A Hierarchy of Financial Needs Reflected by Household Paper Assets

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Through preliminary examinations and tobit results, with data from the 1983 and 1986 Surveys of Consumer Finances, shares of household paper assets among income groups indicated distinctive patterns that suggested a hierarchy of family financial needs. Based on the findings, a cosine function that describes family saving patterns, and a model indicating associations between family financial needs and financial instruments are proposed.

Numerous personal finance books and articles discuss family financial needs which motivate savings and appropriate financial instruments, and give insightful recommendations for setting family financial plans (for examples, see Garman and Forgue, 1991; Kapoor, Dlabay, and Hughes, 1991). However, few empirical research is found to address relationships between family financial needs and financial instruments.

This study attempts to fill the research gap. The research purpose is to investigate associations among family financial needs, saving motives, and family possessed financial assets. Specifically, this study is to identify family saving patterns and explore the match of financial needs and instruments, using data from surveys of consumer finances.

Literature Review

Saving Motives

In economic literature, saving motives are implied by several saving models. Retirement as a saving motive is suggested by the life-cycle hypothesis (Ando and Modigliani, 1963; Modigliani and Brumberg, 1954). This model states that saving is mainly done for retirement. Another saving motive, intergenerational transfer, is implied in Barro's (1974) model. Barro views individuals as caring not only about their own welfare but also about their offsprings, and their major savings are for their children (Kotlikoff, 1989, p.5). The third saving motive proposed by economists is for precautionary saving. Two forms of precautional saving, for uncertain life span and for uncertain health expenditure are examined (Kotlikoff, 1989, pp.109-162). This saving motive could be labeled as "for emergency".

In the view of personal finance researchers, the above models have several limitations. First, each model always considers only one saving motive when examining consumer saving behavior. Second, these models treat different components of savings as interchangeable. To improve this fungibility (interchageability) assumption, Shefrin and Thaler (1988) have proposed a behavioral life-cycle hypothesis, which suggests that consumers' marginal propensities to consume from different accounts are different, which infers varying saving motives. This model implies that consumers treat their different saving components in a dissimilar way. However, this model fails to tell why consumers behave like this.

Needs Theories

While a well-known economist Marshall proposed six levels of wants (see Haines, 1990), the most influential needs theory was developed by Maslow (1954). Maslow's theory is widely applied in the organizational behavior field. The outstanding development and elaboration of Maslow's theory in the organizational setting were provided by Alderfer (1972; 1989).

Research on the relationship between the human needs and family financial decisions is rare. One relevant study is Tang (1992). Based on Maslow's theory and other needs theories, He has developed an instrument to explore the meaning of money and found that money is related to the perception of achievement, respect, and freedom.

Family Financial Needs

Personal/family financial needs are addressed in numerous personal finance textbooks (Boon and Kurtz, 1989; Garman and Forgue, 1991; Gitman and Joehnk, 1987; Kapoor, Dlabay, and Hughes, 1991; Winger and Frasca, 1989). While textbooks and practitioners give consumers advice and recommendations regarding how to achieve financial goals with alternative financial instruments, empirical studies on this topic are scarce.

There are two exceptions: Weagley and Gannon's (1991) investigation of investor portfolio allocation and Xiao and Olson (1992)'s study of household asset portfolios. However, both studies only address the relationship between financial needs and financial assets in an indirect way.

Based on the literature review, it can be

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concluded that few studies directly explore the associations among family saving motives, financial needs, and matched financial instruments. This study attempts to explore this issue.

Conceptual Framework

The conceptual framework will be based on the needs theory. According to this theory, human needs: (1) are hierarchical (Maslow,1954); (2) move up to a higher-level need after the lower-level need has been met (Maslow, 1954); (3) have following features. Within the deficiency range, the more people get, the less they want; beyond a certain degree of satisfaction, the more people get, the more they want (Alderfer, 1989).

According to above notions, a chart could be drawn, the horizontal axis is motivator, and the vertical axis is indicator of needs. Along with the increase of the motivator, the indicator's lotus will show three possible shapes: (1) a mirror-image-J-shape; (2) an inverted-U-shape; and (3) a J-shape.

In this study, several assumptions are proposed. Motivations for current and future consumption are defined as financial needs. Family financial needs are the reflection of human needs, then having the same characteristics mentioned above. These family needs are expressed by family financial behavior, such as consumption activities and savings. If these assumptions are held, consumer expenditures and savings in different categories will show hierarchies as the same as in human needs.

In economics textbooks, hierarchies indicated by consumer expenditures are obvious. For example, goods are classified as inferior or normal goods, when the relationship between the demand and income is observed (Varian, 1990, p.96). Another example is the classification of luxury good and necessary good when the demand for a good increases more or less rapidly than income increases (Varian, 1990, p.101). In these two examples, income serves as the motivator, and the demand for goods is the indicator of financial needs.

Hierarchies of savings are not explored by economists, because dominant saving models hold the fungibility assumption. Based on the assumptions of this study, hierarchies in saving components should be observed if variables are appropriately chosen. Savings include paper assets, real assets, durable goods, and other assets (such as pensions, annuities). To simplify the analysis, only paper assets are considered here. Two candidates for the indicators are amounts and shares of different paper assets. Preliminary examinations show that shares of assets are a better indicator, then, used in this study.

Motivator can be income, net worth, wealth, life cycle, etc. Since paper assets are considered as the indicator in this study, and these assets accounted for a certain proportion in the total savings, net worth and wealth variables are not appropriate to be used as motivator. The family life cycle variables were used to effectively explain family expenditure behavior (Lansing and Kish, 1957). Empirical findings showed that the life cycle variable was significant in explaining family expenditure behavior, but much weaker than the explanatory power of family income (Wagner and Hanna, 1983). Consequently, income is used as motivator.

In sum, household paper assets are assumed to reflect hierarchical family financial needs, as predicted by the framework. However, what are these financial needs, and what financial instruments are for what needs? The work in the following sections tries to answer these questions.

Methodology

Data

Panel data from the 1983 and 1986 Surveys of Consumer Finances were used. In the sample, household heads who did not change spouse, or did not change single status between 1983 and 1986 were chosen. All were homeowners. In the following investigation, both unweighted and weighted samples were used, while the results from the weighted sample are usually reported. Thus, the results from the weighted sample are nationally representative of homeowners who had no marital status changes between 1983 and 1986. The unweighted sample size was 1,954 and the weighted was 57,264,470.

Variables

The dependent variables were eight paper assets, CHCK(saving and checking accounts), CD(certificates of deposit and money market accounts), LIFE(cash value of life insurances), IRA(individual retirement and Keogh accounts), THRFT(profit sharing, thrift and other saving plans), OASST(other assets), BOND(bonds), and STCK(stocks). Definitions of these variables are the same as Avery and Elliehausen (1988). The share of CHCK in the sum of paper assets (SUM) was figured out as follows:

$$\text{Share of CHCK} = \frac{CHCK_{83}/SUM_{83}+CHCK_{86}/SUM_{86}}{2}$$

Where the subscripts 83 and 86 mean the values in 1983 and 1986, respectively. Shares of other assets were calculated in the same way. Using average shares was believed to give a relative "steady" picture of family financial needs.

Family income was used as a major influential factor (motivator) in the change of family financial needs. To capture the behavior of families with a relatively stable income flow in a period of time (three years in this study), average annual income (INCOME) based on 1983, 1984, and 1985 data was used.

To investigate the matches between family financial needs and paper assets, some life-cycle related variables were chosen. Age and marital status of the household head were used to examine relationships between life cycle and life arrangement, and corresponding financial assets. Number of children (who lived in and outside the household) was used to investigate financial instruments saved for children's sake.

Saving reasons were variables that would show associations between different financial needs and varieties of paper assets. The data used to form this variable were from answers of respondents to an open-ended question "What were the household's most important reason for saving?" The respondents might give several reasons. In this study, respondents' first stated reason was used. Then this variable showed the most important saving reason perceived by the respondents. Based on the 35 categories of answers coded by previous researchers (Avery and Elliehausen, 1988), the authors of this study recoded these reasons as follows: (1) for daily expenses; (2) for emergency; (3) for purchase plans, such as for self-education, travel, wedding, second house, home improvement, and so forth; (4) for retirement; (5) for children or grandchildren; (6) for better life, advancing standard of living, or other abstract reasons. This reason was labeled "growth" in this study; (7) no savings, don't know, or not applicable.

Procedures

Two steps were used in this study. First, INCOME was broken into ten levels, and average shares of paper assets by income levels were calculated. INCOME was divided almost evenly among the unweighted sample, then weights of 1986 were employed to produce results. The reason for doing the former was to take full advantage of this data set since it oversampled high-income families. Doing the latter was to get results representative of the national population. Through this step, the behavioral patterns of consumers in regard their shares of paper assets were shown distinctively.

Secondly, shares of paper assets were regressed with several independent variables, including average income, age and marital status of the household head, number of children, and saving reasons, using tobit models. The reason for using tobit models was that some families had no certain types of paper assets, then tobit models can generate unbiased estimates when these censored samples were included (Mandala, 1983).

Results and Discussions

Average Shares of Paper Assets by Income Levels

ANOVA were conducted between asset shares by income levels and results were significant ($p \leq .0001$). These findings are available from the authors. To illustrate the findings more straightforwardly, trimmed curves showing the relationship between asset shares and income levels, based on the findings, were drawn in Figures 1 to 3. Three patterns were shown. In Figure 1, the share of CHCK decreases when the income level goes up. At income level 1 (≤$7,334), the value of CHCK accounts for more than 52% of the total value of paper assets. However, for families at income level 10 (≥180,001), the value of CHCK accounts for only less than eight percent of the total value of paper assets. It implies, CHCK is a financial instrument that consumers need relatively less as they become more affluent.

Figure 1
Shares of Paper Assets by Income (I)

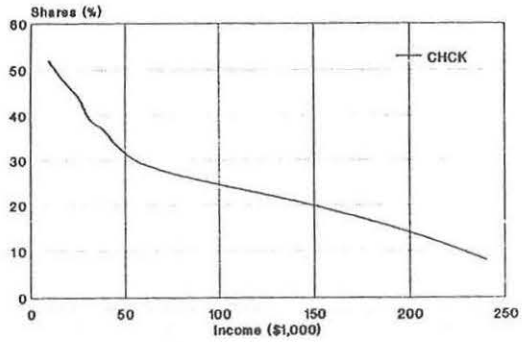
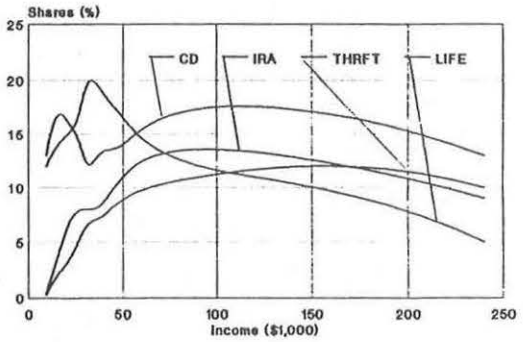


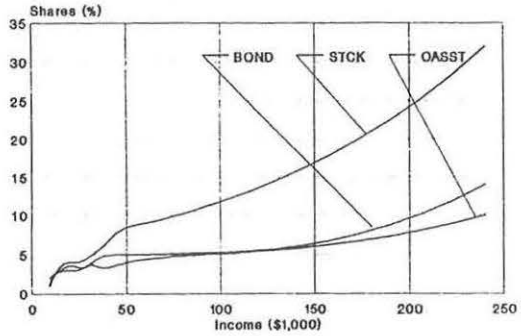
Figure 2
Shares of Paper Assets by Income (II)



In Figure 2, CD, LIFE, IRA, and THRFT showed similar patterns. First look at LIFE, IRA, and THRFT. Three of these assets showed an inverted-U-shape pattern. It suggests that at first as consumers' incomes grow, they get more and need more. But beyond a certain point of income level, they get more and need less. The CD's curve showed two peaks. According to the same line of reasoning, the curve for CD could be viewed as a combination of two inverted-U-shape pattern.

OASST, BOND, and STCK demonstrated a third pattern in Figure 3, a J-shape curve. It seems that, relatively, when consumers get more OASST, BOND, and STCK, they need more.

Figure 3
Shares of Paper Assets by Income (III)



The above findings showed three distinctive patterns of paper asset shares along with the growth of income. Based on the assumptions in the framework section, these patterns could be explained as a hierarchy of financial needs. The first pattern, a mirror-image-J-shape curve represents the most basic financial need. It may be labeled as "survival need". This explanation seems reasonable because (1) almost all families have CHCK (checking and saving accounts); (2) checking accounts are always used as an instrument to receive family regular incomes (through automatic deposit services), and to deal with daily expenses (make mortgage, credit card, or other routine payments); (3) CHCKs are critical even to some families without stable income sources. That is why lifeline bank service has been selected as an important consumer issue (Garman, 1991).

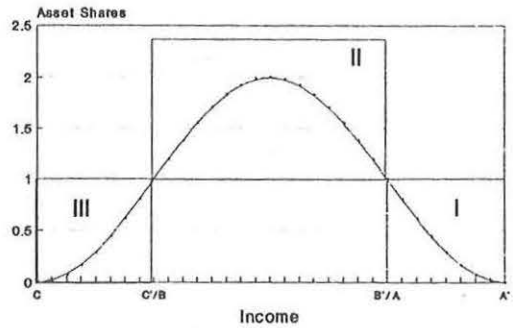
The inverted-U-shape curve could be explained as representing "security need". IRA and THRFT are obviously related to retirement, the future financial security. LIFE concerns the financial security of the family in case of the death of family's breadearner(s). These needs are specific and can be saturated. Then, when the savings for these needs are achieved to a certain amount, consumers will generate another higher level of needs, and start or accelerate accumulating other accounts. This process will be shown an inverted-U-shape in a plane of asset shares and income levels. CD showed two peaks in Figure 2. It could have two explanations. First, CD may serve to meet two different needs. Since CD is a combination of certificates of deposits and money market accounts, these two peaks may imply these two components meet two different financial needs. Another possible explanation is that CD may be used to serve one need, and when the income increases further, CD once again serves another higher level of need. Both needs are achievable and can be saturated.

According to the relative location of these four curves, CD, LIFE, IRA, and THRFT could be distinguished as finer layers within this level of need. If a peak implies the saturation of a need, then the faster a peak has been achieved, the lower the need level. According to this rule, CD represents the lowest need and THRFT the highest within the second level of need, the "security need".

A J-shape pattern represents an unsaturated need. Relatively, consumers get more and want more. This level of need could be labeled as "growth need". This need represents achievement and self-actualization. According to the relative locations of OASST, BOND, and STCK, they could also be divided as hierarchical within this level. The OASST represents the lowest need and the STCK the highest.

A cosine function can be used to describe the relationships between asset shares and income levels. This cosine function combines three patterns into one chart and is convenient for the purpose of exposition. In Figure 4, a locus of a cosine function is shown. It is divided into three part, part I to III, which correspond to three types of saving patterns discussed above. The X-axis represents the growth of income, where A<A', B<B', and C<C'. The Y-axis represents the relative magnitudes of asset shares.

Figure 4
Saving Patterns



Three distinctive patterns are shown in the plane of asset shares and income levels, and they are labeled as survival, security, and growth need, respectively. These financial needs are hierarchical. Recall the saving reasons discussed above, there are not many clues to relate different saving reasons with varieties of paper assets. To explore the match of financial needs and financial instruments, the results of tobit models should be examined.

Results of Tobit Estimates

Shares of CHCK, CD, LIFE, IRA, THRFT, OASST, BOND, and STCK were regressed with average annual income, age and marital status of the household head, number of children, and saving reasons, with tobit models. All independent variables but income

were dummies. Income variables were constructed in several ways when different assets were treated. These different treatments were inspired by different behavior patterns shown in Figures 1-3. Specifically, several income variables entered tobit models after some transformations were done:

$$INC0=1/INC$$
$$INC1=INC$$
$$INC2=(INC)^2$$
$$INC3=(INC)^3$$
$$INC4=(INC)^4$$
$$INC5=e^{INC}$$

where INC is an average of 1983, 1984, and 1985 annual household incomes, dividing by 100,000. For example, if the three-year average annual income is $40,000, INC=.4.

Both unweighted and weighted samples were used to estimate parameters of tobit models. Estimates of those weighted samples were all statistically significant ($p \leq .0001$) and presented in Table 1.

In order to explore the match between financial needs and paper assets, attention was paid to parameter estimates of life-cycle variables and the saving reason variable. In the case of share of CHCK, compared to consumers who claimed no savings, consumers stated that savings for daily expenses tended to have a larger share of CHCK among the total value of paper assets, and those stated that savings for other reasons tended to have smaller shares of CHCK, given other conditions. This is consistent with the discussion last section. It gives support to the argument that CHCK was used for survival need.

IRA and THRFT were considered to be related to consumers' retirement needs. This argument was supported by the estimates of number of children. Presence of children decreased the shares of these two assets. Another piece of evidence was from age of household head. Compared to consumers at retirement age or older, consumers before retirement tended to have larger shares of these two assets. There was a minor difference between these two assets. For IRA, when consumers grew older toward retirement, their shares of IRA tended to be larger, compared to the retirement group. For THRFT, this tendency was a reverse one. Estimates of saving reasons showed that consumers stated retirement reasons as the most important reason tended to have largest share of IRA and THRFT.

Estimates of LIFE implied that consumers bought life insurance mainly for retirement and children. Consumers stated that savings for children and retirement tended to have a larger share of LIFE, compared to those had no savings. Compared to consumers at retirement age, younger consumers, especially the age group of 41-55, tended to have larger shares of LIFE. Estimates of number of children were interesting. Compared to consumers with no children, consumers having one to three children tended to have a larger share of LIFE, which was consistent with the statement that purchasing life insurance for children's sake. However, consumers with four or more children tended to have a smaller share of LIFE. It implied that there was a trade off between quantity and quality of children. Married consumers tended to have a larger share of LIFE than single consumers, which was consistent with the argument that LIFE was related with the financial security of the family. One point should be noted here was the distinction between savings for children and savings for family financial security. The former represents an intergenerational transfer, an indicator of self-actualization and a form of growth need. And the later suggests a lower level of need in case of the sudden death of family breadearners. Further explorations are needed to distinguish these two different levels of needs and corresponding financial instruments.

CD once again showed its complexity. Looking at estimates of saving reasons, CD could be used for any of those financial needs, especially for children, retirement, growth, purchase plans, or emergency. Estimates of number of children implied that consumers having no children tended to have a larger share of CD. This finding was consistent with the estimate of marital status of the household head. Estimates of age of the household head suggested that consumers at retirement age tended to have a larger share of CD. It seems that CD is a favorite financial instrument for single, retired consumers without children. To consider all these findings together, it is safe to say that CD is at least saved for retirement, growth, purchase plans.

Estimates of OASST suggested its multiple functions for meeting family financial needs. Estimates of saving reasons implied that it could be used for growth, emergency, retirement, or purchase plans. Consumers at retirement age or married consumers tended to have a larger share of OASST. Consumers with four or more children tended to have a larger share of OASST, which was a reverse case compared to LIFE. Not many consumers have OASST (14.3% in weighted sample, and 21.6% in unweighted sample). Consumers with OASST may be at higher income levels. Then the behavioral patterns shown here may indicate the behavioral difference between upper-income families and low- and middle-income families.

Table 1: Estimates of Tobit Models (Weighted Sample)

Variable	Estimate	Estimate	Estimate	Estimate
Y=SHARE OF	CHCK	LIFE	THRFT	BOND
INTERCPT	0.376*	-0.307*	-0.904*	-0.208*
INC0	44.49*			
INC1		-0.016*	0.232*	
INC2		4.7E-9*	-1E-7*	
INC5				2E-18*
AGE OF HOUSEHOLD HEAD				
≤40	0.124*	0.071*	0.473*	-0.007*
41-55	0.043*	0.906*	0.429*	0.019*
56-65	-0.036*	0.067*	0.339*	0.030*
≥66	-	-	-	-
SAVING REASONS				
daily	0.077*	-0.077*	-0.032*	0.059*
emergency	-0.002*	-0.001*	0.056*	0.089*
purchase	-0.079*	-0.028*	0.117*	0.104*
retirement	-0.100*	0.023*	0.170*	0.115*
children	-0.046*	0.034*	0.053*	0.131*
growth	-0.048*	-0.065*	0.124*	0.117*
no savings	-	-	-	-
NUMBER OF CHILDREN				
1-3	0.018*	0.013*	-0.020*	0.013*
4-17	0.052*	-0.025*	-0.015*	-0.035*
no kids	-	-	-	-
MARITAL STATUS				
married	-0.054*	0.225*	0.122*	0.039*
single	-	-	-	-
Y=SHARE OF	CD	IRA	OASST	STCK
INTERCPT	-0.070*	-0.475*	-0.712*	-0.286*
INC1	0.305*	0.098*		
INC2	-6.3E-7*	-3E-8*		
INC3	3.6E-13*			
INC4	-5.5E-20*			
INC5			2E-18*	1E-18*
AGE OF HOUSEHOLD HEAD				
≤40	-0.363*	0.054*	-0.197*	-0.080*
41-55	-0.293*	0.136*	-0.107*	0.032*
56-65	-0.135*	0.195*	-0.017*	0.048*
≥66	-	-	-	-
SAVING REASONS				
daily	0.237*	0.176*	0.154*	0.134*
emergency	0.296*	0.258*	0.304*	0.091*
purchase	0.313*	0.223*	0.240*	0.134*
retirement	0.356*	0.341*	0.257*	0.183*
children	0.375*	0.263*	0.154*	0.106*
growth	0.314*	0.215*	0.311*	0.192*
no savings	-	-	-	-
NUMBER OF CHILDREN				
1-3	-0.061*	-0.084*	-0.010*	-0.048*
4-17	-0.176*	-0.159*	0.068*	-0.131*
no kids	-	-	-	-
MARITAL STATUS				
married	-0.069*	0.114*	0.052*	0.099*
single	-	-	-	-

Note: - reference category, * p<.0001

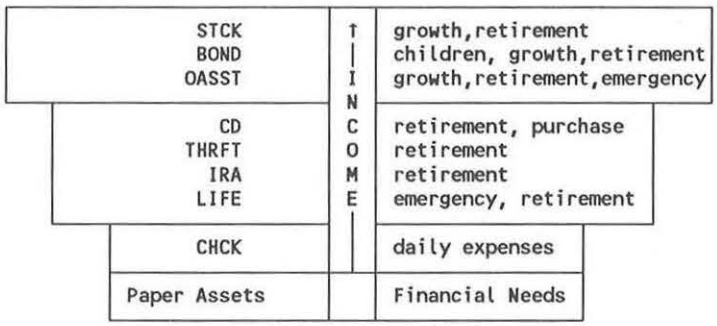
Saving reasons in BOND were for children, growth, retirement, and purchase plans, according to the findings. Married consumers and consumers with one to three children tended to have a larger share of BOND, which was consistent with the case of LIFE, and confirmed once again savings in BOND were for children. Consumers at age 41-65 tended to have a larger share of BOND. This relationship between age of consumers and share of BOND may imply the relationship between income and share of BOND, since age group of 41-65 covers the earning peak of consumers.

Estimates of STCK were very similar to the behavior of BOND in terms of age of the household head. Consumers aged 41-65 tended to have a larger share of STCK. Differences were shown in saving reasons. Estimates showed that savings in STCK were for growth, retirement, and purchase plans. Another difference between share of STCK and BOND was shown in number of children. Consumers without children tended to have a larger share of STCK, which suggested that STCK was not mainly for children.

Estimates of tobit models gave some clues about the match between family financial needs and household assets, though it was far from enough. Discussion of tobit estimates showed that sometimes certain assets can serve several financial needs, even needs at different levels. Another point that suggested in the previous discussion is that certain paper assets may meet different financial needs under different family contexts.

The topic explored in this study is logitudinal in nature, but findings and discussions are based on a virtually cross-section sample. This limitation should be noted befor the findings are summarized. Findings in this study suggest the associations between financial needs and paper assets. Along with the growth of family income, family financial needs go up to a higher level. Varieties of financial instruments can be used to meet these diverse needs. These findings are incorporated as a model shown in Figure 5.

Figure 5: A Model of Relationships between Family Financial Needs and Household Paper Assets



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