	--	0	1
Income (tens of thousands of dollars)	4.41	3.21	0.00	64.14
Age				
Under 30	0.08	--	0	1
30-39	0.35	--	0	1
40-49	0.29	--	0	1
50-59	0.15	--	0	1
Over 60	0.13	--	0	1
Education				
No high school diploma	0.14	--	0	1
High school diploma only	0.31	--	0	1
Some college	0.21	--	0	1
College degree or more	0.34	--	0	1
Marital Status in 1989				
Single	0.06	--	0	1
Divorce	0.09	--	0	1
Widowed	0.01	--	0	1
Married	0.84	--	0	1
Missed work due to illness	0.22	--	0	1
Retired	0.08	--	0	1
Change in marital status	0.17	--	0	1
Self-Reported Health status in 1984				
Excellent	0.35	--	0	1
Very good	0.39	--	0	1
Good	0.21	--	0	1
Fair/poor	0.05	--	0	1

Source : Panel Study of Income Dynamics, 1984-1989

Table 2: Multinomial Logit Model of Self-Reported Health Status in 1989 (N=1,418)

	Health Status[a]					
	Very Good		**Good**		**Fair/Poor**	
	Estimate (SE)	Odds Ratio	Estimate (SE)	Odds Ratio	Estimate (SE)	Odds Ratio
In debt (1= Yes)	0.435	1.545**	0.486	1.625**	0.704	2.022*
	(0.148)		(0.175)		(0.276)	
Income (tens of thousands of dollars)	0.002	1.002	-0.033	0.967	-0.079	0.924
	(0.011)		(0.023)		(0.051)	
Age (reference= 30-39)						
Under 30	0.212	1.236	0.070	1.073	-0.501	0.606
	(0.282)		(0.344)		(0.712)	
40-49	-0.039	0.962	0.140	1.150	0.149	1.161
	(0.174)		(0.212)		(0.376)	
50-59	0.018	1.018	0.609	1.839*	1.238	3.450**
	(0.241)		(0.270)		(0.398)	
Over 60	0.152	1.164	0.622	1.862	1.003	2.727*
	(0.317)		(0.347)		(0.494)	
Education (reference= college or more)						
No high school diploma	0.544	1.723*	0.708	2.03*	1.026	2.791*
	(0.271)		(0.306)		(0.440)	
High schoold diploma only	0.344	1.410	0.708	2.03**	0.527	1.694
	(0.188)		(0.224)		(0.383)	
Some college	0.235	1.265	0.349	1.417	0.067	1.070
	(0.190)		(0.235)		(0.425)	
Marital Status (reference = married)						
Single	-0.065	0.937	-0.580	0.560	0.410	1.506
	(0.301)		(0.400)		(0.569)	
Divorced	0.164	1.178	0.170	1.185	0.460	1.584
	(0.296)		(0.330)		(0.461)	
Widowed	0.002	1.002	-0.613	0.542	0.451	1.570
	(0.867)		(0.953)		(1.076)	
Missed work due to illness (1 = Yes)	0.260	1.297	0.301	1.351	0.951	2.587**
	(0.193)		(0.216)		(0.292)	
Retired (1=Yes)	0.613	1.846	0.837	2.308*	0.980	2.665
	(0.401)		(0.419)		(0.530)	
Change in marital status (1 = Yes)	0.110	1.116	0.285	1.330	0.508	1.662
	(0.217)		(0.254)		(0.388)	
Health Status in 1984						
Very good	1.617	5.04**	2.055	7.808**	1.078	2.939*
	(0.157)		(0.209)		(0.437)	
Good	1.470	4.349**	3.148	23.280**	3.339	28.197**
	(0.246)		(0.265)		(0.407)	
Fair/Poor	1.491	4.440*	3.697	40.338**	4.868	130.001**
	(0.681)		(0.636)		(0.705)	
Constant	-0.864**	--	-2.396**	--	-4.835**	--
	(0.330)		(0.429)		(0.872)	

Source : Panel Study of Income Dynamics, 1984-1989; [a] Excellent health is the reference; * $p< 0.05$, ** $p<0.01$

Table 3: Multinomial Logit Model of Self-Reported Health Status in 1989 (N=1,418)

	Health Status[a]					
	Very Good		**Good**		**Fair/Poor**	
	Estimate (SE)	Odds Ratio	Estimate (SE)	Odds Ratio	Estimate (SE)	Odds Ratio
Debt Ratio (reference= no debt)						
Debt is 10% of annual income or less	0.436	1.547**	0.428	1.534*	0.646	1.907*
	(0.161)		(0.192)		(0.305)	
Debt is more than 10% of annual income	0.430	1.537*	0.641	1.898**	0.861	2.365*
	(0.206)		(0.240)		(0.377)	
Income (thousands of dollars)	0.002	1.002	-0.030	0.970	-0.075	0.927
	(0.011)		(0.023)		(0.0052)	
Age (reference= 30-39)						
Under 30	0.212	1.237	0.074	1.077	-0.505	0.604
	(0.283)		(0.345)		(0.713)	
40-49	-0.040	0.961	0.144	1.155	0.153	1.166
	(0.174)		(0.212)		(0.376)	
50-59	0.015	1.015	0.614	1.847*	1.240	3.456**
	(0.241)		(0.270)		(0.399)	
Over 60	0.151	1.163	0.622	1.862	1.000	2.719*
	(0.317)		(0.347)		(0.494)	
Education (reference= college or more)						
No high school diploma	0.541	1.718*	0.727	2.069*	1.050	2.858*
	(0.271)		(0.306)		(0.444)	
High schoold diploma only	0.342	1.407	0.726	2.068**	0.550	1.733
	(0.189)		(0.225)		(0.387)	
Some college	0.234	1.264	0.354	1.425	0.077	1.080
	(0.190)		(0.235)		(0.426)	
Marital Status (reference = married)						
Single	-0.067	0.936	-0.577	0.562	0.411	1.509
	(0.301)		(0.400)		(0.569)	
Divorced	0.168	1.183	0.180	1.198	0.475	1.607
	(0.296)		(0.330)		(0.462)	
Widowed	-0.001	1.000	-0.607	0.545	0.457	1.579
	(0.868)		(0.954)		(1.077)	
Missed work due to illness (1= Yes)	0.258	1.295	0.291	1.338	0.939	2.558**
	(0.194)		(0.216)		(0.293)	
Retired (1=Yes)	0.612	1.844	0.846	2.330*	0.993	2.698
	(0.402)		(0.419)		(0.531)	
Change in marital status (1= Yes)	0.111	1.117	0.268	1.307	0.490	1.632
	(0.217)		(0.254)		(0.389)	
Health Status in 1984						
Very good	1.617	5.036**	2.054	7.802**	1.083	2.953*
	(0.157)		(0.209)		(0.438)	
Good	1.473	4.361**	3.147	23.272**	3.344	28.326**
	(0.246)		(0.266)		(0.408)	
Fair/Poor	1.489	4.433*	3.702	40.536**	4.878	131.379**
	(0.681)		(0.636)		(0.706)	
Constant	-0.859**	--	-2.423**	--	-4.881**	--
	(0.330)		(0.429)		(0.879)	

Source : Panel Study of Income Dynamics, 1984-1989; [a] Excellent health is the reference; * p< 0.05, ** p<0.01

Table 4: Multinomial Logit Model of Self-Reported Health Status in 1989 (N=1,418)

	Health Status[a]					
	Very Good		**Good**		**Fair/Poor**	
	Estimate (SE)	Odds Ratio	Estimate (SE)	Odds Ratio	Estimate (SE)	Odds Ratio
Debt in 1984 only (1= yes)	0.118	1.126	0.124	1.132	0.590	1.805
	(0.220)		(0.260)		(0.402)	
Debt in 1989 only (1= yes)	0.328	1.388	0.122	1.130	0.730	2.075
	(0.234)		(0.278)		(0.425)	
Debt in both 1984 and 1989 (1= yes)	0.544	1.723**	0.702	2.018**	1.031	2.804**
	(0.184)		(0.216)		(0.350)	
Average income (thousands of dollars)	0.008	1.008	-0.039	0.962	-0.076	0.927
	(0.016)		(0.030)		(0.060)	
Age (reference= 30-39)						
Under 30	0.237	1.267	0.112	1.118	-0.497	0.608
	(0.284)		(0.345)		(0.715)	
40-49	-0.032	0.969	0.165	1.179	0.175	1.191
	(0.175)		(0.214)		(0.377)	
50-59	0.015	1.015	0.624	1.867*	1.304	3.686**
	(0.243)		(0.273)		(0.403)	
Over 60	0.166	1.181	0.695	2.004	1.086	2.963*
	(0.320)		(0.352)		(0.498)	
Education (reference= college or more)						
No high school diploma	0.583	1.791*	0.759	2.136*	1.102	3.011*
	(0.273)		(0.310)		(0.448)	
High schoold diploma only	0.388	1.474	0.778	2.177**	0.591	1.806
	(0.191)		(0.228)		(0.389)	
Some college	0.257	1.293	0.393	1.481	0.074	1.076
	(0.191)		(0.236)		(0.429)	
Marital Status (reference = married)						
Single	-0.045	0.956	-0.565	0.568	0.422	1.525
	(0.303)		(0.402)		(0.572)	
Divorced	0.177	1.193	0.182	1.200	0.510	1.664
	(0.296)		(0.331)		(0.459)	
Widowed	-0.019	0.981	-0.674	0.510	0.420	1.522
	(0.866)		(0.954)		(1.080)	
Missed work due to illness (1= yes)	0.250	1.283	0.295	1.343	0.926	2.525**
	(0.193)		(0.216)		(0.293)	
Retired (1=yes)	0.641	1.899	0.874	2.397*	1.083	2.953*
	(0.402)		(0.420)		(0.530)	
Change in marital status (1= yes)	0.122	1.130	0.294	1.342	0.497	1.644
	(0.217)		(0.254)		(0.386)	
Health Status in 1984						
Very good	1.622	5.061**	2.048	7.754**	1.090	2.975*
	(0.157)		(0.209)		(0.437)	
Good	1.489	4.432**	3.177	23.977**	3.370	29.073**
	(0.247)		(0.267)		(0.408)	
Fair/Poor	1.498	4.47*	3.690	40.038**	4.893	133.378**
	(0.681)		(0.636)		(0.705)	
Constant	-1.187	--	-2.576	--	-4.700	--
	(0.244)		(0.339)		(0.627)	

Source : Panel Study of Income Dynamics, 1984-1989; [a] Excellent health is the reference; * p< 0.05, ** p<0.01