

Negative Net Worth And The Life Cycle Hypothesis

Peng Chen,¹ The Ohio State University
Michael S. Finke,² The Ohio State University

Characteristics of families with a negative net worth are explored using data from the 1992 Survey of Consumer Finances. Life cycle theory is applied to predict which households choose to go into negative net worth. Logit analysis showed that well educated young households who might expect increasing incomes are more likely to have a negative net worth.

KEY WORDS: *life cycle hypothesis, net worth, Survey of Consumer Finances.*

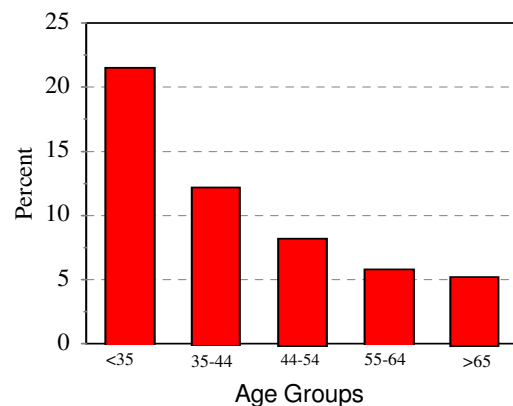
Introduction

Having a negative net worth is often associated with a low level of economic status and even stigmatized as the end result of poor financial planning. Bankruptcy is often a consequence of being deep in debt. However, there are times when a household might rationally choose to borrow heavily and incur a temporary negative net worth in early adulthood. Permanent income and life cycle theory predict that households expecting increasing incomes will borrow while young - experiencing a temporary, planned time interval where net worth will be less than zero.

The proportion of all American households with zero or negative net worth in 1993 was 11% (U.S. Census Bureau, 1995). Figure 1 shows that the proportion of households with zero or negative net worth decreases as households age (U.S. Census Bureau, 1995). The proportion is highest for householders under age 35 (22%) and declines to around 5% for householders over 65.

The purpose of this paper is to study whether the life cycle hypothesis is consistent with observed determinants of negative net worth. Results should help financial counselors and planners better understand the factors influencing a client's saving and consumption behavior. This study could also help financial educators and planners determine which households are rationally choosing to have a negative net worth, and which households have a negative net worth due to poor financial planning.

Figure 1
Proportion of Households With a Negative Net Worth among Different Age Groups, 1993



Literature Review

Life Cycle Hypothesis:

The life cycle hypothesis (Ando & Modigliani, 1963) provides a theoretical base for studying the pattern of net worth over the life cycle. The life cycle model states that the consumer maximizes utility subject to available resources, including those resources expected in the future. Operating under the assumption that one's utility function does not change over time, a relatively smooth consumption path will be consistent with optimal

¹Peng Chen, Ph.D. candidate, Consumer and Textile Sciences, The Ohio State University, 265 Campbell Hall, 1787 Neil Ave., 43210-1295. Phone: (614) 292-4590. Fax: (614) 292-7536. E-mail: chen.368@osu.edu

²Michael S. Finke, Ph.D. candidate, Consumer and Textile Sciences, The Ohio State University, 265 Campbell Hall, 1787 Neil Ave., 43210-1295. Phone: (614) 262-7493. Fax: (614) 292-7536. E-mail: finke.2@osu.edu

satisfaction.⁴ In other words, a consumer who prefers a steady path of consumption will save in those life cycle stages when her income is relatively high and dissave when her income is relatively low. Those who expect substantial real income growth in the future may rationally choose to borrow to increase current consumption at the expense of future consumption.

The life cycle hypothesis postulates a pattern of net worth through the life cycle that reflects these rational tradeoffs between current and future consumption. During early adulthood, net worth will be low due to a relatively low income and high spending needs. Tobin (1967) notes that a household might incur negative net worth in early life cycle stages to purchase housing and other durables needed to start a family. Households behaving according to the assumption of life cycle savings model may have negative net worth until middle age. As a household ages, income often increases beyond a family's immediate consumption needs which results in a rising net worth. Net worth will reach the highest level just before the consumer's retirement and then decrease as the household uses its savings to supplement other sources of retirement income.

Considering the consumer's risk averse nature and the interest rate among other factors, Hanna, Fan and Chang (1995) offer a pragmatic normative model of consumption, saving and net worth patterns over life cycle stages. The effects of risk tolerance, personal discounting of future consumption, and the influence of real interest rate on savings and borrowing upon life cycle behavior are analyzed. If real income is expected to increase substantially, households practicing optimal life cycle consumption may spend more than they earn. If initial assets are low, such households may have negative net worth well into middle age.

Empirical Research on Net Worth and the Life Cycle Hypothesis

Many researchers have tested and expanded the model's implications for household wealth accumulation using national survey data. Lydall (1955) found that mean net worth grew steadily with the age of household heads in the United Kingdom until age 64, after which mean net worth decreased slightly.

Wolff (1980) investigated the validity of the life cycle hypothesis using cross sectional data with a sample of 63,457 households in the U.S. in 1969. He categorized the sample based on educational attainment, race, and

urbanization, in order to study the relationship between household wealth and age among these groups. For non-whites, rural residents, and the less educated, the relationship was not significant. The explanatory power increased significantly when the non-cash financial assets were excluded from the household portfolio. Wolff concluded that the life cycle hypothesis was only appropriate to explain the behavior of the "primary working class" — namely white, urban and educated middle classes and their accumulation of housing, durables, and cash. The life cycle model was not able to predict the behavior of the other two groups as well — the "capital class" (the rich), and "secondary working class" (the poor). Wolff suggested that rich people may have received inter-generational transfers from family members, violating life cycle assumptions. The poor, on the other hand, often do not have enough income to accumulate any wealth over their lifetime.

Based on results from prior life cycle studies, Sinha (1988) concluded that the heterogeneity of the population contributes to the failure of life cycle models to explain wealth accumulation patterns. He stated that what appears to be myopic borrowing behavior by the bottom 30% of the population may be due to a severe constraint on available credit. The middle 40% of the population, however, do appear to borrow and save in a pattern that conforms most closely with the life cycle model. The rich appear to oversave, since wealth is often transferred from one generation to the next.

Using cross-sectional data from the 1983 Survey of Consumer Finances, Hanna and Prather (1989) found that age and income are the key variables when predicting net worth. The findings, consistent with the life cycle hypothesis, are quite similar to those derived from aggregate data. Generally, net worth increases up to age 60 and starts to decline after age 64.

Despite the frequent use of the life cycle model when studying both aggregate and household level wealth accumulation, there has been virtually no empirical research focusing on households with a negative net worth. Researchers tend to ignore those who choose to have a negative net worth, often with the assumption that people with a negative net worth are poor. For example, Diamond and Hausman (1984) found 8% of men aged 45-59 reported having a negative net worth. Diamond and Hausman chose not to include them in their study, citing insufficient resources to practice life cycle behavior.

Liquidity Constraint

The life cycle hypothesis implicitly assumes that households can borrow as much as is needed to distribute their resources evenly over the remainder of their life span (Ando & Modigliani, 1963). In reality, households face a constraint on the amount of money they are able to borrow at any point in time. Lenders are more willing to lend to those with a higher income, longer credit history, or even more assets for collateral. Although it is not difficult for households to get credit nowadays, it is not that easy to get credit with desirable low interest rates for large amounts. These liquidity constraints may influence who is able to borrow into a situation of negative net worth, and how close a household may get to its optimal level of debt. Another factor, uncertainty about future income patterns, also affects households' net worth accumulation. It is intuitive that households facing a high level of uncertainty would not borrow as much as if they were certain about future income. Fan, Chang and Hanna (1993) showed that even with a high level of uncertainty, young consumers should still borrow against their future income.

The purpose of this article is to investigate the value of using the life cycle hypothesis to explain patterns of negative net worth.

Data And Methodology*Data*

The sample used in this study was from the public use tape of the 1992 Survey of Consumer Finances (SCF) cross-section data. The survey was conducted by the National Opinion Research Center at the University of Chicago and sponsored by the Federal Reserve Board and several other federal agencies (Kennickell & Shack-Marquez, 1994). The 1992 Survey of Consumer Finances gathered detailed household-level information on the composition of assets and liabilities of 3,906 households. The survey over-sampled wealthy households. In this analysis, data were weighted to obtain more precise information about the average U.S. household. Multiple imputation was used to replace missing values with a set of values that draw from a distribution of possibilities of those missing values. There were five data sets created in the 1992 Survey of Consumer Finances by this multiple imputation method. Analysis was performed for each set. The results reported were obtained by combining results from the five analyses based on Bayesian theory (Rubin, 1987). Among the 3,906 households, 220 had a net worth less

than zero. The weighted portion of total American households with a negative net worth is about 7.5%.

Sinha (1988) argued that different results of empirical tests on the life cycle model using micro data were partially due to differences in the data sets used. Some data sets used were only collected on a subsample, therefore most results cannot be treated as representative of the whole population. Data from the 1992 Survey of Consumer Finances is collected on the assets and liabilities of a nationally representative sample of U.S. households through in-person household interviews. Therefore, the sample representative bias should not be a problem in this study.

Dependent Variable

Since the purpose of this study is to investigate whether the life cycle hypothesis is consistent with the observed determinants of negative net worth, whether a household had a negative net worth or not is chosen as the variable to be explained. Households with net worth less than zero were coded 1, otherwise 0. Net worth was calculated as the total dollar amount of assets (including dollar value of financial assets: checking accounts, savings accounts, money market accounts, IRAs, Keoghs, CDs, saving bonds, bonds, stocks, mutual funds holdings, profit sharing and thrift accounts, cash value of life insurance; and nonfinancial assets: current market value of home, other properties, businesses, vehicles, and collectibles, minus the total dollar amount of liabilities (including dollar value of total real estate debt, consumer debts, and other debts).

Independent Variables

Wolff (1980) states that there are four other groups of factors besides age that can affect household wealth holdings, including (1) differences in lifetime earnings and its distribution over time, (2) differences in saving rates over time, (3) differences in rates of return on asset holdings, and (4) differences in gifts, inheritances, and other transfers of wealth. In this study, explanatory variables were chosen as a proxy for these factors. These explanatory variables are grouped into three categories: socio-demographic and household financial status, expectations and risk tolerances, and wealth transfers. Socio-demographic and household financial status have great impact on household earnings and savings. Households' expectations and risk tolerances directly influence the rate of return on their assets.

Socio-demographic variables include age, race, marital

status of the respondent, highest educational attainment among household members, and the household size. *Age* and *age squared* were included as continuous variables. Marital status was coded as 1 if the respondent was *married*, 0 otherwise. Educational attainment between spouses was coded into three dummy variables; *less than high school* if neither spouse received a high school diploma, *high school* if either spouse received a high school diploma, and *college* if either spouse earned a college degree. Race and ethnicity are coded into four dummy variables — *white*, *Black*, *Hispanic*, and *others* (including Asian, American Indian, Eskimo, and Aleut).

Two age and educational attainment interaction variables are included in the analysis to investigate the joint effect of age and education on negative net worth. They are interactions between age and college education (*age*college*) and between age and high school education (*age*high school*).

Household Financial Status Variables *Income* is the value of total household income in 1991 before tax and other deductions. *Full-time* is coded as 1 if the respondent worked more than 35 hours a week on the main job, 0 otherwise. *Self-employed* respondents were distinguished by a dummy variable which is coded as one if the respondent is self-employed. A dummy variable is coded as 1 if the respondent is a *homeowner* (if the value attached to the primary residence is greater than zero).

Two continuous variables are used for proxies as the liquidity constraint faced by the household: the maximum *credit card limit* that the household could access and the maximum amount the household could borrow through line of credit (*credit line*).

The years that the respondent expects to continue working for the same employer is included as a proxy for *job security*.

Expectations and Risk Tolerance Expectations variables includes attitudes toward future income, the future of the economy, and future interest rates. *Expected future income* is coded as 1 if the respondent expects the total family income to increase at a greater rate than prices in the next five years. *Expected economy* was coded as 1 if the respondent expects the economy as a whole to perform better in the next five years. *Expected interest rate* is coded as 1 if the respondent expects the interest rate will be higher in the next five years.

Risk Tolerance Four dummy variables are created to measure the household's risk tolerance level. *Substantial risk* equals 1 if the household is willing to take substantial financial risk to earn substantial returns; *above average risk* is coded as 1, if the household is willing to take above average financial risk to earn above average returns; *average risk* is coded as 1, if the household is willing to take average risk to earn average returns; *no risk* is coded as 1, if the household is not willing to take any financial risk; 0 otherwise.

Wealth Transfers Two dummy variables are created to measure the wealth being transferred or expected to be transferred to the household. *Expected inheritance* is coded as 1, if the household expects a substantial inheritance or transfer of assets in the future; *inheritance* is coded as 1, if the household has received an inheritance or been given substantial assets.

Analysis

Means and frequencies were presented to show the demographic characteristics of the entire sample and the two sub-samples (separated by non-negative and negative net worth). A household balance sheet was calculated to review the detailed information on the composition of assets and liabilities for the general population and the two sub-groups.

Multivariate logistic regression was used to investigate the determinants of negative net worth. According to the life cycle hypothesis, the amount of net worth accumulated over the lifetime has a non-linear relationship with age. Many previous studies transformed data to compensate for non-linearity by employing log, square, and square root functions. In this study, logit was chosen to investigate the determinants of negative net worth.^b Results for the estimated probability of having a negative net worth were generated from the whole sample.^c The coefficients obtained through logistic analysis can be interpreted as changes in the odds ratio.^d The first logistic regression was conducted with only two age variables -- *age* and *age*². The aim was to investigate the explanatory power of age on probability of having a negative net worth, since empirically age is the dominant factor when using the life cycle hypothesis to predict a household's behavior toward net worth. The second logit adds two educational attainment dummy variables and two age and education interaction variables. Since human capital (measured by educational attainment) is most closely associated with future income patterns, it is

included to investigate how the expected income stream will impact having a negative net worth. The third logit was performed on the full model, using all of the four groups of variables defined above, to provide a broader picture of the determinants of negative net worth.

Findings

Descriptive Statistics

Table 1 presents the demographic characteristics of the entire sample, households with a negative net worth, and households with non-negative net worth. There were 220 households in the entire sample that had a negative net worth and 3,686 that had a positive net worth. The weighted proportion of households with a negative net worth was 7.5% of all American households (10.3% had a zero or negative net worth).

The mean income of households with a non-negative net worth was \$40,368, nearly double that of households with a negative net worth (\$22,196). The median income for the entire sample was \$25,000, and \$15,000 for households with a negative net worth. The mean age of those with a negative net worth (35) was less than other households (50). More than 78% of respondents from households with a negative net worth were less than 40 years old, compared to just 35% of those with a non-negative net worth. Households with a negative net worth were also more likely to be non-white (35%) than households with a non-negative net worth (24%). Households with a non-negative net worth were more likely to be married than households with a negative net worth. On average, the educational level of households with a negative net worth was similar to those with a non-negative net worth. There is a dramatic difference in the proportion of home ownership between households with negative net worth and those with non-negative net worth, 13% versus 68%.

Table 2 shows the average household balance sheet in both dollar amounts and percentages for the whole sample, the households with a negative net worth, and the households with a non-negative net worth. The mean dollar value of total assets held by households with a negative net worth was about 5% of total assets held by households with a non-negative net worth -- \$12,031 versus \$236,742. Households with a negative net worth have a very small amount of financial assets (\$1,247) and liquid assets (\$591). Households with a non-negative net worth had mean holdings of financial and liquid assets of \$72,377 and \$12,775, respectively. For some of the asset categories such as CDs, stocks, bonds and mutual funds,

households with a negative net worth had virtually no holdings. Around 90% of their total assets were in non-financial assets and mostly in vehicles, housing, and other real estate, compared to just 69% for other households.

Table 1
 Characteristics of the Sample and of Households With a Negative Net Worth and Households With a Non-negative Net Worth.

Variable	Entire Sample	Hshlds with NW<0	Hshlds with NW >=0
Age<29 (%)	16.4	43.7	14.3
Age 30-39 (%)	21.3	30.7	20.6
Age 40-49 (%)	19.8	11.3	20.4
Age 50-59 (%)	13.4	7.0	14.0
Age 60-69 (%)	13.7	5.0	14.3
70 & over (%)	15.4	2.2	16.4
Ed. < H.S. (%)	22.2	26.0	19.8
H.S. or some college (%)	40.6	38.3	40.8
4 years college or + (%)	37.2	35.7	37.3
Mean Income (1000s \$)	38.9	22.2	40.4
Median Inc (1000s \$)	25.0	15.0	26.5
Mean NW (1000s \$)	184.7	-7.8	199.6
Respondent male (%)	72.3	66.6	72.7
Married (%)	53.8	39.8	54.9
White (%)	75.1	64.9	76.0
Black (%)	12.7	17.5	12.3
Hispanic (%)	7.6	14.5	7.0
Other (%)	4.6	3.1	4.7
Mean household size	2.6	2.7	2.6
Own home (%)	63.9	12.6	67.9

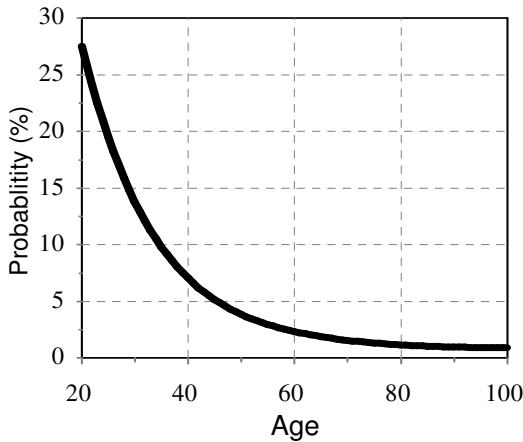
Even though households with a negative net worth had a much smaller mean dollar amount of assets compared to other households, they held 50% as much total debt. Households with a negative net worth held more consumer debt than households with a non-negative net worth. The average household with a negative net worth had \$1,875 credit card debt and \$6,149 on installment loans, compared to \$948 and \$2,697 for other households. Households with a negative net worth held much more educational debt than household with a non-negative net worth. On average, households with a negative net worth had \$5,131 in education loans, compared to only \$392 for the average household with non-negative net worth. Moreover, the debt structures were also quite different from households with a negative net worth. For households with a non-negative

net worth, mean housing debt was 66% of total debt, compared to only 26% for those with a negative net worth. On the other hand, education debt was 27% for those with a negative net worth and only 1% for those with a non-negative net worth. Installment debt was 57% of the total debt for households with a negative net worth and only 8% for those with a non-negative net worth.

Determinants of Negative Net Worth

Results of the three logistic analyses on the determinants of negative net worth are presented in Table 3. With only the two age variables included in the logistic analysis, both *age* and *age squared* have a significant effect on the probability of negative net worth. The joint effect of *age* and *age squared* on probability of negative net worth is negative, implying that young households are more likely to have a negative net worth. The predicted probability of negative net worth starts from about 28% at age 20, then decreases as the householder ages to around 1% at age 80. A clear downward sloping relationship between age and probability of negative net worth is shown in Figure 2.

Figure 2
Age Effect on Predicted Probability of Negative Net Worth.



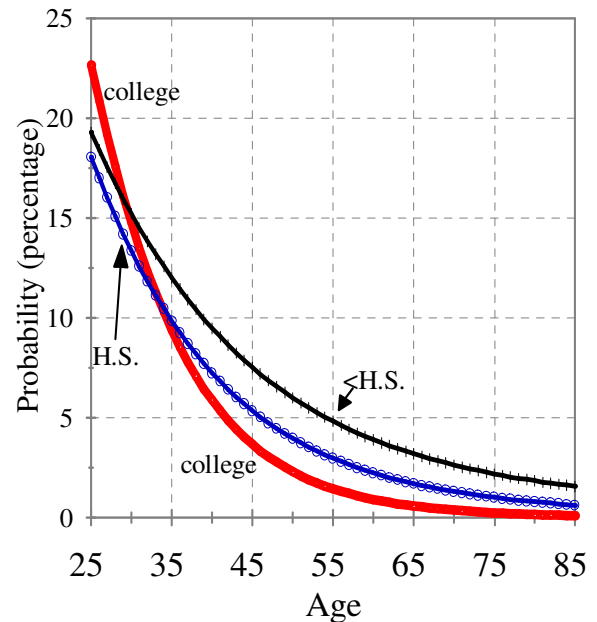
Based on Model 1 logit, Table 3.

Households with a college education and under the age of 35 had a higher probability of having a negative net worth than those with less than a high school education, according to results of the Model 2 logit. Those with college degree who were over age 35 had a lower probability of having negative net worth than those with less than a high school education. Figure 3 shows the

relationship between the predicted probability of negative net worth and age by educational attainment. Households with a college degree are more likely to have a negative net worth during early adulthood, as high as 34% at age 20, compared to around 24% for those with less education.

In the third logistic analysis (model 3), other socio-demographic variables, household financial status variables, expectations and risk tolerances variables, and wealth transfer variables were added in the logit analysis. Age had a significant effect on the likelihood of having a negative worth among households with a college education. Again, the effect was negative. Among other socio-demographic variables (marital status, race, and household size) and measures of household financial status, expectations and risk tolerances, and wealth transfers, only race had a significant impact on the probability of having a negative net worth.

Figure 3:
Age Effect on Predicted Probability of Negative Net Worth by Educational Attainment.



Based on Model 2 logit, Table 3, assuming all variables other than age are at mean values..

Current household income had a negative effect on probability of negative net worth. If the respondent was

a full-time worker or the household owned a home, they were less likely to have a negative net worth. Other financial status variables (job security and liquidity constraints) did not have a significant impact. Households which have received or expected to receive an inheritance or other substantial assets were less likely to have a negative net worth.

Table 2
Household Balance Sheet of the Sample and of Households With a Negative Net Worth and Households With a Non-negative Net Worth

	Entire Sample		Households with negative net worth		Households with non-negative net worth	
	Amount	%	Amount	%	Amount	%
Assets						
<i>Financial Assets</i>	67,256	30.5	1,247	10.4	72,377	30.6
Liquid assets	11,898	5.4	591	4.9	12,775	5.4
Certificates of deposit	5,477	2.5	19	0.2	5,901	2.5
Retirement funds	16,383	7.4	274	2.3	17,633	7.4
Stocks	11,165	5.1	33	0.3	12,029	5.1
Mutual funds	5,169	2.3	18	0.1	5,569	2.6
Bonds	5,756	2.6	0	0	6,202	2.6
Saving Bonds	785	0.4	68	0.6	841	0.4
Cash value of life-insurance	4,205	1.9	135	1.1	4,521	1.9
Other financial assets*	6,428	2.9	109	0.9	6,907	2.9
<i>Non-Financial Assets</i>	153,308	69.5	10,785	89.6	164,365	69.4
Vehicle	8,477	3.8	3,667	30.5	8,851	3.7
Houses	69,993	31.7	5,912	49.1	74,964	31.7
Real estates assets	32,891	14.9	686	5.7	35,390	14.9
Business assets	39,536	17.9	427	3.5	42,570	18.0
Other Nonfinancial assets	2,411	1.1	92	0.8	2,591	1.1
<i>Total Assets</i>	220,565	100	12,031	100	236,742	100
Liabilities						
Housing debt	23,047	64.2	5,087	25.7	24,441	65.5
Home equity loan	260	0.7	98	0.5	273	0.8
Real estate debt	7,116	19.8	373	1.9	7,639	20.8
Credit card debt 1,014	2.8	1,875	9.5	948	2.6	
Education loans	739	2.0	5,131	26.9	392	1.0
Other Installment loans	2,940	8.2	6,149	31.0	2,697	7.3
Other debts	792	2.2	1,101	5.6	768	2.0
<i>Total Liabilities</i> 35,909	100	19,814	100	37,157	100	
Net Worth	184,656		-7,782		199,585	

* Other financial net worth includes trusts, annuities, managed investment accounts and others.

The results derived are only as good as the data used in the analysis. It is possible that some of the assets and debts were not accurately measured in the data set, since the amount is collected based on respondents' answers. Some unique assets and debts might not be included in the survey. Business cycles also have impact on a household's net worth level, however, this impact was unable to be reviewed, as the 1992 SCF only covered a brief period.

Discussion And Conclusions

Table 2 indicates that households with negative net worth have a much higher percentage of assets tied up in the necessities of life (housing and transportation) than households with non-negative net worth, 77% vs. 35%. On the liability side, educational debts and installment debts represent 58% of total debts for households with negative net worth, compared to only 8% for households with non-negative net worth. These indicate that a considerable portion of households with negative net worth are using debt to finance living necessities and education, which is the typical prediction of the life cycle

hypothesis on young households.

The effects of age and educational attainment on probability of negative net worth are consistent with the life cycle hypothesis. Those groups (young, well educated) which expect to see their incomes rise in the future are more likely to borrow while young to increase their standards of living. The fact that college graduates are more likely to have a negative net worth during young adulthood is also consistent with the fact that many college students take low interest rate student loans to finance their education. However, the age effect is not as strong as predicted by the life cycle model, especially among groups with lower educational attainment. This could be due to the fact that young people with lower educational attainment expect a lower increase in their income than those with a college degree. They do not want to borrow heavily for current consumption because they may be unlucky, and not do as well as expected.

Table 3
Logistic Analysis of Having a Negative Net Worth, 1992
Survey of Consumer Finances.

Variables	Model 1 Coef.	Model 2 Coef.	Model 3 Coef.
Intercept	1.100†	0.164	-0.822
Age	-0.115‡	-0.069†	0.022
Age ² /100	0.057†	0.022	-0.058
College		1.406*	1.570†
High School		-0.269	0.392
Age*College		-0.048†	-0.029*
Age*High school		-0.014	0.008
Married			0.154
White			0.013
Black			-0.155
Others			-0.952*
Household size 1			-0.190
Household size >=3			0.228
Income(1991)(1000)			-0.020‡
Full-time			-0.295*
Job security			-0.010
Self Employed			-0.108
Homeowner			-2.025‡
Credit card limit			7.5E-6
Line of credit limit			-1.5E-5
Substantial risk			0.083
Above average risk			0.180
No risk			0.115
Expected income			0.078
Expected interest rate			-0.060
Expected economy			-0.253
Inheritance			-1.013‡
Expected Inheritance			-0.588†

*p<.05 †p<.01 ‡p<.001

Results for those who have received an inheritance are

also consistent with life cycle theory. Those who have received an inheritance or other wealth transfer are less likely to borrow to smooth consumption early since they already have assets to draw on.

Other results are more difficult to explain within a life cycle framework. The reduced likelihood of having a negative net worth for householders who work full time and homeowners makes intuitive sense, since both activities are associated with financial stability. However, according to the life cycle model, those who expect a constant or increasing flow of income may be more likely to borrow while young. Conversely, those who are out of work but can expect to work in the future may borrow to maintain a constant standard of living. Young households expecting rising incomes should be more likely to borrow heavily for housing, yet loan qualification standards make acceptance difficult for those with a negative net worth.

The negative effect of expected inheritance on probability of negative net worth is opposite to that predicted by the life cycle hypothesis, i.e., those who expect to receive an inheritance or other wealth transfer should increase their current consumption when they expect a substantial increase in future wealth. This could be due to the fact that households that expect an inheritance have parents with wealth. Parents with wealth may be more likely to provide assistance for education or during a period of unexpected financial turmoil. This result is consistent with the prediction of Wolff (1980) and Sinha (1988). Another explanation could be that the uncertainty about when and how much will be received reduce the effect of the expected inheritances on households' consumption and saving behaviors.

Results show that risk tolerance did not affect the probability of having a negative net worth. This seems counter-intuitive, since risk averse persons should be less likely to borrow themselves into a possibly dangerous financial position. This could, perhaps, be due to the fact that the variable is not a good proxy for people's true risk aversion, i.e., it is more a measure of people's financial situation. In other words, people with negative net worth who are less likely to take a risk may be willing to take great risks if given the luxury of having a highly positive net worth. Risk levels may also be low in cases where persons are unwilling to take any risk for higher return because they haven't been exposed to investment theory.

An assumption of the life cycle hypothesis is that households can borrow as much as they need at the same interest rate as lending. Prudence on the part of lenders in the real world may contribute toward the insignificance of a few characteristics. For example, the expectation variables (expected income and expected economic growth) are insignificant predictors of negative net worth. The two proxies, limits of credit card and line of credit, may not accurately represent the credit constraint faced by the household. Deaton (1992) argued that credit cards and bank line of credit will be a strict constraint if one wants to borrow. It is often the case that those who prefer to consume more heavily early in life and who expect income to increase in the future are most likely to be unable to find loans to carry out such a plan. Those who expect their income to improve greatly in the future may not be able to convince a lender unless they have readily observable evidence, such as a good education, that high expectations will come to fruition.

These results indicate that the life cycle hypothesis provides some insight on household debt behavior. The results are consistent with Wolff's (1980) and Sinha's (1988) conclusion -- the life cycle hypothesis is more powerful in explaining the behavior of well educated middle classes. For the life cycle model to provide a good explanation of the wealth accumulation for all population groups, a more complete model of life cycle theory and negative net worth would need to include more detailed effects of personal preference toward current and future consumption, interest rates, liquidity constraints, insolvency laws, and even welfare eligibility rules for the poor. However the life cycle hypothesis does a relatively good job at predicting observed behavior based on this model.

Financial counselors should bear in mind that young, well-educated households may rationally choose to borrow heavily against future earnings. Many of them need to borrow to increase current consumption or finance their educations in their early adulthood. More than 50% of all the debts borrowed by households with a negative net worth were educational loans and consumer installment loans. Borrowing in excess of assets, often seen as a sign of bad financial planning or lack of will power, may be appropriate in some situations, particularly when establishing a household or financing higher education. The findings of this study also indicate that most well educated young households will be able to turn the negative net worth into positive

in a relative short time period.

Households who choose to have a negative net worth are fundamentally different from those households that are forced to have a negative net worth. It is important for financial professionals to realize the difference. However, consumers should be urged to carefully consider the uncertainty of projected future earnings when considering whether to borrow heavily in early adulthood. It might not be appropriate for a household with a substantial uncertainty in future earnings or a low risk tolerance level to borrow into a negative net worth. Counselors should keep in mind the projected earnings stream, the type of debt incurred (high interest rate installment versus educational or bank loans), and the specific goals of the household before prescribing proper saving and borrowing behavior.

Possible future research may include panel data to investigate many factors ignored in this study, such as the impact of a change in family structure on having a negative net worth. Panel data would also aid in the division between households who rationally choose to have a negative net worth and those who are simply poor.

Endnotes

- a. Interest rates, among other factors, will influence the decision to save or dissave within different time periods.
- b. Probit was also conducted. The results were very similar, however, only logit results are reported.
- c. The predicted probability is calculated by P_i (negative net worth) = $[e^{Xb}/(1+e^{Xb})]$, where Xb represents the linear forms of parameter estimates (Maddala, 1992).
- d. The ratio between the odds of one event taking place versus the other event taking place, i.e., $P/(1-P)$.

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