Predictors Of Households' Debt Repayment Difficulties

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Households' probability of experiencing debt repayment difficulty in 1989 was examined using the 1,479 households in the 1983-1989 panel data of the Survey of Consumer Finances. The effects of 1983 household characteristics, attitudes and behavior regarding debt, debt portfolios, and intervening events were examined. Households were more likely to experience difficulty with debt repayment if they were younger, nonwhite, had larger households, had more positive attitudes toward credit had previous difficulty obtaining credit, had mortgage, automobile, or durable goods debt outstanding, had received financial support from relatives or friends, and had made major real estate transactions between 1986 and 1989.

Key Words*: Debt repayment, Household characteristics, Attitudes, Logit, Survey of Consumer Finances*

Despite abundant evidence that the incidence and severity of households' debt repayment difficulty is increasing, the etiology of these difficulties is not well understood. Researchers have examined only parts of this issue and then, too often using bivariate and/or cross-sectional analyses. Both of these methods create problems in trying to understand why certain households end up in difficulty repaying their debt. Making inferences about the causes of households' debt repayment difficulties from bivariate analyses is problematic. For example, suppose age and debt repayment difficulties are found to be negatively related in a bivariate analysis. Is that because younger households have more debt relative to their incomes than older households, or different types of debt from different types of financial institutions, or less job stability, or different attitudes toward borrowing and repaying debt than their older counterparts? A bivariate analysis cannot answer these questions.

Similarly, making inferences about the causes of household behavior from cross-sectional data is difficult. For example, if household income is found to be inversely related to debt repayment difficulty in a cross-sectional analysis, researchers are likely to suggest that inadequate household income causes the difficulty with debt repayment. However, is it just as plausible that families change their income-earning behavior in response to difficulties paying their debt? Or it may be that some other event, such as a spell of unemployment, the addition of a family member, or a health problem, may be responsible for both the observed household income and debt repayment difficulties in the cross-section.

Can we effectively explain future debt repayment difficulty by examining prior household characteristics and debt portfolios, credit attitudes and behavior, as well as the intervening events and behavior that may reduce or exacerbate financial pressure on households? That is the focus of this study, which examines this question using a multivariate analysis of data from 1,479 households in the panel dataset of the Survey of Consumer Finances, 1983-1989. Panel designs provide the powerful aid to causal inference of ordering cause-and-effect across time. In this study, the dependent variable is whether the household reported in 1989 having missed debt payments or currently being behind in the repayment of debt. Major predictors investigated were:

1. The demographic and economic characteristics of the households in 1983.
2. The attitudes toward credit and prior experiences with credit access of households in 1983 (specifically, whether households had credit card debt, mortgage debt, automobile debt, durable goods debt, other debt, or home improvement debt.)
3. The characteristics of the debt portfolio of households in 1983.
4. Events and household behaviors that occurred between 1983 and 1989 that may have had financial ramifications for households.

Debt Repayment Difficulties

Economic theory posits that consumers borrow in order to smooth out their lifetime stream of utility from consumption (Thurow, 1969); that is, at times when households' incomes do not match their utility-maximizing consumption, they borrow from future income or use past income saved to finance current consumption. The acquisition of debt represents the use of future income to pay for current

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consumption. The task of utility-maximizing households is to choose the optimal combination of present and future consumption within the constraint of present and future income. This theoretical perspective does not leave room for miscalculation or imperfect information. It assumes that the level of debt observed at any point in time must be the household's utility-maximizing level of debt with the household borrowing and repaying debt to remain at the equilibrium level (Bryant, 1990).

However, some borrowers must miscalculate, or, at least, make their debt acquisition and repayment decisions based on different reasoning than that suggested by economic theory, because there is abundant evidence that an increasing number of households have difficulty repaying their debt (see DeVaney & Lytton, 1995 for a recent review). The rapid and sustained increase in personal bankruptcy petitions during the past two decades has been well documented. This most drastic response to debt difficulty has been accompanied by similar increases in the number of households experiencing debt delinquency, default on debt, and foreclosure. It is unknown whether the increases in these problems result more from a change in the amount of debt households incur or a shift in the responses of households to debt problems. At least one study (Sullivan & Worden, 1995) has suggested that "the option to default" on debt is a benefit of using credit that households consider in their decision about which type of debt to incur (e.g., credit card debt) and their decisions about repaying (or not repaying) their debt.

While aggregate data on the incidence and extent of credit difficulties is well-known, only four studies (Canner & Luckett, 1990; Canner & Luckett, 1991; Livingston & Lunt, 1992; Sullivan & Fisher, (1988), each using cross-sectional data, have investigated factors related to debt repayment difficulties of households. Sullivan and Fisher (1988) and Canner and Luckett (1990) used data from 3,824 households in the 1983 Survey of Consumer Finances and studied the incidence of slow or missed debt payments. Canner and Luckett (1991) used data on 1,534 households from the 1990-91 Survey of Consumer Attitudes to analyze factors related to debt repayment problems. Livingstone and Lunt (1992) analyzed timely and regular debt repayment among predominantly lower-middle-class households in the United Kingdom in 1989. These researchers have assessed four types of factors for their effects on households' debt repayment or delinquency--households' demographic and economic characteristics, their attitudes and previous behavior regarding debt, characteristics of their debt portfolios, and unexpected events that may have contributed to financial difficulty.

The Effect of Demographic and Economic Characteristics of Households

The age of heads of households has consistently been found to be significantly negatively related to experiencing debt repayment difficulties, whether in bivariate or multivariate analyses (Canner & Luckett, 1990; Canner & Luckett, 1991; Sullivan & Fisher, 1988). Younger households have been found to be much more likely to experience debt delinquency than those headed by older people. This may be due to the higher levels of debt among younger households. The life-cycle income hypothesis suggests a mismatch between income and demand for goods at certain points in families' lives when they maintain consumption by borrowing from future income (Thurow, 1969). Some studies have found the amount of debt to be higher among younger households than among households with older heads (Duca & Rosenthal, 1990; Durkin & Elliehausen, 1977). However, installment debt has been found to be highest among middle-aged (age 35-54) households (Canner, 1988) and credit card use increases linearly with age up to age 65 (Lindley, Rudolph & Selby, 1989).

Several other demographic characteristics have been studied as predictors of debt repayment difficulties. Household heads' marital status was found to be related to debt delinquency by Canner and Luckett (1991). Divorced or separated heads were more likely to report debt payment problems than were married heads of households. Sullivan and Fisher (1988) investigated the effect of race and ethnicity on debt repayment difficulty. In their bivariate analysis, they found that households headed by nonwhite or Hispanic individuals had a higher incidence of debt delinquency than those headed by whites. Household size was indirectly studied in Canner and Luckett's (1990) study. They found that there was an increased probability of debt delinquency among households with more children.

The effect of household income on debt repayment difficulty has also been investigated with mixed results. In their bivariate analysis, Sullivan and Fisher (1988) found a significant effect of income on the risk of debt repayment difficulty. While among the lowest income group 37% of households reported repayment delinquency, only 7% of households in the highest

income group experienced delinquency in debt repayment. However, in their multivariate analysis Canner and Luckett (1990) found no effect of income, *ceteris paribus*, on the probability of debt repayment difficulty.

Other studies have not directly measured debt repayment difficulties, as in the present study, but have inferred a propensity for such problems from a measure of households' debt burden. The ratio of debt or debt repayment to household income has itself been used as a measure of debt burden, or the ability to repay debt. The average ratio of consumer installment debt to annual income of American families increased from 2% in 1945 to 18% in 1985 (Bloom & Steen, 1987) and 19% by 1989 (Canner & Luckett, 1990). Kennickell and Shack-Marquez (1992) revealed that the typical debt burden of families rose during the 1980s regardless of income and, among families with incomes lower than $10,000, the debt payment to income ratio rose from 32.1% in 1983 to 39.7% in 1989. They concluded that during the 1980s households' debt burden grew "most rapidly among those families with the greatest ability to pay" (Kennickell & Shack-Marquez, 1992, p. 16). This is, however, only indirect evidence that lower incomes may be associated with a greater likelihood of debt repayment difficulty.

The Effect of Attitudes Toward Credit and Prior Credit History

At any one point in time, households' future debt repayment behavior may be affected by their attitudes and their prior behavior regarding acquiring and repaying debt. Livingstone and Lunt's (1992) study of a sample of lower middle-class and upper working-class respondents in the United Kingdom in 1989 was the only study that has examined respondents attitudes in relation to their debt behavior. Examining factors related to debt repayment (the opposite of debt repayment difficulty or delinquency), they found that respondents with a more positive attitude toward credit were more likely to repay more debt than respondents with a negative attitude. They also examined motivations for borrowing--from the convenience of using credit to greed to responding to unexpected and uncontrollable events. Respondents who reported that their debt was the result of unexpected events were *more* likely to repay more debt than those who had other motivations for borrowing.

Some insights into household members' attitudes toward credit may be gleaned from knowledge of their prior use of it. Households' prior credit history as a factor affecting their debt repayment difficulty was studied by Canner and Luckett (1990). In their multivariate study, they found that whether or not the respondent reported having been previously turned down for credit was a strong predictor of debt repayment difficulty. Those respondents who had been previously rejected for credit were more likely to report having late or missed debt repayments as compared to respondents with no prior credit rejections.

The Effect of Households' Debt Portfolios and Sources of Credit

Characteristics of the households' debt portfolio have also been investigated as influences on households' debt repayment difficulty. Sullivan and Fisher (1988) and Canner and Luckett (1991) both studied debt payment to income ratios. Sullivan and Fisher (1988) found that households that had higher ratios of consumer debt payments to income and of mortgage debt payments to income had a higher incidence of missed or slow debt payments. Canner and Luckett (1991) found that debt-service burden was positively associated with debt delinquency.

Researchers have also studied the type of institution from which the households' credit was obtained and the use to which they put the borrowed money. Sullivan and Fisher (1988) found certain sources of credit to be associated with debt repayment difficulty. Specifically, when households had obtained their credit from finance companies, stores or dealers, they were more likely to have had debt repayment difficulties than if they had obtained credit from banks, credit unions, or savings and loan associations. Rather than investigating the type of institution from which the credit was obtained, Canner and Luckett (1991) investigated the type of credit. They found that households with automobile debt, those who had consumer installment debt, and those who had credit card debt more frequently reported debt delinquency than other households.

Sullivan and Worden (1995) suggested that households consider the option to default on their debt when they incur it, particularly credit card debt. They suggested that "less creditworthy households may self-select and use credit cards more intensely because of the valuable default option..." (p. 124). Studying data from account histories of active bank credit cards issued by a single Midwestern bank, they reported that aggressive use of credit card debt is associated with filing bankruptcy and with filing Chapter 7 (or straight)

bankruptcy. The inference here is that some debtors alter their debt repayment behavior in the face of options to default on their debt.

The Effect of Events

Although there is speculation in the popular literature that households' debt difficulty is the result of unexpected and uncontrollable events, the only study that has examined events that may influence households' debt delinquency was that of Canner and Luckett (1991). They reported that among families with a debt delinquency, 24% had a family member who had lost a job, were not employed, or had experienced a reduction in the number of hours worked. Another 6% of the delinquent households had experienced problems related to a family member's medical condition. A much larger proportion of delinquent households (55%) reported that they had simply become overextended (that is, without any of these unexpected or events occurring).

In summary, the few studies that have examined debt repayment difficulties among households have examined demographic and economic characteristics of the households, respondents attitudes toward credit and their previous difficulty with obtaining credit, the characteristics of their debt portfolios, and events which may have economics ramifications for the households. But, none of the studies reviewed have examined all of these factors simultaneously. Additionally, none of the studies has used a panel design that may strengthen the ability to make causal inferences about the etiology of households' debt repayment difficulties.

Hypothesis

Based on previous literature, these hypotheses will be tested in this study.

1. *Ceteris paribus*, households will be more likely to have debt repayment difficulties in 1989 if they had a lower income, the household was larger, and the respondent was younger, nonmarried, nonwhite, and not employed in 1983.
2. *Ceteris paribus*, respondents' attitudes toward debt and their previous experiences with access to credit in 1983 (both having been turned down and having balked at applying for credit) will be associated with their likelihood of debt repayment difficulty in 1989. Respondents with attitudes more accepting of using credit and those who have previously had difficulty obtaining credit will be more likely than others to report debt repayment difficulty.
3. *Ceteris paribus*, characteristics of households' debt portfolios in 1983 will be related to their likelihood of debt repayment difficulty in 1989. Different types of debts will be differentially related to the likelihood of debt repayment difficulties. Particularly interesting is whether having outstanding credit card debt will be associated with an increased likelihood of experiencing debt repayment difficulties.
4. *Ceteris paribus*, households will be more likely to have debt repayment difficulties in 1989 if they experienced events and/or made decisions between 1983 and 1989 that placed them at risk for reductions or interruptions in income or increased consumption demands. Events such as changing employment, experiencing an illness or disability, giving or receiving support from sources outside the household, buying, selling, or improving a residence or other real estate, changing household composition, and making major financial transactions will be examined for their effect on subsequent debt repayment difficulty.

Methods

Sample

Panel data from the 1983-1989 panel of the Survey of Consumer Finances, which contains a national probability sample of 1,479 households, were used. The data were weighted to compensate for the oversampling of high income households and the differential nonresponse (Avery & Elliehausen, 1985; Herringa, Conner, & Woodburn, 1994; Kennickell, 1995). The dataset contained three implicates of the missing data (Kennickell & McManus n.d.).; however, very small and statistically insignificant differences were found across implicates on all the variables and in all of the multivariate analyses in this study. Thus, all analyses reported were performed on the first implicate.[a]

Variables

The dependent variable was comprised of two items measured in 1989. Respondents were asked, "[t]hinking of all the various loan payments you made during the last year, were all the payments made the way they were scheduled, or were payments on any of the loans sometimes made later or missed?" The responses included: "all paid as scheduled", "sometimes got behind or missed payments", and "payments not due/started yet". Slightly fewer than one-tenth (9.7%) of the sample indicated they sometimes got behind or missed payments on their loan(s). The second item was, "[w]ere you ever behind in your payments by two months or more?" Responses

available were yes, no, and inappropriate and 3.6% of the sample indicated they have been behind in their payments by two months or more. These two items were combined into a single variable that was coded one if respondents indicated they had gotten behind or missed payments on either or both of the items; 13.3% of the sample comprised this group.

The independent variables in the hypotheses and descriptive statistics for each are shown in Table 1. Respondents' age, total gross household income, and household size were measured as continuous variables. In 1983, the mean age of respondents was about 47 years, the mean household income was slightly over $30,000 (median income was approximately $21,500), and the mean household size was 2.61 persons. Respondents' marital status, race, and employment status were included as dummy variables, coded one when the respondent was married, white, and employed, respectively, and zero otherwise. About three-fifths of the respondents were married and almost four-fifths were white. Slightly under half of the respondents were employed in 1983 and the other half included respondents who were not employed, unemployed, in school, and retired.

Respondents' willingness to use credit was measured with an index of their feelings about whether using credit was all right for five different purposes (vacation trip, living expenses, fur coat or jewelry, car, and educational expenses). The measure is the sum of the number of affirmative responses with a range of 0-5. The respondents averaged a score of 2.35 on the credit attitudes scale, which indicated that respondents, on average, approved of between two and three of the specific uses of credit. About 16% of the respondents reported that they had been turned down for credit when they had applied. Another 9% had decided against applying for credit because they feared that they would be turned down.

Households' debt portfolios were measured with dichotomous variables indicating whether households had each of six types of debt: credit card debt, mortgage loans, automobile loans, durable goods loans, home improvement debt, and other debt (for instance, loans on a life insurance policy, or debts to some other person or bank or employers, student loans, or margin accounts with a broker). The type of debt outstanding that was reported by the most respondents was credit card debt with about two-fifths of households reporting outstanding credit card balance(s). Slightly under 40% reported having an outstanding mortgage and about one-third had an automobile loan outstanding. About one-fifth of the households reported a debt for the purchase of durable goods, such as furniture or appliances. Other debt and home improvement debt was reported by small percentages of households, 13.4% and 4.7%, respectively. A seventh type of debt, investment debt, was reported so infrequently (by less than one percent of respondents) that it was excluded from further analysis.

Table 1

Descriptive Data, Survey of Consumer Finances Panel Data, 1983-1989 (n=1,479)

Variable	*% Yes*	Mean	Std. dev.
Demographic Characteristics in 1983			
Respondent's age (years)		46.99	16.15
Household income ($)		$30,081	$ 48,579
Household size (number of persons)		2.61	1.43
Respondent's marital status (married)	58.8		
Respondent's race (white)	79.3		
Respondent's employment status (employed)	47.7		
Debt attitudes and behavior in 1983			
Approval of various uses of credit (yes)		2.35	1.00
Turned down for credit (yes)	16.1		
Balked at applying for credit (yes)	8.9		
Debt portfolio in 1983			
Have credit card debt	40.5[a]	$ 372	$ 812
Have mortgage debt	39.8	10,673	20,565
Have auto debt	33.4	1,227	2,687
Have durable goods debt	20.7	432	2,435
Have other debt	13.4	1,686	21,098
Have home improvement debt	4.7	221	1,774
Debt totals in 1983			
Consumer debt	68.7	5,770	184,940
Total debt	75.5	33,994	229,823

[a]The percentage of households having a nonzero balance on each type of debt.

Another set of variables representing households' debt portfolios were constructed, the amount of the outstanding balance for each of the aforementioned types of debts. Table 1 also shows the mean amounts (and standard deviations) of each type of debt in 1983 dollars. The largest balances, on average, were reported by households for mortgage debt, other debt, and automobile debt. The amounts of debts were also summed into consumer debt (excluding mortgages and real estate related debt) and total debt. Slightly over two-thirds of households had outstanding consumer debt and the average debt owed was just over $5,000. Three-fourths of households had some total debt (including mortgages and real estate debt) outstanding with an average balance of almost $34,000.

The last set of independent variables are those events and behaviors that occurred in the intervening period from 1983 to 1989 (Table 2). Each of these was measured by a dichotomous variable coded one if the event or behavior occurred and zero otherwise. Employment changes were fairly frequent over the six year period. About one-fifth of respondents had changed employment over the period, about two-thirds of those changing for voluntary reasons (such as quitting or retiring) and about one-fourth changing because of involuntary reasons (such as becoming disabled or being laid off or the business being discontinued). A surprisingly large proportion of households (40.3%) had a family member with a major illness or disability since 1986.

Fewer than one in ten households received either public assistance (such as from ADC, AFDC, or SSI) over the period or received financial assistance from relatives or friends. However, a higher proportion (about 13%) of households gave financial support to relatives or friends (which included paying alimony or child support to non-household members).

A variety of housing and real estate related events were also measured. The most frequently reported housing-related event was making major improvements in the households' primary residences, which was reported by over one-fourth of households. About one-fifth of families had bought a home since 1983. Events concerning other real estate (other than the primary residence), such as selling it or making major improvements to it, were reported less frequently than events related to the primary residence.

Few household composition changes with financial implications were reported. Fewer than 5% of households either had a person join the household with $5,000 or more in assets or debts or had a person leave the household in the same circumstances. However, over half of the households had purchased or leased a vehicle since 1986, the most frequent occurrence over all of the events measured. Fewer than one-fifth of households had purchased major durable goods in the past three years and only about one-eighth had made other large expenditures such as paying for a child's marriage or a lawsuit payment.

Data Analysis

The hypotheses tests were conducted with logistic regression. In model estimation, the dependent variable becomes the log odds of experiencing debt repayment difficulty and the equation is estimated via maximum likelihood. Unstandardized and standardized coefficients are tested for statistical significance with a Wald chi-square statistic. Coefficients are made more interpretable through the calculation of odds ratios[b] for respondents who are one unit different on X_k. The statistical significance of the entire model is assessed via a chi-square and the improvement in predictive efficacy over a null model can be assessed with a pseudo-R^2 (Hosmer & Lemeshow, 1989).

In addition to testing the effects of each of the variables specified in the hypotheses on the probability of households' experiencing later debt difficulty, a set of additional questions may be posed. Does knowing the earlier composition of households' debt portfolios improve our understanding of future debt repayment difficulty, over and above the predictive efficacy of the households' 1983 characteristics? Likewise, do intervening events that occur (both those that are under the households' control and those that are more unexpected and uncontrollable) add to our understanding of future debt repayment difficulty? These questions were answered by testing a set of hierarchical models. First, a model with only the 1983 characteristics of the sample was estimated. Next, the variables reflecting the debt portfolio of households in 1983 were added in a second estimate. Finally, a full model adding the events and behaviors between 1983 and 1989 was estimated. The statistical significance of each model was tested against the prior model by computing a chi-square difference test using the model chi-squares of an extended model and a restricted model.

Results of Hypotheses Tests

A logistic regression model incorporating only the 1983 characteristics of the households (including the demographic characteristics and debt attitudes and behavior) was first estimated (Model A in Table 3). This produced a log likelihood ratio of 1,012.47 and a model chi-square of 144.14 ($p < .001$). Model B included the households' debt portfolio in 1983 as well as their 1983 households characteristics. Its log likelihood of 967.25

Table 2
Incidence of events between 1983 and 1989 (n=1,479, weighted data)

Type of event	n	%
Employment and health changes		
Employment changed since 1983	281	19.0
"Was that January 1983 job with (his/her) present employer, another employer, was (he/she) self-employed, or what?" 1= different employer, or self-employed in 1983 but not now, or self-employed now, but not in 1983.		
Changed employment because of voluntary reason(s)	187	12.7
"What was the reason (he/she) left (that job/self-employment)? 1 = retired or quit; 0 = else		
Changed employment because of involuntary reason(s) Question same as above	73	4.9
1 = disabled or business closed; 0 = else		
Experienced illness or disability	596	40.3
"During the past three years did you (or anyone in your family living here) have a major illness or disability which required hospitalization or cost more than $1,000?"		
Support received or given		
Received public assistance	109	7.4
"During either 1986 or 1987, did you (or anyone in your family living there) receive any income from ADC, AFDC, SSI, or other public assistance?"		
Received worker's compensation/unemployment	85	5.7
"During either 1986 or 1987, did you (or anyone in your family living there) receive any worker's compensation or unemployment benefits?"		
Received support from relatives or friends	115	7.8
"During either 1986 or 1987, did you (or anyone in your family living there) receive any financial support form relatives or friends who do not live here, or receive any alimony or child support payments		
Gave support to relatives or friends	191	12.9
"During either 1986 or 1987, did you (or anyone in your family living there) provide any financial support for relatives or friends who do not live here, or pay any alimony or child support payments?"		
Housing/real estate related events		
Sold home	176	11.9
"Since January 1983, have you (or anyone living here) bought or sold a home that was your primary residence?"		
Bought home	296	20.0
"Since January 1983, have your (or anyone living here) bought or sold a home that was your primary residence?"		
Made major improvements in primary residence	404	27.3
"Since January 1983, did you (or anyone in your family living here) make any major additions or home improvements to a primary residence that you owned? (Do not count general maintenance or upkeep.)"		
Sold other real estate	88	6.0
"Since January 1983, have you (or anyone in your family living here) sold any real estate other than your principal residence, such as a vacation home, land, or rental or investment property?"		
Made major improvements in real estate		

83 5.6

"Since January 1983, did you (or anyone in your family living here) make any major additions or home improvements to any real estate properties you own? (Do not count general maintenance or upkeep.)"

Household composition events with financial implications

Household member joined with assets

39 2.7

"Is there anyone in your family living with you now who has joined the family since 1983 and who had $5,000 or more in assets or debts at the time they joined the family? (IF R ASKS: DO NOT INCLUDE NEW SPOUSE.)"

Household member departed with assets

"Sometimes changes in a family's savings or assets are due to people joining or leaving the family. Was there anyone 53 3.6 living with you in 1983 who doesn't live with you now who took $5,000 or more in assets or debts away with them? (IF R ASKS: DO NOT INCLUDE SPOUSE)"

Major financial transactions

Purchased or leased vehicle(s)

798 53.9

"During the past three years, have you (or anyone in your family living here) purchased any kind of vehicle-car, business or any leased vehicle?"

Purchased major durables

270 18.3

"During the past three years, have your (or anyone in your family living here) made purchases totaling $3,000 or more for any furniture, appliances, or recreation items?"

Make other large expenditures

185 12.5

"During the past three years, did you have any late expenses that you paid for yourself, such as a child's marriage, a lawsuit, or any other large expenses you have not mentioned already?"

had a chi-square of 189.36 ($p < .001$). The full model (Model C), including 16 additional variables reflecting events occurring between 1983 and 1989, resulted in -2 log likelihood of 921.50 with a model chi-square of 235.11 ($p < .001$). The chi-square difference test between models A and B was 45.22 with 6 degrees of freedom ($p < .001$), which indicates the addition of the debt portfolio variables significantly improved the model. The chi-square difference test between models B and C was 45.75 with 16 degrees of freedom ($p < .001$), which indicates the addition of the intervening events significantly improved the model. Each of these test results indicates that at least one of the additional variables (i.e., the debt portfolio and intervening events) is important in understanding the later debt difficulties of households. The pseudo R^2 indicates the improvement in the predictive efficacy of the hypothesized model, compared with a null (intercept-only) model or a nested model (Hosmer & Lemeshow, 1989). In the initial model, the pseudo R^2 was .125 and in the full model (presented in Table 3), the pseudo R^2 was .20. The initial model represents a substantial improvement over the null model, and the full model also provides improvement in predictive efficacy over the restricted models.

The complete results of the estimation of the full model are shown in Table 4. The first set of hypotheses posited effects of 1983 characteristics of households on their debt repayment difficulties. Three demographic characteristics of the respondents and households were significantly related to households' debt repayment difficulties. Households with younger respondents had higher odds of having such difficulties than those with older respondents. Larger households were more likely to have had debt repayment difficulties than smaller households. Nonwhite respondents reported a greater likelihood of debt difficulties in 1989 than white respondents. The odds of experiencing debt repayment difficulty are about one-half as large for households with white respondents as they are for those with nonwhite respondents (based on the odds ratio of .47).

Several other household characteristics previously reported as affecting debt repayment difficulties were not found significant here. *Ceteris paribus*, household income, respondents' marital status, and respondents' employment status were not significant in the model. In the case of income and employment status, this lack of effect was not due to their relationships with the various types of debt in the households' debt portfolio. Both of these variables were moderately correlated with having various types of debt in 1983, but their effects did not

Table 3

Hierarchical Logistic Regression Models (standardized

estimates) of the Log Odds of Households' Debt Repayment Difficulties in 1989 (n=1,479)

Independent variable	Model A	Model B	Model C
Demographic characteristics in 1983			
Respondent's age (years)	-.29***	-.23***	-.26***
Household income ($)	-.01	-.05	-.05
Household size (number of persons)	.11*	.10	.11*
Respondent's marital status (married)	.16**	.10	.10
Respondent's race (white)	-.16***	-.17***	-.17***
Respondent's employment status (employed)	-.06	-.08	-.08
Debt attitudes and behavior in 1983			
Attitudes toward credit	.14**	.15**	.17**
Turned down for credit	.13**	.12**	.13**
Balked at applying for credit	.08 *	.09 *	.09*
Debt portfolio in 1983			
Have credit card debt		-.08	-.08
Have mortgage debt		.14**	.11*
Have auto debt		.17***	.19***
Have durable goods debt		.18***	.16***
Have other debt		.06	.01
Have home improvement debt		.03	.04
Health and employment changes since 1983			
Involuntarily changed employment			.02
Had major illness of disability			-.06
Support received or given since 1983			
Received public assistance			-.08
Received workers' compensation			-.04
Received support from relatives or friends			.14***
Gave support to relatives or friends			.01
Housing/real estate events since 1983			
Sold home			-.04
Bought home			-.09
Made major improvements in home			.05
Sold other real estate			.20***
Made major improvements in real estate			-.14*
Household composition changes since 1983			
New household member joined with assets			.03
Household member departed with assets			-.02
Major financial transactions since 1986			
Purchased or leased vehicles			-.00
Purchased major durable(s)			-.07
Made other large expenditure(s)			-.06
-2 Log likelihood	1012.47	967.25	921.50
Chi-square	144.14***	189.36***	235.11***
Pseudo R-square	.125	.164	.203

* p < .05 ** p < .01 *** p < .001

Table 4
Final Logistic Regression (Details of Model C) of the Log Odds of Households' Debt Repayment Difficulties in 1989 (n=1,479)

Independent variable	Coefficient	Standardized estimate	Wald chi-square	Odds ratio
Demographic characteristics in 1983				
Respondent's age (years)	-.029	-.26	11.38***	0.97
Household income ($)	-.002	-.05	0.22	
Household size (number of persons)	.142	.11	4.14*	1.15
Respondent's marital status (married)	.362	.10	2.56	
Respondent's race (white)	-.754	-.17	13.06***	.47
Respondent's employment (employed)	-.324	-.08	1.61	
Debt attitudes and behavior in 1983				
Attitudes toward credit	.298	.17	8.77**	1.35
Turned down for credit	.633	.13	8.58*	1.88
Balked at applying for credit	.587	.09	4.77*	1.80
Debt portfolio in 1983				
Have credit card debt	-.314	-.08	2.25	
Have mortgage debt	.412	.11	3.97*	1.51
Have auto debt	.716	.19	15.22***	2.05
Have durable goods debt	.707	.16	13.83***	2.03
Have other debt	.046	.01	0.04	
Have home improvement debt	.352	.04	0.99	
Health and employment changes since 1983				
Involuntarily changed employment	.104	.02	0.22	
Had major illness of disability	-.217	-.06	1.33	
Support received or given since 1983				
Received public assistance	-.552	-.08	2.00	
Received workers' compensation	-.273	-.04	0.52	
Received support from relatives/friends	.97	.14	12.27***	2.64
Gave support to relatives or friends	.052	.01	0.04	

Housing/real estate events since 1983								
Sold home		-.220		-.04		0.40		
Bought home		-.399		-.09		2.08		
Made major improvements in home		.205		.05		1.04		
Sold other real estate		1.509		.20		20.15***		4.52
Made major improvements in real estate	-1.083		-.14		4.19*		0.34	
Household composition changes since 1983								
New household member joined with assets		.318		.03		0.39		
Household member departed with assets	-.175		-.02		0.13			
Major financial transactions since 1986								
Purchased or leased vehicles	-.015		-.00		0.01			
Purchased major durable(s)		-.345		-.07		2.02		
Made other large expenditure(s)		-.319		-.06		1.38		

* p < .05 ** p < .01 *** p < .001

differ across all models tested. The effect of respondent's marital status was initially significant (albeit weakly) when the effects of the types of debt were not controlled. However, controlling for differences in the types of debts held by these households in 1983 made differences in debt repayment difficulty in 1989 disappear.

The second set of hypotheses concerned the effects of respondents' attitudes toward credit and their previous experiences with access to credit. All three measures of respondents attitudes toward credit and debt behavior in the initial period (1983) were significantly related to debt repayment difficulty in 1989. Respondents whose attitudes were more supportive of using credit for more purposes were more likely to report debt repayment difficulty than respondents who expressed more skepticism toward borrowing. Respondents who had previously been turned down for a loan or who had balked at applying for credit for fear of being turned down were more likely to have experienced debt repayment difficulty than respondents without these past experiences.

The effect of the composition of the households' debt portfolios was the focus of the third set of hypotheses. Having three types of debt--mortgage debt, automobile debt, and durable goods debt--were significantly related to the likelihood of experiencing debt repayment difficulty. If the households' debt included a mortgage, an outstanding loan for an automobile in 1983 or a debt for a durable good, they were more likely to have reported in 1989 that they had missed or been behind on a debt payment. The two types of debt that appear to make the largest difference are automobile debt and durable goods debt; the odds ratios indicate that the odds of experiencing debt repaying difficulty in 1989 are about twice as large for households who had each of these types of debt as for those who do not. The other types of debt, including (interestingly) whether or not they had credit card debt in 1983, were not related to the future probability of experiencing debt repayment difficulty.

Because it may be suggested that the reason why households end up having difficulty repaying their debt is because they have "too much debt," several alternative tests regarding the effect of households' debt portfolios were also done. We substituted the amount of each type of debt households owed in 1983 for the dichotomous variable of whether they had each type of debt and also estimated two models substituting the amount of consumer debt outstanding in 1983 and the total amount of debt owed in 1983 (including mortgage and real estate debt) for the amounts of each type of debt. In no case was an amount of debt outstanding (either the subsets of the types of debts or the totals) statistically significantly related to the probability of debt repayment difficulty in 1989. Neither did the substitution of these measures of the households' debt portfolio for the variables shown in Table 4 change any of the results of the other factors.

The fourth set of hypotheses tested the effect of a series of variables reflecting events and changes that had occurred between 1983 and 1989 on the probability of having debt repayment difficulties. Three of these were significantly related. If households had received financial support from relatives or friends, their odds of debt repayment difficulties were higher than if they had not. If households had sold real estate (other than their principal residence) in the interim between 1983 and 1989, they had higher odds of debt repayment difficulties. Finally, if households had made major improvements in real estate (other than their principal residence), that increased their odds of debt repayment difficulties. The odds ratios in the final column illustrate the effect of the significant variables in a

more interpretable way. For example, the odds of debt repayment difficulty for households who had sold other real estate in the interim between 1983 and 1989 are about 4.5 times as large as the odds for households who had not. This is among the strongest effects in the entire model.

Interestingly, several other events that have been popularly thought to be associated with debt repayment difficulty were not found to be significant here. For example, having received public assistance or workers' compensation benefits since 1983 had no effect on the likelihood of experiencing debt difficulty. Changes in household composition during 1983-1989 were not related to debt repayment difficulty in 1989. Purchasing or leasing vehicles or other large expenditures had no effect (independently of any debts incurred in their purchase) on the probability of experiencing debt repayment difficulty. Note that this lack of effect may have been caused by the more limited time period of these items (only measured over the 1986-1989 period). Finally, if a household member experienced a major illness or disability, that had no effect on the odds of a later debt repayment difficulty.

Discussion and Conclusions

Predicting future debt repayment difficulties in advance of households actually experiencing them is valuable to several groups. Practitioners such as debt counselors could focus their efforts on households at greater risk for experiencing debt repayment difficulties. Consumer educators could disseminate information regarding the risk factors in an effort to help households become more knowledgeable of such risks and perhaps avoid such difficulties. Lenders could use this information to make better lending decisions that would reduce their exposure to debt delinquency and default.

To that end, this study examines the "leading indicators" of households' debt repayment difficulties. What does this study add to our knowledge of the etiology of debt repayment difficulty of American households, as measured by having missed or getting behind on debt payments? Significant predictors found here include aspects of all four types of factors examined, including the demographic and economic characteristics of households, their attitudes and previous behavior regarding credit, the types of debts they owe, and economic decisions that they make over time. Households whose odds of experiencing debt repayment difficulty are greater are those headed by younger and nonwhite respondents and larger households. More accepting attitudes toward credit are positively associated with debt difficulty later, as is previous difficulty with obtaining credit. The types of debt posing a risk for higher odds of debt difficulty are mortgage debt, automobile debt, and durable goods debt. Interestingly, having outstanding credit card debt (sometimes indicted as the primary source of credit repayment problems) was not significantly related to future debt repayment difficulties.

The simple answer to the question about why families end up in debt difficulty is that they have "too much" debt. The answer to that questions appears, from the multivariate analysis done here, to be considerably more complicated. While having certain types of debt appears to be related to future debt repayment difficulties, the amounts of debt outstanding, either of certain types of debt or total debt owed, does not appear to be related to the propensity to miss debt payments.

Our model also included 16 variables representing events or behaviors that occurred between 1983 and 1989: (a) changing employment, (b) experiencing illness or major disability, (c) giving or receiving financial support, (d) housing or real estate events, (e) family composition changes, and (f) major financial transactions. Some of these were reported by many households, such as purchasing or leasing a vehicle or experiencing a major illness or disability, whereas other intervening events were relatively rare, such as family composition changes and the receipt of public assistance. Only three of these intervening events were significantly related to debt repayment difficulty in 1989: having received support from relatives or friends, having sold real estate (other than the primary residence) and having made major improvements in real estate since 1983. Other events, such as experiencing family composition changes with financial implications, having an illness or disability, or making major financial transactions, had no predictive power for debt repayment difficulty.. Further, it appears that the events that matter are not the suspected "involuntary" events often thought to cause debt crises in households (such as being fired from a job or becoming ill), but rather those events that reflect or even result from households themselves making economic decisions.

Most studies of households' financial difficulties have examined via cross-sectional designs only samples of households who have ended up in serious difficulty, such as studies of bankruptcy petitioners (e.g., Kane,

Balestreri, Oetzel, Jelak, & Paul, 1992; Kowalewski, 1982; Sullivan, Warren & Westbrook, 1989). While those studies can illuminate the characteristics and debt status of those families who are in that situation, they cannot tell us much about the etiology of the difficulty. If families are to be given the best chance of receiving the benefits of borrowing and avoiding the costs of ending up in difficulty repaying their debt, further studies are needed that follow families through the dynamics of decision-making about the acquisition and repayment of debt.

Endnotes

a. *For many variables in this study, few missing values had to be imputed. But, to ascertain whether there were significant differences across the imputations, repeated measures ANOVAs were performed on all of the important variables across the three implicates; in addition, the logistic regression analyses were run on the models for all three implicates.*

b. *Because the dependent variable in logistic regression is a log odds, the unstandardized logistic regression coefficients are not interpretable like those in OLS regression. The odds ratio calculated from the coefficient (b_k) is estimated as exp (b_k) and is interpreted as the ratio of the odds of being in the modeled category (in this case, having debt repayment difficulty) of households (versus not being in the modeled category) which are one unit apart on a given independent variable, controlling for other predictors in the model (DeMaris, 1995, p. 959-960).*

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