Patterns of Overspending in U.S. Households

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An original analysis of the BLS Consumer Expenditure Survey shows that almost 40% of U.S. households spent more than their income in 1990. Multivariate logistic regression indicates that income level is the most important factor related to whether a household overspends. More educated consumers are more likely to overspend than are less educated consumers, when income and other factors are controlled.
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Overspending is generally viewed as a problem. Although under some circumstances and at some times in the family life cycle, overspending may be a rational means for consumers to maximize utility from consumption (Fan, Chang & Hanna, 1992), most consumers are unable to meet savings and other financial goals with continued overspending. Bankruptcy is an even more serious consequence of overspending. The number of non-business bankruptcies in the United States increased from 312,914 in 1981 to 811,206 in 1991 (U.S. Bureau of the Census, 1992, p. 532). The 1991 number of non-business bankruptcy applications amounted to 0.9% of the 94 million households in the U.S. (U.S. Bureau of the Census, 1992, p. 46). While a variety of factors may have contributed to this rapid increase (Fan & Hanna, 1992), overspending was probably important.

This article applies financial ratio analysis to study overspending of households participating in the 1990 Bureau of Labor Statistics (BLS) Consumer Expenditure Survey, using the ratio of annual spending to annual income as a measure of overspending. The patterns of overspending among households is studied using multivariate analysis

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(logistic regression) to determine independent effects of demographic characteristics.

Ratio Analysis and Family Spending

A financial ratio is the comparison of two pieces of financial information. Ratios are useful for evaluating the status of a particular household for counseling purposes and for analyzing financial patterns of households for research (e.g., DeVaney, 1993). Ratios can serve as a starting point for discussion and analysis of financial well being, and can also be used to help families develop appropriate saving and investment patterns to reach financial goals.

Lytton, Garman and Porter (1991) point out that ratios can provide insights not attainable through traditional financial statements, and offer "... the simplicity of a greatly reduced number of factors for consideration." (p. 7). A change in the ratio of spending to income, for example, gives more information than a change in the number of dollars spent.

Ratios can either be prescriptive -- based on what experts have calculated a family should do to reach goals, or they can be empirically based -- considering how families actually behave. Empirical analysis may be useful for prescriptions if most people are behaving "correctly", that is, in a manner which enables them to achieve their goals.

Two major problems surface for both the researcher and the practitioner in using ratio analysis. The first is determining which ratios are meaningful, with the goal of avoiding information overload and allowing for efficient predictions. The second problem is determining the best way to measure the items that constitute the ratios. Uniform, accurate and consistent measures are necessary for meaningful application of ratios.

Review of Literature

Consumption to Income Ratio

Lytton, et al. (1991) suggest that financial counselors use the Consumption to Income Ratio as one of the key ratios to consider in analyzing the financial status of a family. They suggest computing this ratio as the total of all expenditures (except savings and investments) divided by take-home income. They note that this ratio might exceed 1.0 if households withdraw from savings or take on additional credit. If the ratio is less than 1.0, the household can increase net worth, and perhaps

increase its emergency savings or make progress toward financial goals. However, Lytton, et al. (1991) did not cite any empirical studies of this ratio, so there is no information about the proportion of households meeting the suggested level of the ratio (cf Prather, 1990).

There has been a limited amount of research directly related to the empirical assessment of overspending. Danziger, Van Der Gaag, Smolensky and Taussig (1982-83) used the 1972-73 Consumer Expenditure Survey to analyze the consumption to income ratio. The consumption to income ratio did not show a strong trend by age, although households under 35 had higher values of the ratio than did middle age households, indicating a higher portion of income going for spending rather than saving, and those over 71 had slightly higher values of the ratio than did middle age households (Danziger, et al., 1982-83).

Savings as Net Worth Increase

Saving is sometimes defined as the increase in net worth during a particular period. An analysis of the Survey of Consumer Finance showed that 38% of households headed by someone age 25 or over had a decrease in real net worth between 1983 and 1986 (DeVaney, 1993). It is possible that overspending was a contributory factor in the decrease in net worth for some of those households experiencing a decrease in net worth.

The Life Cycle Model

The life cycle model provides a basis for explaining rational overspending. The model contains the assumption that consumers maximize utility from consumption over a lifetime (Ando & Modligliani, 1963). If a consumer knew when he or she would die, valued future consumption exactly the same as present consumption, and faced a real interest rate of zero, then optimal consumption per year will equal average lifetime income. The average lifetime income is similar to Friedman's concept of permanent income (Magrabi, Chung, Cha, & Yang, 1991, p. 31). If income this year is below average lifetime income, the consumer should overspend this year. If income is above average lifetime income, the consumer should underspend this year in order to repay debts from times of overspending or to provide for future years of low incomes. Given the fact that many households experience substantial increases or decreases in income from one year to the next (Chang, 1993), a considerable amount of overspending would be consistent with the simple life cycle model.

The life cycle model can be expanded to include non-zero real interest rates and impatience, which tend to have opposite effects on spending. The higher the real interest rate, the more a consumer will favor future consumption over present consumption. The more impatient a consumer is, the more he or she will favor present consumption over future consumption. Even though saving earlier in one's life has the benefit of taking greater advantage of compound interest, it may be rational for many consumers not to save at all in some years of their lives (Hanna, 1989).

The original life cycle model was based on the assumption that a consumer knew future income patterns with certainty. Extensions of the model to incorporate uncertainty show that a possibility of a moderate income increase does not necessarily justify borrowing (Fan, Chang & Hanna, 1992).

The Need for Overspending in Emergencies

The common advice to maintain an emergency fund implies a possible need for overspending. Consumers are often advised to build up a fund of emergency savings to prepare for unemployment and other emergencies, but only about 20% of U.S. households have liquid assets sufficient to cover six months of spending (Hanna, Chang, Fan, & Bae, 1993). If a household draws upon financial assets to cover current expenses, it is overspending. If a household does not have financial assets and an emergency arises, it may have to borrow, also overspending.

Financial Management Practices

It can be calculated from Davis and Weber's (1990, p.47) results that only 57% of households said they planned a budget, kept records of spending *and* compared actual to planned spending. It may be difficult for some households to avoid overspending without engaging in all three of these financial management practices. Davis and Carr (1992) reported that only about 7% of households had budgets that were mainly or completely written, and only 13% of households had budgets that were for a period as long as a year. In the absence of written, long term budgets, some households might mistakenly overspend, especially if infrequent expenses such as insurance or repairs are not anticipated.

Methods

Establishing Appropriate Ratio Components

The first step in this research was to determine which pieces of financial data to include in a ratio to study overspending. Lytton, et al. (1991) suggested the use of the Consumption to Income Ratio as a key indicator in analyzing the financial status of families. They suggested that the ratio be computed as the total of all spending during a period (month or year) divided by disposable income during that period. Their use of the term "consumption" is not consistent with economists' use of the term, as consumption is usually defined to include the use value of durable goods previously purchased (Magrabi, et al., 1991, p. 9). A family living in its own home with no mortgage, for example, has housing consumption with a value equal to the cost of renting a similar home. Spending is more appropriate than consumption to analyze family's ability to increase net worth. Spending can be financed from current income, by credit or by withdrawal of savings. If spending exceeds current income, net worth must decrease, as liabilities will increase or assets will decrease.

The Spending to Income Ratio is defined as:

$$Ratio' \frac{Total of Expenditures}{Takehome Income}$$

Establishing a Ratio Threshold for Overspending

The obvious threshold for overspending is 100%, in that normally families should spend less than 100% of their take-home income if they are to make progress towards savings goals. For the present research, a ratio value of greater than 1.0 is defined as overspending, and a ratio value of 1.0 or less is defined as not overspending.

Limitations of the Ratio Threshold. Any ratio which uses income must be interpreted with care, as a particular level of income may reflect different levels of actual well being for different circumstances. The Spending to Income Ratio for a household might slightly exceed 100%, yet if the household has a secure source of income and a generous pension plan, it might be making adequate progress toward its financial goals. A person who worked for the federal government for over 30 years might never have "saved" money, yet he or she could achieve an important financial goal by having an adequate pension. Conversely some people who spend less than 100% of income might not be making adequate financial progress. A family with a substantial amount of credit card debt should probably be spending considerably less than 100% of its income in order to quickly reduce its debt levels.

Despite the potential limitations, the Spending to Income Ratio threshold of 100% is used for the analysis in this paper in order to simplify evaluation of the actual patterns in the population and factors related to overspending. A dichotomous variable for overspending was created, defined as equal to 1.0 if the household had annual spending greater than annual income, and equal to 0.0 if the household's annual income is not greater than annual spending.

Multivariate Analysis

Regression can be used for prediction, or to analyze the effects of independent variables on a dependent variable. Multiple regression can be used to analyze the effects of a number of variables, while controlling for the effects of the other independent variables in the regression. For instance, a regression of total spending on income and household size would provide results that could be interpreted as the effect of income on spending, controlling for household size. A separate regression could be run for each household size, or, if it could be assumed that the effect of income on spending was the same for all household sizes, one regression could be run for all household sizes. An interaction term between income and household size could be added if the relationship between income and spending might be different for each household size. The most common regression procedure is Ordinary Least Squares (OLS), but if the dependent variable is dichotomous (has only two values), OLS is not appropriate (Aldrich & Nelson, 1984). Logistic regression (logit) can be used with dichotomous dependent variables.

A stepwise multivariate logistic regression[1] was used to test for the effects of a large number of independent variables. Interaction effects were also tested, as it seemed possible that the effect of one variable, such as income, might depend on the level of another variable, such as household size. A list of variables that could have entered the logistic regression is presented in Appendix A.

Data

The dataset is the 1990 EXPN tape of the U.S. Bureau of Labor Statistics Consumer Expenditure Survey. (For more information on the dataset and variables, see Bae (1992)). The 865 households participating in the survey during all four quarters of 1990 who also had complete reporting of income were selected for the analysis reported in this article. The survey year represented the first year of the 1990-91 recession (**Economic Report of the President**, 1993, p. 59) after a long period of increasing prosperity.

Measurement of Variables

Spending variable. The BLS total expenditure variable includes FICA contributions (Social Security tax) and other involuntary pension contributions. These FICA and pension contributions were subtracted to obtain a new total expenditure variable for use in this research. The BLS transportation expenditure variable was revised by subtracting vehicle purchase amounts and adding vehicle loan payments.

Income variable. The BLS after-tax income variable was also adjusted by subtracting FICA and other pension contributions. Thus, the income figure used in this research represents the amount a household can spend on current consumption, repayment of loans, and other forms of savings. There were some households with annual incomes of zero. Households with zero income were counted as overspenders.

Table 1.
Distribution of Income, Spending, and Spending to Income Ratio.

	Percentile Values for Each Variable		
	25th Percentile	Median	75th Percentile
Income after taxes	$13,544	$23,871	$40,254
Spending	$13,889	$21,298	$32,427
Spending to Income Ratio	66%	90%	121%

Note: The percentile rankings are calculated independently for each variable and do not necessarily include the same households within each grouping. A household at the median income, for example, would not necessarily be at the median level of spending, nor at the median spending to income ratio. Households with Complete Income Reporting, 1990 Interview Survey of Consumer Expenditures, Households with 4 Quarters of Interviews in 1990. (n=865)

Findings

Distribution of Income and Spending

The distributions of annual income and spending are shown in Table 1. The median level of income was $23,871, with 25% of the sample having $13,544 or less, and 25% having $40,254 or more. The median level of spending was
$21,298, with 25% of the sample spending $13,889 or less, and 25% spending $32,427 or more.

The median level of the Spending to Income Ratio was 90%, with 39.5% of the households spending more than 100% of their take-home incomes. One fourth of the sample spent at least 121% of their take-home incomes, and 25% of the sample spent 66% or less of their take-home incomes (Table 1).

Factors Related to Overspending

A comparison of overspenders to those who did not overspend (Table 2) shows:

- Overspenders had about half the mean income level of non-overspenders ($16,946 versus $37,357).
- Overspenders had lower level of financial assets ($5,510 compared to $15,640).
- Overspenders were similar to non-overspenders in total amount spent ($25,021 versus $24,370).
- The two groups did not differ significantly in "other money receipts", which is not included by BLS in money income.
- The two groups did not differ significantly in amount spent for shelter or for most other expenditure categories.
- The only categories for which overspenders spent significantly more than non-overspenders were medical ($1,939 versus $1,460) and miscellaneous ($473 versus $304).

Table 2.
Comparison of Mean Levels of Income, Selected Expenditures and Assets of Overspending and non-Overspending Households (t-tests).

	Spending/Income Ratio		
Variable	Over 1.0	1.0 or Less	Significance
Income	$16,946	$37,357	0.00
Spending	$25,021	$24,370	0.53
Net Financial Assets	$5,510	$15,640	0.00
Net Home Equity	$76,483	$87,310	0.18
Shelter Spending	$5,116	$5,062	0.87
Equipment & Furnishings	$951	$1,021	0.48
Miscellaneous Spending	$473	$304	0.02
Medical Spending	$1,939	$1,460	0.03
Non-income Receipts	$318	$469	0.57

Households with Complete Income Reporting, 1990 Interview Survey of Consumer Expenditures, Households with 4 Quarters of Interviews in 1990.(n=865)

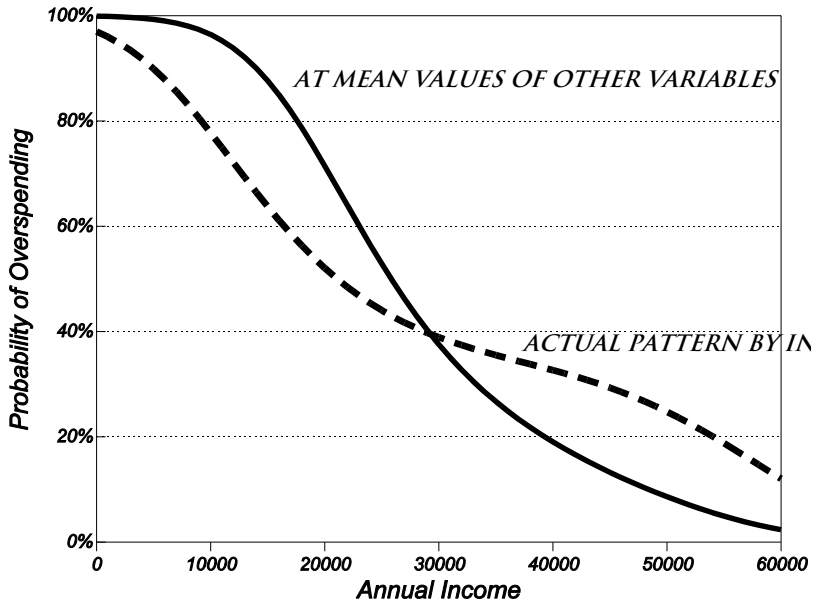
Multivariate Analysis

Multivariate logistic regression was the primary method used in this article to investigate factors related to overspending. A large number of demographic variables were used, including interaction terms between age, income and household size (Appendix A). In order to reduce the effects of multicollinearity (inefficient estimation due to linear relationships among independent variables), a stepwise procedure was used. The results are shown in Table 3 in Appendix A. For comparison, separate logistic regressions were run for each set of independent variables that was significant in the complete stepwise regression, so that the effect of age variables only, income variables only, etc. could be found[2].

Effects of Income. Figure 1 shows the effect of income on the probability of overspending, assuming mean values of the other independent variables[3]. Up to an annual income level of $9000 per year, the predicted probability of overspending is 97% or higher. The likelihood of overspending decreases rapidly as income increases from $15,000 per year to $40,000 per year. The predicted probability of overspending drops below 50% at incomes of $26,000 and above. The predicted probability of overspending drops to 25% at an income of $36,000, and 9.5% at an income of $49,000. At incomes of $65,000 and over, the predicted probability of overspending drops below one percent.

For comparison, a logistic regression of overspending[4] as a function only of income, income squared and income cubed was run. Figure 1 shows the predicted probability of overspending by income, *not* controlling for other variables. The predicted probability of overspending decreases as income increases, but more slowly than the relationship when other variables are held at mean values. At an annual income of $9,000 per year, the predicted probability of overspending is 80.5%. The predicted probability of overspending drops to 50% at an income of $21,000, to 25% at an income of $50,000, and to 9.5% at an income of $62,000.

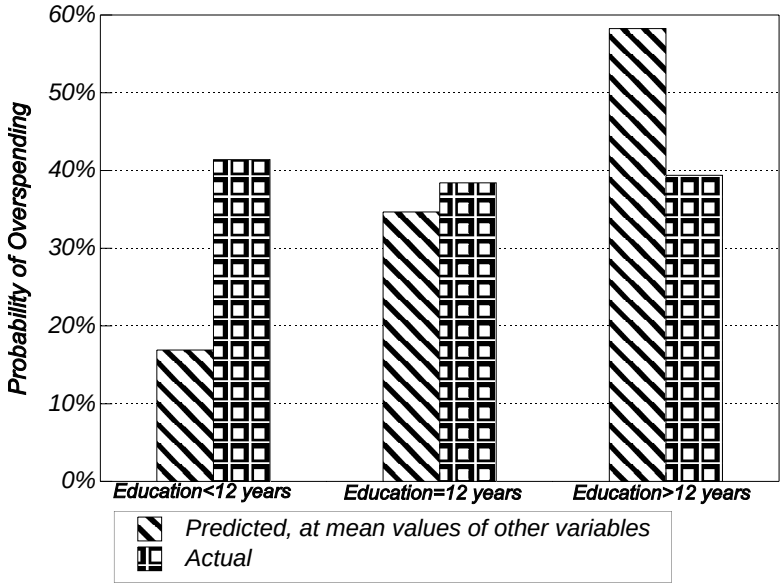
Figure 1.
Effect of Income On Overspending, at Mean Values of Other Variables (Based on Table 3) and as Function of Income Variables Only.



Effects of Education Figure 2 shows the effect of education on the probability of overspending, at mean values of other variables, and also based on education only. The probability of overspending increases with education, if other variables are held constant. At the mean values of other variables, households headed by someone with less than 12 years of education had a 17% probability of overspending, households headed by someone with exactly 12 years of education had a 35% probability of overspending, and those with more education had a 58% probability of overspending. For comparison, Figure 2 also shows the results *without* controlling for the effects of the other variables. Those with less than 12 years of education are slightly more likely to overspend than those with

more education, but there was no significant difference between the groups.

Figure 2.
Effect of Education On Overspending at Mean Values of Other Variables (Table 3), and as Function of Education Variables Only.

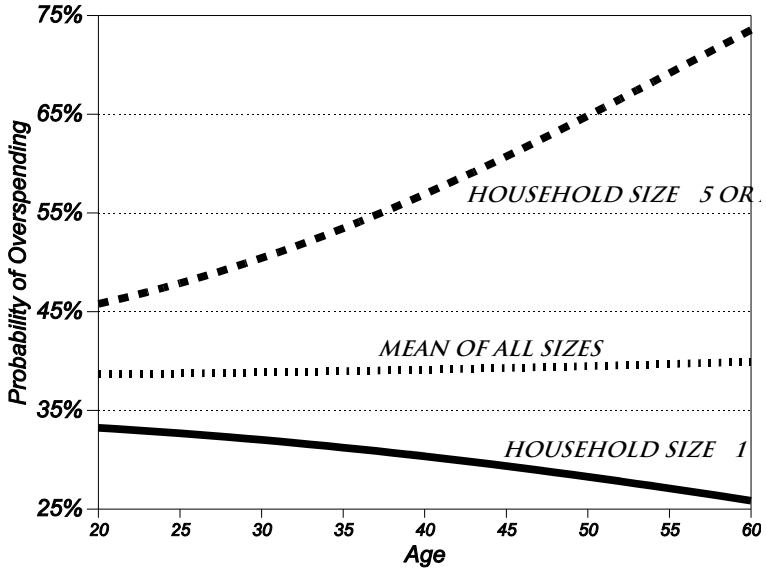


Effects of Age. Figure 3 shows the effect of age on the probability of overspending. At mean values of other variables, the probability of overspending *decreases* with age for one person households, *increases* with age for households with five or more people, and has no relationship to age for households with two to four people. There was no significant bivariate relationship between overspending and age variables.

Effects of Household Size. Figure 4 shows the effect of household size on the probability of overspending. At mean values of other variables, one person households had a probability of overspending of 11%, compared to 42% for households with two or three persons, 56% for households with four persons, and 42% for households with five or more

persons. There was not a significant bivariate relationship between household size and overspending.

Figure 3.
Effect of Age On Overspending at Mean Values of Other Variables (Table 3).

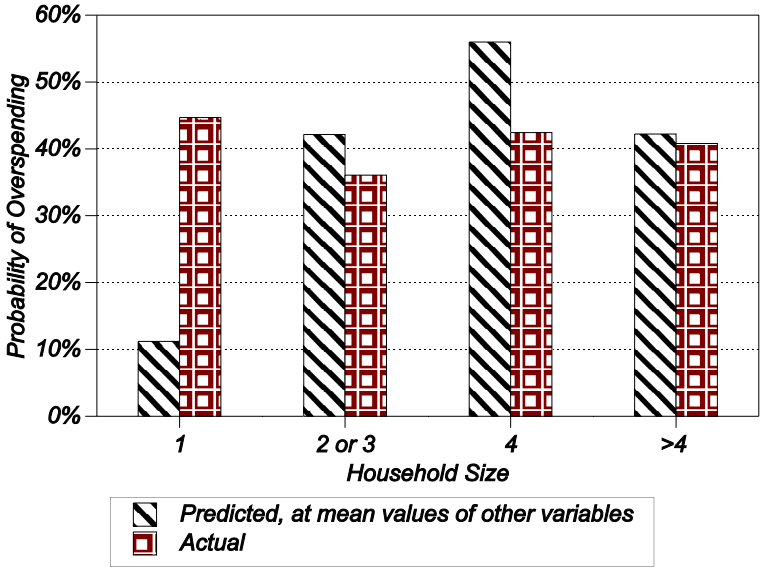


Effects of Other Variables. Controlling for income and other factors, factory workers were *less* likely to overspend than those with other occupations, while those who lived in the West or in metropolitan areas with three million population or more and homeowners with mortgages, and married couples with a child over 17 were *more* likely to overspend than those in other categories. Controlling for income and other factors, the probability of overspending *increased* with the number of earners in the household.

Variables That Did Not Enter Logistic Regression. Variables related to race (Black versus non-Black) and ethnic status (Hispanic versus non-Hispanic) did not enter the logistic regression. The lack of significance of these variables can be interpreted as meaning that at the same level of

income, there is no difference in overspending between racial and ethnic groups. Only one dummy variable entered from each of four sets of dummy variables: housing tenure, occupation, city size and region. In each case, the results can be interpreted as meaning that the group represented by the variable that did enter is not significantly different from all other groups in overspending. For instance, homeowners with mortgages are significantly more likely to overspend than were the combined group of renters and homeowners without mortgages, if all other variables are at mean levels.

Figure 4.
Effect of Household Size On Overspending at Mean Values of Other Variables (Table 3) and as Function of Household Size Only.



Discussion of Results

Overspenders Versus Non-Overspenders

Overspending is common among U.S. households. The results do not indicate whether particular households have continued overspending, or whether overspending was rational according to life cycle needs. The lack of a uniform relationship of overspending to age suggests that overspending is not closely tied to life cycle stages.

The most important factor related to overspending is low income. Overspenders had lower levels of net financial assets than those who did not overspend, so that some of those overspending may have built up debt levels in order to maintain spending when income dropped, while other overspenders may have already depleted financial assets. Medical costs might have contributed to part of the overspending problem, but the difference in mean medical spending between the two groups was less than $500, which was much less than the average gap between income and spending for overspenders.

Multivariate Results

Income. A majority of households with takehome incomes below $21,000 per year overspent. At the mean values of age, household size and other demographic variables, the predicted amount of overspending was over 50% for income levels below $26,000 per year. Almost 10% of households with incomes of $62,000 per year overspent, but at the mean values of other demographic variables, predicted overspending would be less than 2%. A simple explanation of these patterns is that households have needs and wants that tend to be covered even if a household does not have a sufficient income level. However, it is not feasible to continue to overspend without depleting assets, running out of credit, and/or facing default. A substantial number of overspending households might be in a cycle of repeated bankruptcies, wiping out their debts and building them up again. Given that the number of nonbusiness bankruptcies filings in 1991 represented less than 1% of U.S. households (U.S. Bureau of the Census, 1992, p. 46, p. 532), it seems unlikely that anticipation of bankruptcy could represent a major cause of overspending for the 39.5% of households who overspent in 1990.

Education. Controlling for income and other variables, college educated consumers were more likely to overspend than those with a high school education or less. This result suggests that ignorance is unlikely to be a major cause of overspending. The strong inverse effect of education on the probability of overspending suggests that households who are above

their average lifetime income level are unlikely to overspend, and those that are below their average lifetime income level are likely to overspend. For instance, for a household headed by someone with less than a 12th grade education, an annual takehome income equal to the overall sample mean of $29,287 would likely be above its past and/or future expected income, so it would be unlikely to overspend. The results of the logistic regression imply that the predicted probability of overspending in such a case would be only 17%. Conversely, for a household headed by someone with a college education, the mean takehome income of $29,287 would likely be below its past income and/or its future expected income, so it would be likely to overspend. The results of the logistic regression imply that such a household would have a 58% probability of overspending.

Age. The effects of age in the multivariate logistic regression are not clear cut. Predicted overspending increases with age for one person households and decreases with age for households with five or more people. Contrary to the predictions of the simple life cycle model, there is no bivariate relationship between age and overspending. The lack of a pattern of overspending among the elderly may be due to a combination of precautionary savings to prepare for possible medical problems and nursing home expense, bequest motives, and the fact that a portion of some pension income is inappropriately measured as income rather than dissavings.

Household Size. At the mean level of income and other variables, the probability of overspending increases with household size up to a size of four persons, then decreases somewhat for sizes of four or more. A possible explanation for part of this pattern is similar to the explanation offered above for the effect of education on overspending -- the mean income level is above the average income of one person households but below the average income of four person households. Elderly one person households are very unlikely to overspend.

Implications

Implications for Consumer Education

The result that only 60% of households did not overspend could be compared to Davis and Weber's (1990, p.47) results that only 57% of households said they planned a budget, kept records of spending *and* compared actual to planned spending. It is possible that some households would avoid overspending if they followed recommended

financial practices. However, the fact that more educated consumers were more likely to overspend than similar less educated consumers makes it unlikely that simple ignorance is a major cause of overspending.

Implications for Financial Counseling

There is no "typical" household to which a counselor can refer to when analyzing the Spending to Income Ratio of a particular household. The median level of this ratio, 90%, happens to correspond to the common prescription of saving 10% of income. However, there is little theoretical or empirical basis for using 90% as a universal prescription. At a minimum, a counselor should consider the income level, age, and likely income trends for a household before reaching conclusions about the implications of a particular level of the Spending to Income Ratio. Overspending should be placed in the overall context of its role in achieving or not achieving goals, rather than as a negative situation by itself.

In order to help a household reach its financial goals rather than a particular ratio, a counselor should consider time periods longer than one year, and analyze past and future changes. Factors such as labor force chances, unusual expenses, divorce and substantial chances in pay should be considered when analyzing spending. To properly take these factors into account, one year is too arbitrary and short a time period. Past and expected changes in a household's net worth over a period of two to five years would give a more useful picture of the household's financial progress, and would be more useful in determining whether financial goals are realistic.

Analyzing financial well being over a longer time period would enable the counselor to help determine whether overspending is part of a rational plan to meet goals or deal with emergencies that have occurred, or whether it is a part of a behavior pattern that is a problem and will interfere with achievement of goals. The counselor could help develop a plan for future values of the Spending to Income Ratio, consistent with goals and expected changes in the household's situation.

Limitations

There are many possible sources of bias in the analysis presented in this article. It is not clear, however, that the biases mean that the 40% level of overspending found in this analysis is an underestimate or an overestimate. Not all spending is accurately reported in the BLS Consumer Expenditure Survey, but it is also possible that some income

is not reported. Some of the expenditures counted in this article's measure of current spending were for durable goods, especially in the equipment and furnishings category. The households who had four quarters of interviews may be different from all households, but it seems plausible that they would be less likely to overspend than households who did not have four quarters of interviews. DeVaney's (1993) finding that 38% of households headed by someone age 25 or over had a decrease in real net worth between 1983 and 1986 suggests that the estimate presented in this article is plausible.

Implications for Future Research

Repeating this analysis for different years would be useful. There may be some special characteristics of the survey year, 1990, as it was the first year of a recession after one of the longest periods of prosperity in the history of the U.S. (Economic Report of the President, 1993, p. 59). It might also be useful to analyze different family types separately. For instance, if married couples were analyzed separately, it might be possible to obtain more insight into the effect of the wife's employment on overspending.

One of the limitations of this study is the analysis of overspending as an "either/or" variable. The use of other multivariate techniques to analyze the Spending to Income Ratio, such as multinominal logistic regression, might provide additional insights.

Endnotes

1. It was not appropriate to use the Spending to Income Ratio as a dependent variable in an Ordinary Least Squares Regression. Some households had zero income, and others had very low incomes, resulting in extremely high levels of the Spending to Income Ratio. The extreme values of the actual ratio made multivariate analysis with the ratio as the dependent variable problematic. In order to have a straightforward multivariate analysis, a dichotomous variable was created for overspending, with the two values being overspending (Spending to Income Ratio greater than 100%) and not overspending (ratio equal to 100% or less.) In the stepwise logistic regression, independent variables were allowed to enter if the effect of the variable was significantly different from zero at the 0.15 level.

2. Only the logistic regression of overspending on income, income squared and income cubed had a high McFadden R squared level. The R squared values for the complete stepwise logistic regression and the logistic regressions for each set of independent variables are shown below:

Logistic Regression	McFadden R squared		McFadden R squared
Complete logit	0.3529	Education dummy variables	0.0004
Income terms only	0.2161	Occupation service, laboror	0.0005
Family size terms only	0.0042	Number of earners	0.0118
Age terms only	0.0001	Married couple,child>17	0.0000
Homeowner with mortgage	0.0061		

3. The calculations for predicted probabilities were adjusted so that at the mean values of the independent variables, the predicted probability was equal to the mean for the sample.

4. Results of separate logistic regressions available from second author.

Appendix A: Logistic Regression Results and Definitions of Selected Variables

Table 3.
Final Step of Logistic Regression of Overspending on Demographic Variables.

	Coefficient	Sig.
Income	-4.5520E-04	0.0001
Income squared	9.4232E-09	0.0001
Income cubed	-7.7518E-14	0.0018
Number of earners	0.3059	0.0238
Income*(Household size=1)	-5.0375E-05	0.0083
Household size=4	0.5591	0.0329
Age^2*(Household size=1)	-1.1100E-04	0.1223
Age^2*(Household size>4)	3.7200E-04	0.0141
Married couple with child>17	0.6756	0.0214
Education < 12 years	-1.9253	0.0001
Education = 12 years	-0.9665	0.0001
Region West	0.5449	0.0192
City of 3 million or more	1.2583	0.0001
Homeowner with mortgage	0.7913	0.0002
Laborer,service,operator,fabricator occupation	-0.5007	0.0406
Intercept	5.5266	0.0001
McFadden R squared = 0.3477		

Households with Complete Income Reporting, 1990 Interview Survey of Consumer Expenditures, Households with 4 Quarters of Interviews in 1990.(n=865) The SAS Logistic Regression prcedure was used. The complete list of independent variables which could have entered the logistic regression is given below.

Dependent variable (Table 3) **Expense** = total expenditure (as counted by BLS) - total amount of pension contributions (see below) - net vehicle purchases + vehicle installment payments.

The variables that could have entered the stepwise logistic regression (Table 3):

1) **Income** = aftertax income - pension contributions. Before Tax Income=
   a) Total amount of wage and salary income before deductions by all CU members in past 12 months added to the total amount of income or loss received from a non-farm business, partnership or professional practice by family in past 12 months.
   b) Total amount of income or loss received from one's own farm by family in the past 12 months.
   c) Total amount of money received from Social Security and Railroad Retirement benefit checks by all CU members prior to deductions for medical insurance and medicare in past 12 months.

d) Total amount received in Supplemental Security Income checks from all sources for all CU members in past 12 months.
e) Total amount received from unemployment compensation.
f) Amount received from workers' compensation and veterans' payments, including education.
g) Amount of public assistance or welfare received, including job training grants such as job corps.
h) Amount received as interest on savings accounts of bonds. Amount of regular income received from dividends, royalties, estates, or trusts.
i) Amount received from pensions or annuities.
j) Amount of net income or loss received from roomers or boarders.
k) Amount of net income or loss received from other rental units.
l) Amount of regular contributions received from alimony,child support, and other sources combined.
m) Amount received in other money income including money received from care of foster children, cash scholarships and fellowships, or stipends not based on working.
n) Annual value of food stamp received.

After Tax Income = Before Tax income - Total amount of personal taxes
Income ("Takehome" Income) = Aftertax Income - Pension Contributions
Pension Contributions
a) Total amount of railroad retirement deducted from last pay annualized for all consumer unit.
b) Employee contributions to Social Security during the past 12 months.
c) Total amount of private pensions deducted from pay (annualized).
d) Total amount of government retirement deducted from last pay annualized.
e) Amount of money placed in a self-employed retirement plan in past year.

2) **Other receipts** (Total amount of other money receipts not included in family income)
a) Amount of lump sum receipts from estates, trusts, royalties, alimony, child support, prizes, games of chance, or persons outside the Consumer unit.
b) Amount received from sale of household furnishings, equipment, clothing, jewelry, pets or other belongings, excluding the sale of vehicles or property.
c) Amount of refund for overpayment of Social Security.
d) Amount received in refund from insurance policies.
e) Amount received in refund from property tax

3) **Net financial assets** = Total financial assets - Non-mortgage debt

Total financial assets included the following: investment in own farm or business, amount of money in checking, brokerage & other similar accounts, money owed to Consumer Unit, amount in savings accounts, market value of all stocks and bonds, and amount in U.S. Saving Bonds.

Non-mortgage debt is defined as the total amount owed as of one year ago subtracted from the total amount owed as of last bill.

4) **Age of reference person**; **Age squared**

5) Household size dummy variables: **Household size = 1**; **Household size = 2** (omitted category) **Household size = 3**; **Household size = 4**; **Household size > 4**

6) **Black** (1=Black, 0=other)

7) **Hispanic** (1=Hispanic origin, 0=other)

8) Housing tenure: **Homeowner with mortgage**, **Homeowner without mortgage**, **Renter** (omitted category)

9) Education: **Less than 12 years of education, 12 years of education, College or more than 12 years** (omitted category)

10) Family Type: **Husband and wife only**; **Husband and wife with at least one child, all under 18 Husband and wife with oldest > 17 & all other married**
Single parents with children at least one age < 18; **Single persons** (omitted category)

11) Occupation of reference person: **Precision production, operators, fabricators, laborers, services, armed forces**; **Self employed; Farming; Retired**; **Not working**; **Managerial, professional, technical, sales, administrative** (omitted category);

12) Size of city: **More than 4 million, 1.20 - 3.99 million, 0.33 - 1.29 million, 75 - 329.9 thousand, Less than 75 thousand (omitted category), Missing value of city size category**

13) Region: **Northeast, Midwest, West, South (omitted category), Missing(rural)**

14) **Net Equity in Home** = Value of home - balances owed on mortgages

aInteraction Terms: Age x Family Type Dummy variables; Age Squared x Family Type Dummy variables
Age x Household Size Dummy variables; Age Squared x Household Size Dummy variables
Age variables with Income variables; Household Size variables with Income variables
Age variables with Income variables; Age variables with Net Financial Assets

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