

Linking Consumer Debt and Consumer Expenditures: Do Borrowers Spend Money Differently?

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This study uses data from 5,174 households in the 1994-1995 Consumer Expenditure Surveys to investigate differences in expenditure patterns between households who borrow money and households who do not borrow money. Findings show that, holding total expenditure constant, compared with otherwise similar nonborrowers, borrowers spend less money on necessities such as shelter, food at home, and utilities, but more money on some luxury commodities that have the potential for social display, such as car purchases, household furnishings and equipment, and entertainment. Furthermore, borrowers are found to be almost unitarily income elastic with respect to apparel, medical services, alcoholic beverages, and food away from home, whereas these commodities are luxuries for nonborrowers. Borrowers are also found to spend more money on health insurance and prescription drugs and medical equipment, possibly due to poor health. Theoretical and empirical implications of this research are discussed in this study.

In 1996, a historical high of 989,172 people filed for personal bankruptcy in the United States, up from 806,816 in 1995. The number of personal bankruptcy filings was about 9.9% higher than the second historical high in 1992 and was 70.4% higher than that in 1989 (U.S. Bureau of the Census, 1997, Table 856).

Excluding mortgages, total installment credit outstanding in 1996 was \$1,194.6 billion, up from \$1,103.3 billion in 1995 and \$781.9 billion in 1989. The outstanding revolving debt was \$462.4 billion, up from \$413.9 billion in 1995 and \$198.6 billion in 1989. In 1992, for the first time in history, total revolving debt exceeded the total amount in automobile loans (a major part of the total installment debt) (U.S. Bureau of the Census, 1997, Table 798).

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These statistics suggest that consumer borrowing has been on the rise, especially in the form of revolving credit. Accompanying this trend of increasing consumer borrowing, more and more consumers are getting into debt trouble. This high level of consumer credit may cause concern for several reasons. First, to the extent that individuals may become subject to liquidity constraints, a high level of debt may reduce future consumer expenditures, aggregate demand, and therefore economic activity. Second, the rise in personal bankruptcy and a higher level of default rates can adversely affect the soundness of the financial system (Paquette, 1986). Third, for those consumers who get into financial trouble because of their excessive use of credit, there are usually negative financial consequences such as foreclosures of their homes and negative psychological consequences such as stress and depression.

Past studies have differentiated borrowers from nonborrowers in terms of differences in socioeconomic status and personality traits, but no study to date has used expenditure data to explore the link between consumer expenditure patterns and consumer debt. This link is important, not only because of its theoretical importance in understanding consumer debt but also because of its practical importance in providing budget guidelines for consumer credit counseling.

This study is an attempt to fill this void. The purpose of this article is to investigate, in detail, what link consumer borrowing has to consumer expenditure patterns. The article is organized as follows: Its second section provides a literature review, followed by a discussion of related theories and proposed hypotheses. Data and the method of sample selection are discussed in the fourth section, followed by a description of measurements of variables and analytical methods used in this study. Descriptive statistics are provided in the sixth section, and the results of the statistical analyses and discussions of the results are then presented. Conclusions of the study are provided in the eighth section. The article ends with a discussion of limitations and implications of the study.

REVIEW OF LITERATURE

The Rise of Consumer Debt

In 1995, 66.4% of American families owned at least one credit card, up from 66.2% in 1992 and 55.8% in 1989. Only 51.9% of these families

paid their balance in full every month in 1995, whereas the other 48.1% of the families paid their balance in full only sometimes or hardly ever. The percentage of people who paid off their balance in full was higher in 1992 (52.8%) and 1989 (53.1%) (U.S. Bureau of Census, 1997, Table 800).

The loan delinquency rate of installment debt is also on the rise. In 1995, the delinquency rate on closed-end installment loans was 2.12%, lower than the historical high of 2.64% in 1989 but up from 1.72% in 1994. More alarmingly, in 1995, the delinquency rates on bank card loans, revolving credit loans, and home equity loans were all at historical highs of 3.34%, 3.14%, and 0.90%, respectively (U.S. Bureau of the Census, 1997, Table 797).

Differentiating Debtors From Nondebtors

The dominant economic theory on why people borrow and save is the life cycle hypothesis of saving (Ando & Modigliani, 1963). This theory suggests that consumers use borrowing and saving to smooth their consumption during their life cycle to maximize lifetime utility. Factors affecting consumer borrowing/saving, therefore, include current income, expected future income, life cycle stage, and the rate of time preference. Consumers with higher expected future income and higher rate of time preference are more likely to borrow than consumers with lower expected future income and lower rate of time preference. Because younger consumers usually have higher expected future income than older consumers, younger people are more likely to borrow. These theoretical predictions have been tested and confirmed by several studies using household-level data (Cameron & Golby, 1990a, 1990b, 1991).

Sociological and psychological research has contributed much to the literature of consumer debt by investigating why some people have higher rates of time preference than others. It has been suggested that tolerant attitudes toward personal debt, lack of self-control, sensation seeking, external locus of control (i.e., blaming external factors for their financial difficulties), and use of improper social reference groups have a significant impact on consumer debt (Lea, Webley, & Levine, 1993; Lea, Webley, & Walker, 1995; Livingstone & Lunt, 1992a, 1992b; Tokunaga, 1993). From the perspective of the life cycle hypothesis of saving, together with other demographic variables

such as education, these personal characteristics determine a person's rate of time preference and therefore have an impact on consumer debt.

In explaining the rise in consumer debt in the United States in recent years, researchers have suggested that liquidity constraints are much less of a problem nowadays than before, in that it is much easier today for consumers to get credit than just several years ago. Also, creditors have used many advertising tools to induce people to borrow money. In addition, there is a widespread view that attitudes toward debt have changed radically during this century, with a shift from general abhorrence of debt to acceptance of credit as a part of a modern consumer society (Lea et al., 1995).

Differences in Consumer Expenditure Patterns

The differences in consumer expenditure patterns between borrowers and nonborrowers have not been explicitly studied in a scholarly context. However, sociologists and social psychologists have suggested that debt-tolerant or debt-inducing norms might be generated if a consumer adopts a reference group with more economic resources than he or she has (Newcomb, 1943, as cited in Lea et al., 1995). Such social comparison can lead to status-driven expenditures. Lunt and Livingstone (1991) reported that such social comparisons figure prominently in lay explanations of others' debt, although Walker, Lea, and Webley (1992, as cited in Lea et al., 1995) found that debtors themselves do not use social comparison to account for their own debts. Livingstone and Lunt (1992a, 1992b) also suggested that debtors are more likely to express their social worth and social relations through consumption, buying presents for themselves and others as rewards and bribes. In addition, debtors were thought to get into financial difficulties through treating as necessities goods whose only function is social display.

Although previous research has suggested possible differences in consumer expenditure patterns between borrowers and nonborrowers, no study has investigated such differences empirically. The purpose of this article is to use data from the Consumer Expenditure Survey to investigate the link between consumer borrowing behavior and consumer expenditure patterns.

THEORY AND HYPOTHESES

Neoclassical consumer demand theory suggests that consumer expenditure on the i th commodity is determined by the consumer's permanent income, the market prices the consumer faces, and the consumer's preferences.

Mathematically, the demand function for commodity i can be expressed as follows:

$$W_i = w_i(M, P, PR), \quad (1)$$

where W_i is the expenditure on commodity i , M is permanent income, P is a vector of market prices, and PR is the consumer's preferences.

Conventionally, consumer demographic variables, such as age, family composition, race or ethnicity, education, and housing tenure, are used as preference shifters, under the assumption that consumers with similar demographic characteristics have similar preferences.

Two of the factors in Equation (1) may be different for borrowers compared with nonborrowers: permanent income M (total expenditure is usually used as a proxy) and preference PR . First, compared with a consumer with the same level of disposable income, a borrower has a higher level of total expenditure compared with a nonborrower. This income effect of borrowing is likely to lead borrowers to spend more on luxury commodities than nonborrowers with the same level of current income. Second, everything else being equal, borrowers are more present oriented than nonborrowers. Conventionally used demographic variables mentioned above may not be able to capture such differences in consumers' time preference because part of the differences in time preference is likely to be psychological. It is possible that such differences in time preference are correlated with differences in preferences regarding allocation of resources among different commodities. For example, the desire of having things now rather than later may be correlated with impulsive buying behavior. Such impulsive buying behavior may be concentrated in certain areas of consumption. The psychological literature has also suggested that consumers with a high rate of time preference are more likely to be sensation seeking (Lea et al., 1993, 1995; Livingstone & Lunt, 1992a, 1992b; Tokunaga, 1993). Such psychological characteristics may translate into a preference for luxury commodities.

Because income effects have been widely studied in the consumer demand literature (e.g., Pollak & Wales, 1992), this study will focus on the second effect, namely, that borrowers and nonborrowers have different preferences beyond what is captured in traditional preference shifters. To control for the income effect of borrowing, total expenditure (as a proxy for permanent income) will be controlled in this study. In addition, for borrowing status to be a good indicator of time preference, other factors affecting borrowing status should also be controlled. The life cycle savings hypothesis and permanent-income hypothesis (Ando & Modigliani, 1963; Friedman, 1957) suggest that in addition to time preference, total lifetime income, life cycle stage, the market interest rate, and supply-side constraints (liquidity constraints) are important factors affecting borrowing and saving. Human capital theory (Becker, 1975) suggests that education, employment status, and occupation are good indicators of lifetime income and that age and family status are good indicators of life cycle stage. These variables will also be controlled in this study. Furthermore, because this study uses cross-sectional data, commodity prices and market interest rates are assumed to be constant across households. Regional differences in prices may be captured by location variables. However, an explicit measure of supply-side liquidity constraints is difficult to obtain, although it is well-known that younger and lower income households are more likely to be liquidity constrained. It is hoped that the control of the age and income variables will capture some of the effect of supply-side constraints.

By incorporating the above considerations and adding a stochastic error term, Equation (1) is rewritten as

$$W_i = w_i(M, B, D) + \varepsilon_i, \quad (2)$$

where M is permanent income, B a variable indicating borrowing status, and D a vector of demographic variables including age, gender, ethnicity, family composition, education, employment status, occupation, and region. In addition, a housing tenure status variable is also included to capture possible variations in market interest rates and liquidity constraints.

The main theoretical hypothesis is that holding permanent income, prices, and other conventionally used preference shifters (including human capital and life cycle stage variables) constant, borrowers spend money differently than nonborrowers. Building on past

psychological literature, it is further hypothesized that borrowers spend more money on luxury commodities with income elasticities greater than one and, by the virtue of budget constraint, spend less money on necessities with income elasticities smaller than one, holding permanent income and other demographic variables constant.

One issue that needs to be addressed is whether consumer borrowing (intertemporal allocation) and consumer budget allocation (intra-temporal allocation) are simultaneously determined. A common neoclassical assumption is that intra-temporal allocation is weakly separable from intertemporal allocation (Deaton & Muellbauer, 1980). Thus, the majority of research on consumer demand has used permanent income as an exogenous budget constraint (e.g., Pollak & Wales, 1992). Consistent with consumer demand research, in the literature on consumer borrowing, consumer expenditure patterns have not been used as determinants to explain consumer borrowing (e.g., Cameron & Golby, 1991). Unfortunately, it is difficult to test this separability assumption for this particular research. Neither of the two available specification tests, Hausman's full information specification test (Hausman, 1978) and the Spencer-and-Berk limited information specification test (Spencer & Berk, 1981), applies in this case.² Because no formal test is available in this particular situation, the standard theoretical assumption that intertemporal allocation and intra-temporal allocation are separable is followed. This assumption also allows for the avoidance of further empirical complications that can introduce measurement errors.³

DATA AND SAMPLE SELECTION

The data used for this study consist of the interview survey portion of the 1994 and 1995 Consumer Expenditure Survey (CE) (U.S. Bureau of Labor Statistics [BLS], 1994, 1995). The CE data set, collected and published by the BLS, is the most comprehensive source of detailed information on family expenditure, income, and other socioeconomic and demographic characteristics of the U.S. population. The CE is conducted quarterly with rotating panels of approximately 5,000 families, who are interviewed for five consecutive quarters. One fifth of the sample is new each quarter.

For this study, only consumer units (CUs) that have completed interviews for four quarters during 1994, 1995, or the first quarter of

1996 are included in the sample. There are six panels of respondents included in this study. The first panel was interviewed between the first quarter of 1994 and the last quarter of 1994. The second panel was interviewed between the second quarter of 1994 and the first quarter of 1995. The last panel was interviewed between the second quarter of 1995 and the first quarter of 1996. The number of households satisfying these criteria is 5,687. In addition, the after-tax income variable is top-coded for CUs with very high income. Because consumers with very high income tend to be outliers in their expenditure patterns and have disproportional influence on the regression analyses, 80 households with top-coded income are excluded from the sample. Furthermore, because people who are self-employed tend to have complicated borrowing patterns mixing business and personal borrowing, households with a self-employed reference person or spouse are excluded from the sample. In addition, people who are in the armed forces are excluded from the sample because they tend to face different market prices than those who are not. The resulting sample size is 5,174,⁴ with about 850 households from each of the six panels.

For a CU to be classified as a nonborrower,⁵ it should not have any of the following forms of debt during the reference period: (a) home equity loans; (b) car loans (including leased cars); (c) interest-paying credit card loan; (d) interest-paying store installment loans; (d) loans from banks, Savings and Loans, credit unions, finance companies, and insurance companies; (e) loans from doctors, dentists, hospitals, or other medical practitioners for expenses not covered by insurance; and (f) loans from other credit sources not mentioned above (excluding mortgage). Using this definition, 2,046 CUs in the sample (39.54%) are classified as nonborrowers.

Two definitions of borrowing are used in this study. With the broad definition, CUs carrying any of the above-mentioned debt (other than mortgage) are considered borrowers. The number of borrowers is 3,128 CUs according to the broad definition of borrowing. With the strict definition, borrowers are defined as those CUs who have paid interest payment on credit cards during the reference year. For this sample, 1,943 CUs are classified as borrowers, about 37.55% of the sample CUs.⁶ Note that the 1,943 CUs classified as "strict borrowers" are included in the 3,128 CUs classified as "borrowers" according to the broad definition.

The decision on commodity aggregation is always a challenge in studies on expenditure patterns. If too many expenditure categories are included, then there is a danger of not being able to see the forest

METHOD AND MEASUREMENTS

The D vector in Equation (2) includes the following measurements:

Education: Education is coded into three categories: less than high school, high school graduates, and more than high school. For married families, education is coded as the education level of the spouse who has a higher educational attainment.

Race/ethnicity: Race/ethnicity is coded as the race/ethnicity of the reference person. Four categories are possible: Caucasian American, African American, Hispanic American, and other race/ethnicity.

Family type: Four categories are included: husband-wife family, single female head, single male head, and other family.

Family size: Family size includes the total number of adults older than 17 and total number of children age 17 or younger. This variable, combined with the family-type variable, should provide a good picture of family structure.

Occupation and employment: For dual-income husband-and-wife families, occupation is coded as the occupation of the spouse with a higher educational attainment. If the educational attainment is the same for both spouses, then the occupation of the reference person is used. For one-income husband-and-wife families, the occupation of the working spouse is used. For all other types of families, the occupation of the reference person is used. Five occupational categories are included: administration, other white-collar occupations, blue-collar occupations, retired, and not working.

Housing tenure: Three categories are included for this variable: renter, homeowner with mortgage, and homeowner without mortgage. Because homeowners usually can borrow home equity loans, which have a lower interest rate than other types of loans, such as credit card loans, this variable is included to capture possible differences in available market interest rates and liquidity constraints.

Region: Five categories are included for this variable: urban Northeast, urban Midwest, urban South, urban West, and rural. This variable should help capturing some regional differences in prices.

To test the hypotheses proposed in the previous section empirically, a functional form needs to be specified for the demand equations. For the sake of simplicity, the functional form chosen for this study is a reduced Quadratic Expenditure System (QES) with demographic translating (Pollak & Wales, 1992). Because this study uses cross-sectional data, prices are assumed to be constant. With conventional preference variables incorporated, and the borrowing variable B interacted with all other variables, the functional form can be written as

$$W_i = \alpha_i + \beta^M_i M + \beta^{M^2}_i M^2 + \beta^D_i D + \gamma^B_i B + \gamma^{BM}_i B^* M + \gamma^{BM^2}_i B^* M^2 + \gamma^{BD}_i B^* D + \varepsilon_i \quad (3)$$

where α s, β s, and γ s are parameters. Budget shares are used as dependent variables to correct for heteroskedasticity problems commonly found in demand equations using expenditures as dependent

variables (Maddala, 1992). The following adding-up restrictions can be imposed:

$$\begin{aligned}\sum_{i=1}^{24} \alpha_i &= 1, \\ \sum_{i=1}^{24} \beta_i &= 0 \text{ for all } \beta_s, \\ \sum_{i=1}^{24} \gamma_i &= 0 \text{ for all } \gamma_s.\end{aligned}\tag{4}$$

Many of the expenditure categories included in this study have a large number of zero expenditure observations. To correct for this limited dependent variable problem, a two-stage Tobit method is used (Fan, 1997; Greene, 1990; Maddala, 1983) for any expenditure categories with more than 10% zero observations.⁸ Specifically, probit models are estimated first with the probability of nonzero expenditure on relevant categories as the dependent variables:

$$\begin{aligned}\text{Prob}(W_i > 0) &= \tau_{0i} + \tau_{1i}M + \tau_{2i}M^2 + \tau_{3i}D \\ &+ \tau_{4i}B + \tau_{5i}B^*M + \tau_{6i}B^*M^2 + \tau_{7i}B^*D + \varepsilon_{iv}\end{aligned}\tag{5}$$

where the τ s are probit equation parameters. The probit estimates are then used to compute a sample-selection bias correction term to be included in the second-stage regression analysis, and Equation (3) becomes

$$\begin{aligned}W_i &= \alpha_i + \beta^M_i M + \beta^{M^2}_i M^2 + \beta^D_i D + \gamma^B_i B + \gamma^{BM}_i B^*M \\ &+ \gamma^{BM^2}_i B^*M^2 + \gamma^{BD}_i B^*D + \sigma_i [\phi_i - (1 - \Phi_i) (\tau_{0i} + \tau_{1i}M \\ &+ \tau_{2i}M^2 + \tau_{3i}D + \tau_{4i}B + \tau_{5i}B^*M + \tau_{6i}B^*M^2 + \tau_{7i}B^*D)] + \varepsilon_{iv}\end{aligned}\tag{6}$$

where ϕ_i is the density function of the standard normal distribution evaluated at $\tau_i(M, P, D)$ for commodity i , and Φ_i is the cumulative probability function of the standard normal distribution evaluated at $\tau_i(M, B, D)$ for commodity i . In addition, σ is a parameter for the sample-selection bias correction term.⁹

Sixteen expenditure categories need correction for limited dependent variable problems: household operations, household equipment and furnishing, medical services, prescription drugs/medical

supplies, health insurance, car purchases, out-of-town public transportation, local public transportation, vacation housing/hotel lodging, reading, education, alcoholic beverages, tobacco, miscellaneous, cash contributions, and personal insurance/pensions.

The error terms in the demand equation system are assumed to be correlated. The system is estimated using an iterated seeming unrelated regression method with the SAS PROC MODEL procedure. To test whether borrowers and nonborrowers allocate their money differently, a second system is estimated with all the γ s restricted to be zero. F tests are then conducted to test the joint significance of the borrowing variables.

To quantitatively assess the average differences between borrowers and nonborrowers, the regression estimation results are used to simulate the borrowers' budget shares as if they were not borrowers without changing any other of their characteristics, including total expenditure. The simulated budget shares are then compared with borrowers' actual budget shares.

Weights are used to reflect the total population under study. The weights are calculated by the BLS and are used to compute all means, standard errors, frequencies, and regression results.¹⁰

DESCRIPTIVE STATISTICS

Among borrowers who have credit card debt, more than half (56.15%) also have one or more car loans (or lease one or more cars), one third of them (33.21%) have one or more other types of bank loans, 12.34% of them have one or more home equity loans, and 2.11% of them also have paid interest charges to physicians' bills. For the broadly defined borrowing group, 60.97% of the borrowers carry credit card debt, 65.91% have one or more car loans (or lease one or more cars), 27.64% have one or more other types of bank loans, 12.64% have one or more home equity loans, and about 2.09% have paid interest charges on physicians' bills. Table 1 presents the demographic profiles of borrowers and nonborrowers. The profiles look remarkably similar for borrowers defined by the strict credit card debt definition and borrowers defined by the broad debt definition. On average, borrowers spend about two thirds more annually than nonborrowers. Borrowers also have a higher after-tax income than nonborrowers. Compared with nonborrowers, borrowers are younger and better educated. The proportion of borrowers is higher among Caucasian

TABLE 1: Weighted Sample Demographic Characteristics by Borrowing Status

Variable	Nonborrowers n = 2,046	Credit Card Borrowers n = 1,943	All Borrowers n = 3,128
Total expenditure (\$)	23,380.61 (19,738.44)	39,765.59 (23,657.54)	38,298.44 (23,323.92)
Age	58.06 (18.76)	45.53 (13.90)	45.56 (14.05)
Race/ethnicity (%)			
Non-Hispanic Caucasian (base)	75.15	82.80	81.65
Non-Hispanic Afro-American	12.77	8.76	9.78
Hispanic American	8.03	6.42	6.38
Others	3.05	2.02	2.19
Education (%)			
Less than high school	28.15	7.90	9.91
High school graduates (base)	49.99	57.24	58.08
More than high school	21.86	34.86	32.01
Family type (%)			
Husband-wife family (base)	31.35	53.21	52.49
Single female family	39.06	22.08	22.30
Single male family	17.83	13.18	12.87
Other family	11.76	11.53	12.34
Family size			
Number of adults older than 17 years	1.68 (0.77)	1.99 (0.79)	2.01 (0.80)
Number of children younger than 18 years	0.49 (1.04)	0.83 (1.10)	0.83 (1.12)
Occupation (%)			
Administration (base)	4.58	10.97	10.08
Other white-collar	19.19	45.96	42.77
Blue-collar	19.85	28.63	30.76
Retired	39.71	8.73	9.46
Not working	16.67	5.71	6.93
Number of earners	0.79 (0.95)	1.67 (0.91)	1.65 (0.91)
Housing tenure (%)			
Renters (base)	35.95	22.89	24.64
Owner with mortgage	18.88	58.44	54.50
Owner without mortgage	45.17	18.67	20.86
Region and rural/urban (%)			
Urban Northeast (base)	21.60	21.90	17.45
Urban Midwest	20.41	20.77	21.92
Urban South	25.34	28.52	28.13
Urban West	18.30	18.03	16.32
Rural	14.35	10.78	16.18

NOTE: For continuous variables, both means and standard deviations (in parentheses) are reported. For discrete variables, frequencies are reported.

households than among minority groups, among married families than among other types of families, among consumers who are working than among consumers who are either retired or not working, and among homeowners with mortgages than among renters or homeowners without mortgages. In addition, borrowers also have a larger average family size and more earners per household compared with nonborrowers.

The means and standard deviations for expenditures and budget shares for all expenditure categories included in this study are presented in Table 2, together with the results of two-sample *t* tests. Borrowers' budget shares are significantly different from nonborrowers' in 20 out of the 24 expenditure categories, for both definitions of borrowers. On average, compared with nonborrowers, borrowers allocate more of their budget to household furnishings and equipment, car purchases, gasoline and car maintenance, entertainment, food away from home, education, alcoholic beverages, personal insurance and pensions, and miscellaneous. Borrowers allocate less of their budget to food at home, shelter, utilities, prescription drugs and medical supplies, health insurance, personal care, public transportation (both out-of-town and local), and cash contributions. The credit card debt group is also found to spend less of their budget on tobacco than nonborrowers, whereas borrowers defined by using the broad definition are found to spend less of their budget on reading than nonborrowers.

RESULTS AND DISCUSSIONS

Goodness-of-Fit Measures

The R^2 s for the regression equations vary considerably across expenditure categories. The adjusted R^2 s range from .02 (medical services for all borrowers compared with nonborrowers) to .53 (food at home for credit card borrowers compared with nonborrowers). The expenditure categories with R^2 s higher than .30 include food at home, shelter, utilities, health insurance, and cash contributions. Models with R^2 s lower than .10 include household operations, household furnishings and equipment, medical services, out-of-town public transportation, entertainment, vacation house and hotel, education, and miscellaneous.

TABLE 2: Mean Budget Shares by Borrowing Status (two-sample *t*-test statistics in parentheses)

Expenditure Categories (%)	Nonborrower	Borrower (Strict)	Borrower (Broad)
Food at home	16.98	10.78 (22.98***)	11.27 (22.00***)
Primary housing-related services			
Shelter	19.61	16.56 (8.17***)	16.11 (9.86***)
Utilities	10.75	7.39 (18.74***)	7.82 (17.14***)
Household operations	1.31	1.26 (0.06)	1.21 (0.56)
Furnishings/equipment	2.42	3.17 (-5.99***)	2.99 (-5.11***)
Apparel	3.49	4.24 (-7.60***)	4.09 (-6.69***)
Health/personal care			
Medical services	1.76	1.61 (0.74)	1.64 (0.86)
Prescription drugs/supplies	1.75	0.90 (9.16***)	0.91 (9.42***)
Health insurance	5.10	2.63 (15.99***)	2.70 (16.41***)
Personal care	1.06	0.83 (7.50***)	0.84 (7.73***)
Transportation			
Car purchases	4.91	11.78 (-18.20***)	13.01 (-24.26***)
Gasoline/maintenance	4.82	5.69 (-7.61***)	5.74 (-8.36***)
Out-of-town public transportation	0.94	0.69 (3.03***)	0.68 (3.18***)
Local public transportation	0.37	0.14 (8.09***)	0.13 (8.80***)
Recreation-related expenditures			
Entertainment	3.67	4.89 (-10.31***)	4.67 (-10.01***)
Food away from home	3.29	3.75 (-4.07***)	3.66 (-3.77***)
Vacation house/hotel	0.79	0.84 (-0.83)	0.81 (-1.02)
Reading	0.58	0.56 (1.18)	0.52 (3.54***)
Other expenditures			
Education	0.56	1.06 (-5.16***)	0.91 (-4.37***)
Alcoholic beverages	0.73	0.83 (-2.33**)	0.81 (-2.21**)
Tobacco	1.14	1.01 (2.17**)	1.10 (0.88)
Cash contributions	2.30	2.01 (3.00***)	1.91 (3.64***)
Personal insurance/pensions	5.22	10.03 (-21.22***)	9.79 (-21.97***)
Miscellaneous	1.28	2.84 (-12.31***)	2.40 (-9.72***)

NOTE: All budget shares are percentage numbers. The *t* values in column 3 are comparisons between borrowers defined by the strict definition (have credit card borrowing) and nonborrowers. The *t* values in column 4 are comparisons between borrowers defined by the broad definition (any borrowing other than mortgage) and nonborrowers. **Statistically significant at the 95% level. ***Statistically significant at the 99% level.

Table 3 presents the results of the simulation analysis and the joint *F* tests for both definitions of borrowing. For the comparison between nonborrowers and credit card borrowers, budget shares of 22 out of the 24 expenditure categories are found to be statistically significantly different between these two groups. The simulation shows that if

TABLE 3: Actual and Simulated Average Adjusted Budget Shares for Borrowers and F-Test Results—Controlling for Permanent Income and Other Demographic Variables

Expenditure Category	Credit Card Borrowers Only				All Borrowers		
	Borrower Actual	If Nonborrower	F Statistic		Borrower Actual	If Nonborrower	F Statistic
Food at home	10.78	11.71	17.70***		11.27	12.37	23.92***
Primary housing services							
Shelter	16.56	18.37	4.74***		16.11	18.30	6.67***
Utilities	7.39	7.63	11.27***		7.82	7.94	10.83***
Household operations	1.26	1.38	1.79***		1.21	1.32	2.24***
Furnishings/equipment	3.17	3.01	1.59**		2.99	2.98	1.29
Apparel	4.24	4.41	3.87***		4.09	4.38	3.53***
Health/personal care							
Medical services	1.61	1.71	1.73**		1.64	1.68	1.39*
Drugs/medical supplies	0.90	0.67	2.24***		0.91	0.74	3.00***
Health insurance	2.63	2.00	5.01***		2.70	2.13	5.95***
Personal care	0.83	0.90	1.32		0.84	0.91	1.49*
Transportation							
Car purchases	11.78	6.95	8.21***		13.01	6.91	10.78***
Gasoline/maintenance	5.69	5.39	4.18***		5.74	5.45	5.03***
Out-of-town public transportation	0.69	1.18	3.65***		0.68	1.12	4.19***
Local public transportation	0.14	0.24	4.01***		0.13	0.26	7.89***

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Recreation expenditures						
Entertainment	4.89	4.61	2.69***	4.67	4.54	1.74**
Food away from home	3.75	4.07	2.79***	3.66	4.00	3.54***
Vacation house/hotel	0.84	1.22	2.61***	0.81	1.17	3.08***
Reading	0.56	0.50	1.94***	0.52	0.49	1.35
Other expenditures						
Education	1.06	1.23	1.32	0.91	1.20	1.70**
Alcoholic beverages	0.83	0.90	1.38*	0.81	0.90	1.37
Tobacco	1.01	0.96	2.33***	1.10	1.02	1.94***
Cash contributions	2.01	2.98	6.35***	1.91	2.85	6.35***
Personal insurance/pensions	10.03	9.84	3.24***	9.79	9.54	3.43***
Miscellaneous	2.84	1.44	7.83***	2.40	1.42	7.05***

NOTE: All budget shares are percentage numbers. The full-interaction F -tests control for permanent income and all other demographic variables listed in the Variable section.

*Statistically significant at the 90% level. **Statistically significant at the 95% level. ***Statistically significant at the 99% level.

these credit card borrowers in the sample were not borrowers, they would have allocated their money differently. Holding total expenditure and other demographic variables equal, compared with nonborrowers, borrowers on average allocate more money to 10 of the 24 expenditure categories: household furnishings and equipment, prescription drugs and medical supplies, health insurance, car purchases, gasoline and vehicle maintenance, reading, entertainment, tobacco, personal insurance and pensions, and miscellaneous. At the same time, borrowers spend less on 12 of the expenditure categories: food at home, shelter, utilities, household operations, apparel, medical services, out-of-town public transportation, local public transportation, food away from home, vacation house and/or hotel, alcohol beverages, and cash contributions. These differences are essentially the same between nonborrowers and borrowers defined with the broad definition, except that the budget share differences between borrowers and nonborrowers on household furnishings and equipment and reading become statistically insignificant at the 90% confidence level. In addition, the differences in education and personal care become statistically significant at the 90% confidence level. However, judging from the F statistics, the differences in the p values are rather small. Directions of the differences are consistent between these two analyses.

Because the regression results using the strict borrowing definition are very similar to the results using the broad borrowing definition, the discussion of the results is focused on the comparison between the broadly defined group of borrowers and nonborrowers. In Table 4, the estimated income elasticities for nonborrowers, borrowers defined with the broad definition, and for borrowers simulated as nonborrowers are presented. Commodity groups with income elasticities higher than one for both groups include household operations, household furnishings and equipment, car purchases, out-of-town public transportation, vacation house/lodging, education, and cash contributions. Commodity groups with income elasticities higher than one for the nonborrowers but not for the borrowers include apparel, medical services, food away from home, alcoholic beverages, personal insurance and pensions, and miscellaneous. Commodity groups that are necessities are food at home, shelter, utilities, prescription drugs, health insurance, personal care, gasoline and vehicle maintenance, reading, and tobacco. The income elasticity of local public transportation is almost unitary. Selected regression results using the broad borrowing definition are presented from Table 5 to

TABLE 4: Average Income Elasticities by Borrowing Status—Actual and Simulated

<i>Expenditure Category</i>	<i>Nonborrowers Actual</i>	<i>Borrowers Actual</i>	<i>Borrowers as Nonborrowers</i>
Food at home ^a	0.36	0.27	-0.11
Primary housing services			
Shelter ^a	0.67	0.71	0.54
Utilities ^a	0.35	0.26	-0.17
Household operations ^a	1.41	1.25	1.64
Furnishings/equipment ^a	1.23	1.11	1.22
Apparel ^a	1.20	0.98	1.18
Health/personal care			
Medical services ^a	1.30	0.99	1.34
Drugs/medical supplies	0.82	0.37	0.71
Health insurance ^a	0.40	0.26	0.12
Personal care	0.76	0.66	0.58
Transportation			
Car purchases ^a	1.89	1.79	1.95
Gasoline/maintenance	0.65	0.56	0.57
Out-of-town public transportation ^a	1.55	1.45	1.87
Local public transportation	1.04	1.01	1.03
Recreation expenditures			
Entertainment ^a	1.13	1.10	1.13
Food away from home ^a	1.22	0.93	1.21
Vacation house/hotel ^a	1.64	1.45	1.92
Reading	0.81	0.70	0.59
Other expenditures			
Education	1.35	1.45	1.52
Alcoholic beverages ^a	1.24	0.74	1.22
Tobacco ^a	0.47	0.25	0.13
Cash contributions ^a	2.16	2.54	2.82
Personal insurance/pensions ^a	1.41	0.90	1.22
Miscellaneous ^a	1.68	0.98	1.75

a. Parameters on total expenditure differ significantly between borrowers and nonborrowers. See Tables 5 to 10 for details.

Table 10. Additional results of the statistical analysis are available from the author upon request.

Food at home. On average, borrowers allocate less money to food at home than otherwise similar nonborrowers with the same total expenditure. The percentage difference in budget share is about 9.76%. Because food at home is a necessity, this result is consistent

TABLE 5: Selected Regression Results for Food at Home, Apparel, Alcoholic Beverages, and Tobacco

Variable	Food at Home		Apparel		Alcoholic Beverages		Tobacco	
	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions
Intercept	17.58**	-5.92***	5.92***		1.67***		-0.52	1.10*
Total expenditure (\$10,000)	-4.57***	2.40***	0.44***	-0.45***	0.09**	-0.15***	-0.35***	0.10*
Total expenditure squared	-0.18***	-0.12***	-0.03***	0.02***	-0.01**	0.01***	0.01***	-0.01**
Age (10 years)	2.39***		-0.56**	0.59*	-0.16		1.16***	-0.58**
Age squared	-0.27***		0.02		-0.00		-0.12***	0.06***
Race/ethnicity (Caucasian)								
Afro-American	3.21***	-3.47***	0.84***		-0.06		-0.54***	
Hispanic American	0.46		0.87***		-0.44***	0.35**	-1.21***	
Others	1.07	-2.17*	-0.50		-0.43**		-0.66***	
Education (high school)								
Less than high school	2.14***		-0.24		-0.07		0.34***	
More than high school	0.03		0.00		-0.17*		-0.25**	-0.26*
Family type (husband-wife family)								
Single female head	-0.48	-1.32***	0.44*		-0.10		-0.41***	
Single male head	-2.06***		-0.38		0.78***		0.44***	-0.45**
Other family	1.87***		-0.62**		-0.13	0.31*	0.43**	
Family size								
Number of adults older than 17 years	1.76***		-0.13		0.02		0.12	
Number of children younger than 18 years	2.14***	-0.67***	0.46***	-0.18**	-0.19***		-0.02	

with the hypothesis that borrowers allocate less money on necessities than nonborrowers. The regression coefficients in Table 5 show that borrowers, in comparison with nonborrowers, have a smaller intercept for the budget share for food. Food budget share decreases as total expenditure increases for both borrowers and nonborrowers. However, the budget decrease is at a faster rate for nonborrowers than for borrowers. The marginal effect of having a child in the CU on budget share for food at home is positive for both, but the size of the effect is larger for nonborrowers than for borrowers. Compared with CUs with the main income earner whose occupation is administration, retired CUs that do not borrow have a higher food-at-home budget share, whereas retired CUs that borrow have lower food-at-home budget shares. Consumers who do not work allocate more of their budget to food at home compared with consumers whose occupation is administration. That difference, however, is larger for nonborrowers than for borrowers, *ceteris paribus*.

Primary housing services. Household operations and household furnishings and equipment are generally considered luxury commodities, whereas shelter and utilities are considered necessities. It is found that on average, borrowers allocate less of their budget to shelter, utilities, and household operations than nonborrowers. The percentage differences are 13.59%, 1.53%, and 9.09%, respectively. However, borrowers allocate more of their budget to household furnishings and equipment than nonborrowers, although that difference is slightly short of being 90% significant for the borrowers defined broadly. The result that borrowers spend less on household operations contradicts the hypothesis that borrowers spend more on luxury commodities. The finding that borrowers spend less on shelter and utilities and more on household furnishings and equipment is consistent with the hypothesis that borrowers allocate less money to necessities.

A lower budget share for household operations for borrowers seems to be caused by a smaller positive marginal effect of total expenditure for borrowers than for nonborrowers (Table 6). It may be because household operations, which include child care, housekeeping, care for invalids or the elderly, gardening/lawn care, water softening, nonclothing laundry, and so forth, do not have an obvious social display function unless the consumer can afford to hire in-house housekeepers and gardeners, which is not easily affordable for the average American household. It is also found that borrowers are

less income elastic than nonborrowers on expenditure on household operation, holding other things equal (Table 4).

Apparel. Apparel is usually considered to be a luxury commodity (Fan, Lee, & Hanna, 1998). The results in this study show that whereas apparel is a luxury commodity among nonborrowers, it is about unitary income elastic among borrowers (Table 4). It is also found that borrowers spend less of their budget on apparel than nonborrowers. The simulation results in Table 3 show that the percentage difference in budget share is about 7.09%.

The regression coefficients in Table 5 show that in the relevant total expenditure region, there is a large positive marginal effect of total expenditure on budget share for apparel for nonborrowers. However, for borrowers, the marginal effect of total expenditure is slightly negative.

Health and personal care. Due to the complexity of the health care system and the nature of medical care, it is difficult to classify out-of-pocket health care expenditures into either the necessity group or the luxury group. Out-of-pocket health insurance expenditure is likely to be job related, with higher paying white-collar jobs more likely to come with health care benefits and thus lower out-of-pocket expenditure from the consumer than lower paying blue-collar jobs. Expenditures on medical services and prescription drugs are determined both by the health insurance coverage and one's health condition. Estimates in this study show that prescription drugs/medical supplies, health insurance, and personal care have income elasticities lower than one for both groups. For medical services, the income elasticity is higher than one for nonborrowers but almost one for borrowers.

Simulations presented in Table 3 show that borrowers spend more on health insurance (26.76% difference) and prescription drugs and medical supplies (22.97% difference) than nonborrowers on average, other things being equal. Borrowers spend slightly less on medical services than nonborrowers (2.44% difference) and personal care (8.33% difference).

Selected regression results for medical expenses and personal care are presented in Table 7. For out-of-pocket health insurance expenditure, the marginal effect of total expenditure is negative in the relevant

(text continues on p. 384)

TABLE 6: Selected Regression Results for Housing-Related Expenditures

Variable	Shelter		Utilities		Household Operations		Household Equipment	
	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions
Intercept	36.00***	-6.69**	11.00***		3.73***		2.01**	
Total expenditure (\$10,000)	2.45***	1.26***	-2.98***	1.45***	0.38***	-0.26***	0.37***	-0.23**
Total expenditure squared	0.08***	-0.05***	0.11***	-0.07***	-0.02	0.01***	-0.02***	0.02***
Age (10 years)	-0.52		-0.10		-1.77***	0.58*	0.57*	
Age squared	0.08		0.02		0.18***	-0.07**	-0.07***	
Race/ethnicity (Caucasian)								
Afro-American	-0.93		2.51***	-1.34***	-0.27		-0.09	
Hispanic American	1.10		-0.29		-0.24		-0.14	
Others	1.84		0.36		-0.25		-0.13	
Education (high school)								
Less than high school	-1.20**		0.86***		-0.42***		0.06	
More than high school	2.22***		-0.18		0.14		0.06	
Family type (husband-wife family)								
Single female head	2.25***		0.80**		0.72**	-0.63**	-0.87***	-0.63**
Single male head	1.22		-0.55		-0.12		-0.89***	
Other family	-0.56		0.43		-0.42		0.39	
Family size								
Number of adults older than 17 years	0.29		0.60***		-0.12		-0.36*	
Number of children younger than 18 years	-0.69***	0.71**	0.53***	-0.24*	0.24***	0.21**	-0.02	0.21**

Occupation (administration)					
Other white-collar	-1.01	0.61	0.17	-0.71*	
Blue-collar	0.45	0.22	0.06	-0.66	
Retired	-0.74	-0.17	-0.17	-0.12	
Not working	-0.78	1.31**	-0.18	-0.27	
Number of earners	-0.42	0.05	-0.11	-0.11	
Housing tenure (renters)					
Owner with mortgage	-3.72***	1.99**	0.45**	0.69***	
Owner without mortgage	-16.41***	4.57***	0.71***	0.52**	
Region (urban Northeast)					
Urban Midwest	-5.12***	-0.06	-0.05	0.76***	
Urban South	-5.52***	0.69**	0.59***	0.09	
Urban West	-1.23*	-0.62**	0.74***	0.24	
Rural	-6.98***	0.76**	-0.21	0.17	
Selection bias correction			0.00**	0.00***	
Adjusted R^2	.38	.45	.08	.03	

*Statistically significant at the 90% level. **Statistically significant at the 95% level. ***Statistically significant at the 99% level.

TABLE 7: Selected Regression Results for Medical Expenses and Personal Care

Variable	Medical Services		Prescription Drugs		Health Insurance		Personal Care	
	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions
Intercept	0.26		-0.49	2.11***	7.46***		1.42***	
Total expenditure (\$10,000)	0.33***	-0.31**	-0.12**		-1.16***	0.73***	-0.09***	
Total expenditure squared	-0.02***	0.02***	0.00		0.04***	-0.03***	0.00	
Age (10 years)	-0.14		0.28	-0.83***	-1.63***		-0.12	
Age squared	0.03		0.01	0.08***	0.26***		0.01**	
Race/ethnicity (Caucasian)								
Afro-American	-0.38		-0.85***		-1.24	0.84**	0.53***	
Hispanic American	0.82**	-1.40***	-0.74***		-0.43		0.14*	
Others	-0.40		-0.19		-0.30		0.05	
Education (high school)								
Less than high school	-0.18		0.78***	-1.00***	0.51**	-0.55*	-0.09*	
More than high school	0.03		-0.38**	0.42**	0.04		0.19***	
Family type (husband-wife family)								-0.13*
Single female head	-0.18		-0.40**		-1.41***	0.64*	0.05	
Single male head	0.02		-0.78***		-1.63***		-0.44***	
Other family	0.04		0.29		0.78**	-0.73*	0.02	
Family size								
Number of adults older than 17 years	-0.34*		0.21		0.18		0.03	
Number of children younger than 18 years	0.22**		-0.08		-0.09	0.29**	-0.02	

total expenditure region for both borrowers and nonborrowers. However, the size of the marginal effect is much larger for nonborrowers than for borrowers. For the budget share on medical services, the marginal effect of total expenditure is positive in the relevant total expenditure region for both, yet the size of the effect is also larger for nonborrowers than for borrowers. It seems that borrowers are less total expenditure elastic with respect to budget share for health insurance and medical services. Because no information on health status is available in the CE data, one possible explanation is that the average health condition may be different between borrowers and nonborrowers. This explanation of poor health conditions of the debtors is grounded in past research on personal bankruptcy, which cited medical conditions and thus large medical debt as a major reason for some consumers' filing for personal bankruptcy (Sullivan, Warren, & Westbrook, 1989). Consumers with poor health may decide to purchase more insurance coverage than consumers with good health. It is also possible that they are charged a higher insurance premium for buying the same coverage. In addition, some medical expenses may not be covered even by extended health insurance plans, and therefore more money needs to be allocated to prescription drugs and medical equipment.

Transportation. Four categories are included in transportation. Two categories are private transportation: car purchases and gasoline and vehicle maintenance. Two other categories are public transportation: out-of-town and local. Car purchases and out-of-town public transportation are generally considered luxury commodities. Expenditure on local public transportation does not seem to be affected by the level of total expenditure, as such expenditure is likely to be constrained by the availability of public transportation.

The simulation results in Table 3 show that borrowers spend much more money on car purchases than nonborrowers, holding other things equal. The difference is as large as 88.28% for the broadly defined borrowing group and nonborrowers and is 69.50% for the credit card debt borrowing group and the nonborrowing group. This result strongly supports the hypothesis that borrowers allocate more money to luxury commodities. However, borrowers are found to allocate more money to buy gasoline and vehicle maintenance than nonborrowers, which is contradictory to the hypothesis that borrowers spend less on nonluxury commodities. In addition, borrowers are found to spend less of their money on out-of-town public

transportation, which is again contradictory to the hypothesis. Borrowers also spend less money on local public transportation than nonborrowers.

The result seems to support the idea that borrowers have a stronger preference for private transportation over public transportation, compared with otherwise similar nonborrowers. Because cars can be considered as a commodity representing status, such finding is consistent with the social display argument (Livingstone & Lunt, 1992a, 1992b). High expenditure on gasoline and vehicle maintenance may be an indication of the frequent use of private transportation. Because private transportation and public transportation are substitutes, it is understandable that expenditure on public transportation is lower for borrowers than for nonborrowers.

Selected regression results for transportation-related expenditure categories are presented in Table 8. It is interesting to note the large intercept (15.42%) for borrowers in the demand equation for car purchases. Total expenditure has a positive marginal effect on the budget share for car purchases in the relevant region for both borrowers and nonborrowers. However, the size of the effect is larger for borrowers than for nonborrowers, holding other things equal. The different effects of age on the budget share for car purchases for borrowers and nonborrowers are another interesting finding: Whereas expenditure on car purchases increases with age for relevant ages for nonborrowers, expenditure decreases with age for borrowers. This implies that younger borrowers are likely to spend more on car purchases than older borrowers, whereas the relationship is reversed for nonborrowers.

Recreation-related expenditures. Four categories of expenditures are included in this category: entertainment, food away from home, lodging, and reading. Entertainment and food away from home are commonly considered as luxury commodities. However, in this study, it is found that food away from home is only a luxury commodity for nonborrowers. For borrowers, food away from home is found to be unitary income elastic.

Vacation house and lodging is a luxury commodity for both groups, whereas reading is a necessity. Consistent with the hypothesis that borrowers spend more money on luxury commodities, the results in Table 3 show that borrowers spend more on entertainment than nonborrowers, a 2.86% difference, small but statistically significant in both sets of comparisons. However, borrowers are found to

TABLE 8: Selected Regression Results for Transportation-Related Expenditures

Variable	Car Purchases		Gas and Maintenance		Out-of-Town Public Transportation		Local Public Transportation	
	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions
Intercept	-3.36	18.78***	2.82***		-0.95*		0.12	
Total expenditure (\$10,000)	2.53***	0.71**	-0.71***		0.39***	-0.30***	-0.03	
Total expenditure squared	-0.11***		0.02***		-0.02***	0.02***	0.00	
Age (10 years)	1.35	-7.03***	1.02***		0.17		0.21***	
Age squared	-0.16**	0.55***	-0.14***		-0.01		-0.02***	
Race/ethnicity (Caucasian)								
Afro-American	-1.02		-1.12***	0.71**	-0.15		0.76***	-0.45***
Hispanic American	-1.62	2.66*	-0.19		0.02		0.62***	-0.53**
Others	-0.40		-0.77*		-0.47*	0.89**	0.44***	-0.42***
Education (high school)								
Less than high school	0.21		0.22		-0.18*		-0.05	
More than high school	-2.11***	-1.76**	-0.32		0.68***	-0.25*	0.06	
Family type (husband-wife family)								
Single female head	-0.38	2.39***	-1.55***		0.18		0.30***	-0.15*
Single male head	1.08		-0.57*	0.94***	-0.07		0.24***	
Other family	-0.69		0.06	0.74*	-0.24		-0.09	
Family size								
Number of adults older than 17 years	0.67		0.21		-0.08		0.18***	-0.11**
Number of children younger than 18 years	-0.39	-0.76**	-0.19**		-0.06		-0.04	

spend less on food away from home (9.29% difference). Borrowers are also found to spend less on vacation house and lodging, compared with otherwise similar nonborrowers (44.44% difference). Borrowers spend more on reading than nonborrowers, but that difference is only statistically significant at the 90% level for the comparison between nonborrowers and the credit card borrowers.

An investigation of the regression results presented in Table 9 reveals that whereas the budget share for food away from home increases with total expenditure for nonborrowers in the relevant total expenditure region, the relationship is reversed for the borrowers. Borrowers with higher total expenditure spend less of their total budget on food away from home compared with borrowers with lower total expenditure, holding other things equal. In addition, whereas age has a negative effect on budget share for food away from home for nonborrowers in the relevant total expenditure region, the effect is almost zero for borrowers.

Other expenditures. Borrowers spend more money on miscellaneous than otherwise similar nonborrowers (69.01% difference), which is not surprising because a major component of miscellaneous is financial and interest charges. Compared with nonborrowers, borrowers are found to spend less on education (31.87% difference) and cash contributions (49.21% difference) while spending more on tobacco (7.84% difference) and personal insurance and pensions (2.62% difference), *ceteris paribus*. Borrowers spend less on alcohol beverages than nonborrowers. That difference is statistically significant at 90% between credit card borrowers and nonborrowers. Between nonborrowers and borrowers, this difference is significant at slightly lower than the 90% confidence level.

Education and cash contributions are considered to be luxury commodities (Table 4). Contradictory to the hypothesis that borrowers spend more on luxury commodities, it is found that borrowers allocate less of their budget to these two expenditure categories than otherwise similar nonborrowers. It is possible that these two expenditure categories, although elastic to income changes, do not have obvious social display functions. The regression coefficients in Table 10 show that the difference on spending on education between borrowers and nonborrowers is mainly caused by borrowers living in the urban South and urban West spending less of their budget on education than nonborrowers in those areas. It is not clear why such regional differences exist. The regression results in Table 10 also show that

although the marginal effect of total expenditure on cash contributions is positive for both borrowers and nonborrowers in the relevant total expenditure region, the size of the effect is much smaller for borrowers than for nonborrowers, holding other things equal.

Because borrowers are more present oriented than nonborrowers, it is surprising that borrowers spend more on private insurance and pension than nonborrowers, on average. The regression coefficients in Table 10 show that borrowers have a smaller intercept for the demand equation for insurance and pensions. Borrowers also have a negative marginal effect of total expenditure on the budget share for insurance and pension. However, the positive marginal effect of age is much larger for borrowers (4.02% for every 10 years of age) than for nonborrowers (0.85% for every 10 years of age). Because a large portion of this expenditure category is private pension saving, it is possible that borrowers start retirement planning at a later age than nonborrowers and thus have to save more every year. This seems to suggest that borrowers have a shorter planning horizon than nonborrowers, which is consistent with the notion of borrowers being more present oriented.

The regression coefficients for alcoholic beverages and tobacco are presented in Table 5. The higher the total expenditure, the lower the budget share on tobacco, holding other things equal. However, the size of this effect is smaller for borrowers than for nonborrowers. On the other hand, the older a consumer is, the more the consumer spends on tobacco, and the size of this marginal effect is smaller for borrowers than for nonborrowers in the relevant age region.

CONCLUSION

The hypothesis that borrowers spend money differently than nonborrowers after adjusting for differences in permanent income and demographic characteristics is confirmed. Compared with otherwise similar nonborrowers with the same permanent income, borrowers spend more money on 10 out of the 24 expenditure categories, and they spend less money on 12 out of the 24 categories. In addition to the fact that borrowers spend more money paying finance and interest charges than nonborrowers, the differences between borrowers and nonborrowers can be summarized as follows:

(text continues on p. 394)

TABLE 9: Selected Regression Results for Recreational Expenditures

Variable	Entertainment		Food Away From Home		Lodging		Reading	
	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions
Intercept	5.48***		5.92***		0.26	-1.16*	5.44***	
Total expenditure (\$10,000)	0.37***		0.45***	-0.51***	0.32***	-0.21***	-0.04***	
Total expenditure squared	-0.02***	0.02***	-0.02***	0.02***	-0.01*		0.00	
Age (10 years)	-0.51	0.93**	-0.74***	0.82**	0.05	0.67***	0.04	
Age squared	0.00	-0.09*	0.03	-0.06*	-0.00	-0.07***	0.00	-0.01*
Race/ethnicity (Caucasian)								
Afro-American	-0.65**		-0.96***		0.07		-0.21***	
Hispanic American	-0.82**		-0.24		-0.37**	0.43*	-0.14***	
Others	-0.04		0.55		-0.44*		-0.01	
Education (high school)								
Less than high school	-0.72***		-0.57***		-0.38***		-0.13***	
More than high school	0.31		0.05		-0.01		0.18***	
Family type (husband-wife family)								
Single female head	-0.15		-0.33		-0.23		-0.01	
Single male head	0.74**		1.40***	-0.58*	-0.13		-0.03	
Other family	-0.45		-0.50*		-0.20		0.03	
Family size								
Number of adults older than 17 years	-0.24		-0.32*		0.08		-0.05	
Number of children younger than 18 years	-0.07		-0.32***		-0.11**		-0.01	

TABLE 10: Selected Regression Results for Other Expenditures

Variable	Education		Cash Contributions		Insurance/Pension		Miscellaneous	
	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions	Nonborrowers	Significant Interactions
Intercept	2.09***		1.39		6.12**		-0.38	2.42*
Total expenditure (\$10,000)	0.21***		1.64***		0.85***		0.48***	-0.49***
Total expenditure squared	-0.01		-0.03***	-0.76***	-0.04**	-1.03***	-0.02***	0.02***
Age (10 years)	-0.91***		-0.25	0.02***	0.97*	3.05***	-0.24	
Age squared	0.06***		0.05**		-0.12***	-0.30***	0.03	
Race/ethnicity (Caucasian)								
Afro-American	-0.17		0.08	0.61**	1.02**		-0.53*	0.98**
Hispanic American	-0.31		1.41***	-1.60***	-0.90		-0.56	
Others	1.10***	-0.95**	-0.62		2.10***	-1.89*	-0.55	
Education (high school)								
Less than high school	-0.09		-0.51***		0.89***	-1.31**	-0.04	
More than high school	0.34**		-0.37*	0.45*	0.86**		-0.36	
Family type (husband-wife family)								
Single female head	0.15	0.51*	0.84***	-0.57*	-1.71***		0.61**	
Single male head	0.11		0.46		-0.48		0.61*	
Other family	-0.19		-0.10		-0.18		0.06	
Family size								
Numbers of adults older than 17 years	0.21		-0.61***		-1.30***		0.39*	
Number of children younger than 18 years	-0.11		-0.19**		-0.59***		0.01	

1. Partially supporting the hypothesis that borrowers spend more money on luxury commodities, this study finds that borrowers spend more money on car purchases, entertainment, and household furnishings and equipment, holding other things equal. However, partially rejecting the same hypothesis, it is also found that borrowers spend less money on other luxury commodities such as out-of-town trips and vacation houses, on average.
2. It is also interesting to note that although apparel, medical services, alcoholic beverages, and food away from home are found to be luxury commodities for nonborrowers, they are found to be almost unitary income elastic for borrowers.
3. Supporting the hypothesis that borrowers spend less on necessities, it is found that borrowers, on average, spend less on shelter, food at home, and utilities than nonborrowers, holding other things equal.
4. On average, borrowers spend more money on health insurance and prescription drugs and medical equipment. This lends support to previous research findings that some consumers who file for bankruptcy borrow money because of poor health and therefore high medical expenses (Sullivan et al., 1989).
5. Borrowers spend less money on education and cash contributions than otherwise similar nonborrowers. However, the expenditures on personal insurance and pensions and tobacco are higher for borrowers than for nonborrowers, on average.
6. The two analyses—one compares nonborrowers with credit card borrowers only, the other compares nonborrowers with all borrowers—yield very similar results.

LIMITATIONS AND IMPLICATIONS

Before discussing the implications, the limitations of this study should be borne in mind when interpreting the findings. First, this study uses cross-sectional data so the classification of borrowers and nonborrowers is based on debt information during the reference year. It is possible that some consumers who are classified as borrowers in this study may not be borrowers in the past or in the future, and some consumers who are classified as nonborrowers in this study may be borrowers in the past or in the future. Second, instead of using the amount of debt, this study treats debt as a dichotomous variable, partly because of the practical difficulty of constructing a good continuous measure for the debt variable, and partly because of the assumption that borrowers and nonborrowers are qualitatively different. Nevertheless, some information is lost in this dichotomous measure. Third, a separability assumption between intertemporal

allocation and intratemporal allocation is made in this study, and no formal test is available for testing the validity of this assumption. If this assumption is violated, then the estimates are inconsistent.

Bearing these limitations in mind, the results of this study still have theoretical and practical implications. The findings and limitations of this study may also help provide directions for future research.

First, it is found that borrowing, commonly studied in research on intertemporal substitution (saving and borrowing) but not in research on consumer demand, is correlated with consumers' preferences regarding budget allocation within a certain period. However, the relationship is not simple. The linkage between theories on intertemporal substitution and on consumer demand should be explored in future research to further understand the formation and determinants of consumer preferences. Sociological and psychological theories should be incorporated into the development of such a theory. It is hoped that the results of this study can provide some basic information for future development of research in this area.

Second, it should be noted that although the average pattern of spending is used for discussion in this study, it is likely that in reality, borrowers can be classified into several groups, with some borrowing for the purpose of social display and others borrowing to cover expenditure on necessities. Future research should try to identify these different groups and study their patterns of borrowing and spending separately. For those borrowers who are in danger of financial trouble, different remedies should be provided depending on whether it is an issue of necessary needs or an issue of conspicuous consumption.

Third, to understand the trend of personal bankruptcy and consumer debt in the United States, future research should explore whether the numbers of consumers in some groups of borrowers are increasing over time, especially the group of borrowers borrowing for conspicuous consumption. Such a trend study may help understand the increasing number of personal bankruptcies despite a good overall economic environment.

Finally, it should be noted that both the demographic profiles and the expenditure patterns look very similar between credit card borrowers and all borrowers. This finding suggests the substitutability of different types of credit. For future research, it is perhaps more important to look at why people borrow rather than what type of debt they carry.

APPENDIX

TABLE A1: Definitions of Expenditure Categories

<i>Expenditure</i>	<i>Definition</i>
Food at home	Food and nonalcoholic beverages purchased and prepared by consumer unit (CU) on trips or purchased at grocery stores or convenience or specialty stores
Primary housing /services	
Shelter	Mortgage interest and property tax, rent, or rent as pay
Utilities	Natural gas, electricity, fuel oil, telephone, water, and other public services
Household operations	Housekeeping, gardening/lawn care, water softening, nonclothing laundry, care for invalids or elderly, termite/pest control, child care
Furnishings/equipment	Household textiles, furniture, floor coverings, appliances, small equipment
Apparel	Clothing and services, footwear, and services
Health/personal care	
Medical services	Out-of-pocket expenses for medical services
Prescription drugs/supplies	Out-of-pocket expenses for prescription drugs and medical supplies
Health insurance	Out-of-pocket expenses for health insurance
Personal care	Personal care supplies and services, electronic personal care appliances
Transportation	
Car purchases	Net outlay for cars, trucks, and other vehicles; rental; leases; licenses
Gasoline/maintenance	Gasoline and motor oil, vehicle maintenance and repair, insurance
Out-of-town public transportation	Public transportation on trips
Local public transportation	Local public transportation
Recreational expenditures	
Entertainment	Fees and admissions, TVs, radios, sound equipment, pets, toys and playground equipment, other fees such as docking/landing fees for boats and planes
Food away from home	Food away from home, excluding alcoholic beverages
Vacation house/hotel	Lodging away from home, housing for school, vacation home expenses
Reading	Newspapers, magazines, books
Other expenditures	
Education	Schoolbooks, supplies and equipment, tuition (other than day care)
Alcoholic beverages	Alcoholic beverages
Tobacco	Tobacco and smoking supplies

TABLE A1 Continued

<i>Expenditure</i>	<i>Definition</i>
Other expenditures	
Miscellaneous	Credit card fees, legal fees (excluding real estate), funeral expenses, safety deposit boxes, bank account fees, accounting fees, interest on home equity loans on properties other than primary housing unit, finance and interest charges excluding mortgage, car loans, and home equity loans
Cash contributions	Cash contributions for persons not in CU, to charity, church, educational, or political organizations
Personal insurance/ Pensions	Life insurance, retirement, pensions and Social Security, personal insurance not mentioned in other categories

NOTES

1. The rate of time preference is the marginal rate of substitution between consumption in current period versus consumption in the next period (Bryant, 1990).

2. The Hausman full information specification test, which uses 2SLS and 3SLS estimates of the entire system, requires that some equation in the system does not contain the variable(s) whose exogeneity is being tested. In this specific application, the variables being tested are total expenditure and borrowing. Because both of these variables are included in all demand equations and the borrowing equation, any misspecification regarding the exogeneity of these two variables is in the whole system even when the 2SLS method is used for estimation. For a brief discussion of this shortcoming of the Hausman test, see Greene (1997, p. 763). On the other hand, to perform the Spencer-Berk limited information specification test requires the existence of another endogenous variable (other than the ones being tested) in each equation. That requirement is not satisfied in the current situation.

3. For the system of equations to have internal consistency, so borrowing and income can be added up to equal to total expenditure, borrowing should be measured as a continuous variable. The only way to get a continuous measurement for the borrowing variable in the CE data set is to use the difference between total after-tax income and total expenditure. This method will introduce several measurement complications. First, the CE income data are known to be of less quality than the total expenditure data due to the incomplete income reporter issue (Paulin & Ferraro, 1994). Second, even if the income data were of good quality, total expenditure exceeding income for a particular year can be a result of the use of past saving instead of new borrowing. The seriousness of this measurement problem seems to be too great of a trade-off for a gain that may or may not be there.

4. The sample descriptive statistics, reported later in this article, show that nonborrowers are much older than borrowers, on average. A second set of models was estimated with a sample of consumers younger than or equal to 60, with a sample size of 3,750. The parameter estimates are very similar using this sample compared with the estimates using the whole sample. Apparently, the use of age and age-squared as independent variables is able to capture most of this age effect. Therefore, the whole sample was retained for this study for the sake of obtaining more degrees of freedom.

5. With the Consumer Expenditure Survey (CE) data set, it is possible to define borrowing as a continuous variable by subtracting total income from total expenditure. However, an examination of this continuous borrowing variable shows that more than half of the households with no form of debt other than mortgage have a higher total expenditure than their total after-tax income, and many households with some form of debt other than mortgage have a lower total expenditure than their total after-tax income. For consumers with higher-than-income total expenditure, it is possible that they are "borrowing" from their own savings, whereas for consumers with lower-than-income total expenditure, it is possible that they have simultaneous borrowing and saving. Thus, using this continuous borrowing variable may muddy the water. Furthermore, consumers who ever borrow money other than mortgage are likely to be different from consumers who never borrow any debt other than mortgage in their time preference and debt attitude, thus supporting the use of a dichotomous borrowing variable. However, it needs to be noted that given the cross-sectional nature of the data set, even this dichotomous borrowing variable has problems in capturing the borrowing status of consumers who borrowed in the past or will borrow in the future.

6. For a rough comparison, the Board of Governors of the Federal Reserve System reported that about 66.4% of U.S. households carried at least one general-purpose credit card in 1995 (U.S. Bureau of the Census, 1997, Table 800). Among credit card holders, about 48.1% only paid their balance some times or hardly ever. That is equivalent to 31.9% of all households in the United States. The estimated incidence of borrowing from credit cards is somewhat higher for this sample than that published by the Federal Reserve Board. One possible explanation for this discrepancy is that the sample of borrowers in this study may have included some consumers who only paid late fees but not interest charges. However, the data do not have enough information to allow identification of that group.

7. A model using household after-tax income as a measure for income was also estimated for complete income reporters in the CE data. The parameter estimates of this model almost all have the same direction and statistical significance as the model using total expenditure as a measure for permanent income, although the size of the effects differs somewhat.

8. A criterion of 10% was used because a smaller proportion of zero observations caused a floating point problem in the estimation process, thus the probit equation could not be estimated.

9. From Maddala (1983, p. 222), we have

$$\begin{aligned} E(y_i) &= \text{Prob}(y_i > 0) * E(y_i | y_i > 0) + \text{Prob}(y_i \leq 0) * E(y_i | y_i \leq 0) \\ &= \Phi_i \Sigma \beta_{ih} X_h + \sigma_i \Phi_i = \Sigma \beta_{ih} X_h [1 - (1 - \Phi_i)] + \sigma_i \Phi_i \\ &= \Sigma \beta_{ih} X_h - \sigma_i (1 - \Phi_i) (\Sigma \beta_{ih} X_h / \sigma) + \sigma_i \Phi_i = \Sigma \beta_{ih} X_h + \sigma_i [\Phi_i - (1 - \Phi_i) \sum_{h=1}^n \tau_{ih} X_h], \end{aligned}$$

where

$$\sum \beta_{ih} X_{ih} / \sigma_i = \sum_i \tau_{ih} C_h$$

This approach is similar to Greene's (1990, pp. 29, 732). However, Greene's formula appears to contain a mistake.

10. Each consumer unit (CU) in the CE sample represents a given number of CUs in the U.S. population. A CU's basic weight reflects its probability of selection among a group of primary sampling units of similar characteristics. By applying weights in statistical analyses, one transforms the results from sample estimates to population estimates.

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