

Desired Precautionary Savings in the U.S.

This study examines the factors that affect consumers' precautionary saving behaviors by using the data from the 1995 Survey of Consumer Finances. Due to the heteroscedasticity among the variances of disturbances, the generalized least squares (GLS) method is used. The findings reveal that age, gender, number of children, working years, education, occupation, race, permanent income, current income, net worth, credit constraints and social security benefits are significant factors that determine consumers' precautionary savings.

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Introduction

To simplify the economic models, the pure life cycle permanent income hypothesis (LCPIH) assumes that people live in an environment of certainty. Individuals will not face the problems of uncertainty in their lifetime. Hence, precautionary saving behaviors have been ignored in earlier economic models.

After the life cycle permanent income hypothesis was found to be inconsistent with empirical evidences, precautionary savings have been concluded as one of the main factors to induce the failure of LCPIH in many empirical studies. For examples, young people would not incur debt for current consumption although the increases of their future income are expected due to the accumulation of human capitals. And, the old would hold savings as LCPIH predicted. Since then, the precautionary saving has become an important issue in economic research.

Because of the importance of precautionary savings, researchers have put a lot of effort to study consumers' precautionary saving behaviors for the last ten years. As precautionary saving behaviors were not observable in previous studies, proxy variables such as saving rates, consumption growth rates, and the log value of the ratio of net worth to permanent income have been used. Hence, the measurement errors become inevitable.

The purpose of this study is to examine the factors that determine consumers' precautionary savings by using observable variables. The findings will enhance our understanding about consumers' precautionary saving behaviors.

Literature Review

Under the assumption that the utility function was constant relative risk averter, Skinner (1988) found that precautionary savings accounted for 56% of total savings in the U.S. Moreover, he concluded in his later study (1990) that consumers' precautionary saving behavior was the major reason to cause the high saving rates in 50's and 70's, and the low saving rate in 80's.

The life-cycle permanent income hypothesis assumes that individuals are rational. Consumers are always forward-looking. Household consumption and saving are only determined by permanent income. Current income has no effect on consumers' saving behaviors. However, according to the studies done by Blanchard and Mankiw (1988), Kimball and Mankiw (1989), and Alessie and Lusardi (1997), current income significantly affects precautionary savings.

Kazarosian (1994) found that there was a hump-shaped relationship between age and the wealth accumulated for uncertainties. Carrol and Samwick (1995) also pointed out that people saved for the reason of uncertainties when they were under age 50. They did not save for retirement until they were 50. Abel (1985), Modigliani (1988), and Skinner (1988) concluded that individuals had inheritance because they did not spend all of their precautionary savings before they died.

There is a positive relationship between precautionary savings and income uncertainty (Leland, 1968). Many studies have used occupations as a proxy to measure income risk. Fisher (1956) and Sandmo (1970) found that self-employed individuals who had higher income risk would have 12% more of precautionary savings than

those who had a professional occupation. However, Skinner (1988) concluded that people who had occupations with higher income variances had less savings. It was because risk-taking consumers would have lower savings. And, these risk-taking consumers were more likely to select the occupations that had higher income uncertainties. It was so-called self-selection tendency. According to Carroll and Samwick's (1998) study, farming, forestry, and fishing occupations had the highest income variances. The second high income variance occupation was laborers. Managerial and professional occupations had the lowest income variances.

Using the data from 1984 Family Expenditure Survey, Dardanoni (1991) estimated precautionary savings by emphasizing the income variance among different occupations. He found that 60% of consumers' savings were prepared for future income uncertainty. Merrigan and Normandin (1996) also concluded that households with higher income uncertainty had more savings than their counterparts by analyzing the data from the 1968-1986 Family Expenditure Survey. The other findings from their study included that households with credit constraints had weaker motivation for precautionary savings. The number of earners was positively related to precautionary savings.

In the studies of liquidity constraints, Deaton (1992) argued that precautionary saving behaviors would be strengthened by credit constraints. Wu (1995) also concluded that the existence of credit constraints had effects on consumers' precautionary saving behaviors. And, the behaviors would continue until consumers accumulated enough assets or they would not have credit constraints. However, Dynan (1993) found that households with credit constraints were not necessary to be those who had precautionary saving motives. Credit constrained consumers would rather postpone their future consumption than reduce their current consumption.

Using partial equilibrium models to analyze the relationship between social securities and precautionary savings, Abel (1985), Kotliff, Shoven and Spivak (1987) and Hubbard & Judd (1987) found that social securities significantly reduced income uncertainties. It made consumers save less for precautionary reason and indirectly caused the drop of saving rates. In addition, Hubbard, Skinner and Zeldes (1995) found low-wealth individuals had less precautionary savings in order to qualify as the recipients of welfare benefits.

Methodology

Data

The Panel Survey of Income Dynamics (PSID) and the Consumer Expenditure Survey (CES) are the most popularly used data sets to study precautionary savings. But, precautionary savings can not be observed in these data sets. The measurement errors in earlier studies become inevitable.

To avoid the measurement errors in previous studies and to achieve the purpose of this study, the sample for this study is from the 1995 Survey of Consumer Finances (SCF). The SCF contains detailed information regarding the financial, demographic, and attitudinal characteristics of respondents. It also includes the observable data of precautionary savings. The final sample contains 2,818 observations. The following households are excluded: households who contain unrelated people (34 cases), households with negative income before tax or labor income (92 cases), respondents are unemployed¹ (1,102 cases), respondents are more than 65 years old (253 cases).

Variables

The dependent variable is the dollar amount of precautionary savings which are based on one question in the SCF: About how much do you think you need to have in savings for unanticipated emergencies and other unexpected things that may come up?

Precautionary Savings could be estimated through demographic variables and economic variables. According to the review of literature, the proposed determinants of precautionary savings are age, gender (Hefferan, 1982; Carroll & Samwick, 1998; Lusardi, 1998), number of children (Carroll & Samwick, 1997; Gusio et al., 1992; Kazarosian, 1994), working years for current job (Lusardi, 1997), education (Sullivan & Fisher, 1988; Kazarosian, 1994; Carroll & Samwick, 1997), marital status (Sung & Hanna, 1996; Carroll & Samwick, 1995; Hefferan, 1982; Merrigan & Normandia, 1996), occupation, race, permanent income², current income, net worth (Carroll &

¹ Occupations will be used in this study to measure the income risk. Those who are out of the labor market are discarded in the analysis. In these omitted households, 61.7% are retired, 11.5% are disabled, 10.2% are unemployed, 7.8% are homemakers, 2.7% are students, and 6.1% are others.

² The permanent income is constructed based on the study of Guiso, Jappelli and Terlizzese (1992). Due to the limitation of paper length, the information is only available upon request.

Samwick,1995, 1998; Guiso et al., 1992; Kazarosian,1997; Lusardi, 1997), ability to borrow (Jappelli,1990), and dollar amount received from social security benefits savings (Hubbard et al., 1995; Engen & Gruber, 1995; Kantor & Fishback, 1996).

Results and Discussion

The average desired precautionary savings is US \$13,080. Table 1 gives the results of the GLS analysis of precautionary savings mode. Several explanatory variables are found to be significant and in the predicted direction.

Table 1.
Results of GLS Analysis (N=2,818)

Variables	Coefficients	T Value
Intercept	0.69369	1.350
Age (Age<25)		
25<=Age< 35	0.78870 *	1.958
35<=Age< 45	0.97425 *	2.192
45<=Age< 55	-0.63947	-1.279
Age>=55	5.55370***	7.536
Male(Female)	-1.31880***	-3.742
Married(Non Married)	0.00591	0.020
Black(Non Black)	0.79370***	2.670
Education (High School Graduate)		
Less than High School Graduate	1.67160***	3.801
More than High School Graduate	0.12563	0.458
Occupations (Managerial and Professional)		
Sales and Administrative Support	-0.21668	-0.650
Service	0.50659	1.121
Precision Production, Craft, repair	0.61868	1.616
Operators, fabricators, laborers	0.50005	1.199
Farming, Forestry, Fishing	-0.68965	-0.655
Self Employed	-4.48460***	-8.065
Number of Children	-0.22508 *	-2.095
Working years	-0.24959***	-12.360
Permanent Income (US\$10,000)	-0.21731***	-3.056
Income (US\$10,000)	0.55179***	50.966
Incomes (US\$10,000)	-0.00005***	-43.346
Net Worth (US\$10,000)	0.00343***	5.561
Credit Constraints (Not Credit Constrained)	-0.86278***	-3.396
Social Security (US\$10,000)	-0.01658***	-6.144

Note: Variables in () are the omitted variables in the analysis. Breusch - Pagan LM statistics = 290. 846
Adjusted R-squared= 0.62226, *p<.05, ** p <.01, *** p <.001.

Consumers whose ages are 25 to 34 and between 35 to 44 demand precautionary savings US\$7,887 and US\$9,743 more than consumers who are under age 25. Those who are over age 55 demand US\$5,537 more than consumers who are under age 25. The findings indicate that the demand of precautionary savings increases

dramatically once individuals get older. Consumers in their late life stage perceive more uncertainties than young people. This may explain why old people do not dissave and why people unintentionally leave bequests.

Consistent with previous studies gender and race both play important roles in determining consumers' precautionary savings. The male demand US\$13,188 less than the female. Black consumers demand US\$7,937 more than others. The possible reason is that female and black consumers are more insecure about their future life because of discrimination in the job market and difficult financial status. Hence, they demand more precautionary savings for unexpected changes in the future.

There is a negative relationship between number of children and precautionary savings. The finding is consistent with previous studies and the theory of human capital investment. Consumers will demand US\$2,251 less when they have one more child. The effect of reducing uncertainties dominates the effect of increasing uncertainties due to raising children.

Working years for the current job are negatively related to precautionary savings. One more working year will reduce US \$2,496 precautionary savings. People who work longer for their current jobs perceive more secure for their future life.

Same as the findings from Kazarosian (1994) and Carroll and Samwick (1997), individuals whose education is less than high school graduate demand precautionary savings US \$16,716 more than those who are high school graduated. However, there is no significant difference between more than high school graduate consumers and high school graduate consumers. For more educated individuals, educational attainment will not affect their demand for precautionary savings. Education becomes an important factor to determine precautionary savings only for less educated individuals. The possible reason is consumers who have received education at the level of high school graduate or more are not different in the ability to manage their financial crisis. But the crisis-managing ability of less educated consumers is different from that of the higher educated consumers.

Self-employed individuals demand less precautionary savings than managerial and professional workers. The difference is as big as US \$44,846. However, there are no significant differences between other occupations and managerial/professional occupations. The results from this study seem in contradiction to most of previous findings. Nevertheless, they support the self-selection argument brought by Skinner's research in 1988. That is, consumers who are less risk averse have lower saving rates. And, they are also more likely to work for the occupations with higher income variances. Hence, self-employed individuals demand less precautionary savings than managerial and professional workers.

Another important finding from this study is that precautionary savings not only are negatively related to permanent income but also are significantly nonlinearly related to current income. In other words, not as predicted by life-cycle permanent income hypothesis current income actually plays an important role to predict consumers' saving behaviors in addition to permanent income. If current income increases US\$10,000 precautionary savings will increase US\$5,518. But the increase of precautionary savings will hit a maximum and drops later. For low-income consumers, they do not have strong motive to save since necessary expenses already cost most of their income. When consumers have more income, they demand more precautionary savings for guaranteeing their life quality in the future. Once consumers have certain level of current income, their demand for precautionary savings is decreasing since their incomes are enough to cover the unexpected emergencies.

There is a positive relationship between net worth and precautionary savings. But the impact is not so significant. The possible reason is that consumers have the tendency of self-selection. Risk-averse people will have more net worth because they demand more precautionary savings. However, the accumulation of their net worth will not reduce their demand for precautionary savings due to the risk averseness. Moreover, according to the study of Alessie and Lusardi (1997), saving behaviors are also affected by habit formation such as saving behaviors in the past. Consumers with high net worth usually have higher savings than their counterparts. Consequently, net worth and precautionary savings are positively related.

In addition, ability to borrow and social security benefits are important factors to determine consumers' precautionary savings. Consistent with previous studies, the findings show that credit constrained consumers demand precautionary savings US\$8,628 less than their counterparts. Credit constrained consumers do not have the motivation of precautionary savings since they would rather reduce their consumption in the future than postpone their current consumption (Dynan, 1993).

As expected, consumers who receive more social security benefits demand less precautionary savings. The demand for precautionary savings will reduce US\$166 when social security benefits increase US\$10,000. Obviously, the subsidies from social securities help people to be more certain about their future lives. However, it also possibly deters consumers from saving and makes saving rates drop indirectly. Although social security

benefits statistically significantly affect precautionary savings the impact is quite small. Hence, it will not be an effective strategy for the government to cut the budgets of social securities to encourage people to save.

Conclusions, Implications and Limitation

Using the data from the 1995 Survey of Consumer Finances, this study investigates the determinants of precautionary savings in the U.S. The measurement errors in previous studies have been eliminated because precautionary savings are directly measured in this study. The GLS analysis is applied to avoid the heteroscedasticity among the variances of disturbances. The findings show the significant determinants of precautionary savings include age, gender, number of children, working years for current job, education, occupation, race, permanent income, current income, net worth, credit constraints, and social security benefits.

The results of this study could have implications for consumer, economists, educators, and policy makers. First of all, people who are over 55 are those who demand the most of precautionary savings. This finding contradicts Carrol and Samwick's (1995) argument that precautionary savings are held by people under 50. It also solves parts of the puzzles why old people do not dissave and why people leave bequests. Is it right that old people demand the highest precautionary savings? Do people in the states encounter the most uncertainties in their old age? These questions are important for economists and policy makers.

Credit constrained consumers are very possible to have financial difficulties when the unexpected emergencies happen. They are supposed to demand more precautionary savings than their counterparts. However, the evidence shows the unexpected direction. How to educate these people to manage their resources properly is an important issue for financial educators.

The purpose of social security benefits is to help people keep a basic life quality. The finding indicates that the subsidies from social securities make people feel more secure about their lives. However, it costs the drop of precautionary savings. If people really make them qualified as benefits recipients by reducing their precautionary saving as Hubbard et al. (1995) concluded, the welfare system brings another big challenge to policy makers, economists, and educators.

Since the cross-sectional data are used in this study, the income risk is not possible to be measured by variances of income or variances of consumption growth which are mentioned in earlier studies. Although occupations are popularly used to investigate the income risk, the problem of self-selection may reduce the accuracy of measurement. Another limitation in this study is some important factors such as uncertain life span are not included in the model due to the data limitation.

Finally, the present study has done the job of enhancing our understanding about consumers' precautionary saving behaviors that are one of the major factors to explain the failure of the life cycle permanent income hypothesis. It is concluded that economic factors and demographic factors play important roles to predict consumers' precautionary savings. However, how much precautionary savings are consumers supposed to have? Are consumers with high precautionary savings are better off than consumers with low precautionary savings or vice versa? All these related questions are waiting for future research to find the answers.

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Endnotes

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