Employment Instability and Security Funds in U.S. Households

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Abstract : The purpose of this study was to investigate the effect of employment related factors on household savings for precautionary purposes when controlling for financial security and to compare the results between the two different economic periods. A conceptual framework was developed based on the precautionary saving theory, the family stress theory, and previous empirical studies. As a self-insurance, a measure of security funds were developed and used as the dependent variable. Using data on working households in the 1992 and the 1998 Survey of Consumer Finances (SCF), a MLE estimation was conducted on the pooled data. The 1992 and 1998 data were used to reflect periods of economic recession and expansion, respectively.

The results suggested that factors representing resources played the most significant role in determining the amount of security funds. Some of the employment related factors, preferences, financial security, and race were also significantly affected the amount of security funds. The results suggested that stable employment conditions were important for households to accumulate security funds. Households with more human resources and financial resources had a larger amount of security funds than those that had less human and financial resources. From the findings, implications for research, policies, and financial educators had been suggested.

Key Words : security funds, employment condition, precautionary saving theory, self-insurance

I. Introduction

The structure of the U.S. economy has rapidly changed during the last two decades. In response to the changes in economy, the labor market has adjusted with more flexibility in terms of employment and changes in occupations. Corporations have also responded to the changes with restructuring and downsizing, resulting in millions of people out of work (Pennar, Garland,

& Roberts, 1996; Walsh, 1999). Layoffs continued to increase even in the booming economy of 1998 (Sloan, 1998), and, since then, due to the recent economic downturn, layoffs and firings have been intensified (Popper, 2001; Welch, 2001), making the job market worse than before.

The changing face of job loss in the United States can be characterized as a decrease in job duration and an increase in vulnerability to layoffs experienced by white-collar workers, more highly

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educated workers, and older workers - all of whom enjoyed stable employment status 20 years ago (Blau, Ferber, & Winkler, 1998; Farber, 1996). Although the changing face of job loss has been recognized, the labor income risk caused by increases in employment instability is a relatively recent phenomenon for some households (Farber, 1996). Moreover, most households usually do not anticipate an income interruption due to a sudden loss of job. Even when households expect it, financial planners claim that, in general, Americans have not prepared themselves well enough for a sudden loss of income (Welsh, 2001). However, uncertainty in future labor income is one of the fundamental risks that households face in the current economy (Engen & Gruber, 1998; Zeldes, 1989). Additionally, the decline of employment stability has raised uncertainty about labor income which has caused many financial problems in some households (Pennar et al., 1996; Lohr, 1996).

Although the increase in employment instability is an issue in households' financial matters, there has been little attempt to examine whether and how employment related factors affected households' financial behavior. In savings literature, some of the studies have examined households' precautionary motive of saving with theoretical approaches, whereas some empirical studies have focused on figuring out the adequacy of emergency funds and related factors. Yet empirical research that has extensively examined the effect of employment related factors on households' savings for security purposes has been sparse. In addition, households' financial security is susceptible to macroeconomic changes as well as to events within the households (Johnson &

Widdows, 1985) such as divorce, health status, and unemployment (Haley & Rejda, 2001; Sullivan, Warren, & Westbrook, 2000). Among the events that influence financial security of households, employment related factors are particularly responsive to macroeconomic changes. However, no study has taken into account macroeconomic impacts from different economic periods to examine this kind of topic.

To address the limitations of previous studies, this study was undertaken to provide a better understanding of the relationship between employment stability and households' savings. Focusing on employment instability as an essential factor of an unexpected income shock (Dominitz & Manski, 1996), the purposes of this study were 1) to profile working households' employment characteristics as well as financial needs, resources, preferences and perceived and objective financial security; 2) to investigate the effect of employment related factors on households' security funds; 3) to identify factors that affect savings for security purposes; and, 4) to compare the results from two periods, a period of recession and a period of prosperity, to account for macroeconomic impacts.

A detailed investigation into employment characteristics as well as other factors known to influence savings will expand the knowledge of households' saving when encountering unexpected events. Also, the results of this study will provide useful information for policy makers when establishing policies related to employment and saving. In addition, the findings will be helpful in identifying which consumers are at high risk during times of economic downturn. Such information can be used to design financial

educational programs to assist consumers. Furthermore, the findings will be useful in understanding financial behaviors of Korean households that have recently undergone rapid increases in employment instability. This study can guide a direction to approach Korean households' saving behavior for precautionary purposes related to employment.

II. Review of Literature

1. Theoretical Background

According to the theory of risk management, self-insurance or accumulating one's own savings, has been the most common way to deal with risk against unforeseen income fluctuations (Vaughan, 1997). Family stress theory provided the basic framework for this study. The theory suggests how stressors (employment instability) and family resources, financial needs, and psychological factors (attitudes and expectations) are related to the perception of the crisis (financial insecurity), and how those factors affect the family adjustment (i.e., changes in wealth). Having established this basic framework, the precautionary saving theory provided a main theoretical background.

Precautionary saving emphasizes two functions of saving. It spreads resources over the life-cycle and insures against uncertain events like unexpected income risk (Lusardi, 2000). The essence of this theory is the combination of uncertainty and convex marginal utility. Except for the assumption of certainty equivalence, the precautionary motive for saving is consistent with

the basic theory of intertemporal allocation (Deaton, 1992). Under the certainty equivalence model, it is assumed that consumers want to maintain constant marginal utility over time because the marginal propensities to consume out of current and future expected income are the same. Also, the model implies that lifetime consumption is independent of the expected path of income, and expected changes in income have no effect on consumption (Browning & Lusardi, 1996). However, under uncertainty, the precautionary saving model suggests that the marginal utility of consumption function is convex, so an increase in uncertainty raises the value of future consumption. Thus, consumers will reduce current consumption and will increase savings for future consumption (Deaton, 1992).

Under the certainty equivalence model, Zeldes (1989) derived the optimal consumption level for each case of the uncertain random labor income. Figure 1 illustrates optimal consumption with the different degrees of income risk and without income risk from Zeldes's work. With this figure, the precautionary saving theory can be explained. CCEQ represents the consumption function under the certainty equivalent model. Under certainty, the consumption function would be an upward sloping straight line as the level of wealth increases (Zeldes, 1989). The two curves represent the consumption function under uncertain future income. If less change in future income is expected, the consumption function will be the dotted curve. The precautionary saving is the difference between consumption when income is certain and when income is uncertain (Leland, 1968). In order to compare the extent of

precautionary saving for the two cases of income variations (i.e., high and low variations in income), two arrows which represent the precautionary saving are added to Zeldes's "Optimal Consumption Figure" (p. 287). Following Leland' s definition of precautionary saving, the arrow "a" represents the amount of precautionary saving for the case in which less change in income stream is expected (lower income risk), and the arrow "b" represents the amount of precautionary saving for the case in which more change in income stream is expected (higher income risk). Hence, according to Figure 1, the amount of precautionary saving is greater for more risky income streams than for a less risky income stream. That is, if a household expect more risky income streams in the future, it should accumulate more precautionary saving.

According to Deaton (1992), the precautionary saving motive is strengthened when liquidity constraints exist. Without access to external insurance in the case of unexpected income shock, households must provide it for themselves by accumulating additional assets. But, under the same circumstances, the ability to borrow in difficult times acts as an insurance vehicle for some households. In addition to that, if there are borrowing restrictions, the expected marginal utility of future consumption is further increased, which induces the precautionary saving motive.

2. Household Saving for Precautionary Purpose

Savings as insurance to protect against future unforeseen events has been recognized by economists for many years. Until recently, however, the precautionary motive of saving has played a relatively minor role in the savings
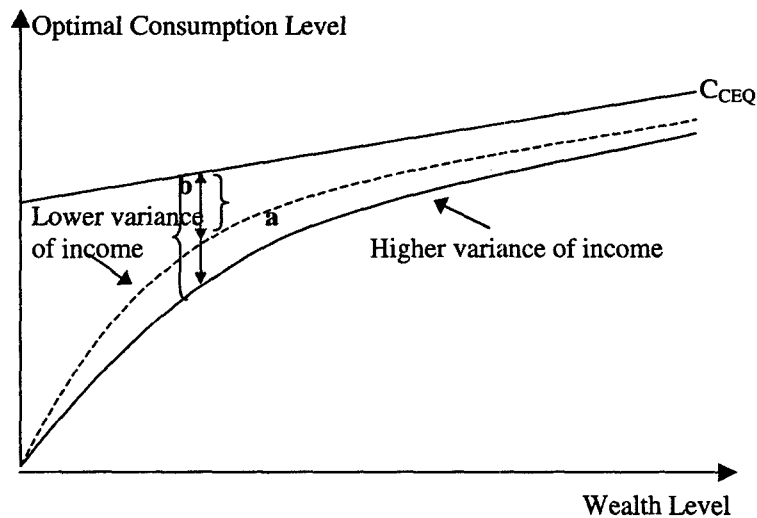
<Figure 1> Optimal Consumption with Different Income Risk. From "Optimal Consumption with Stochastic Income: Deviations from Certainty Equivalence," by S. P. Zeldes, 1989, The Quarterly Journal of Economics, 104 (2), p. 287. Copyright 1989 The MIT Press

literature. There have been two approaches in studying household saving against an unexpected income shock. First, the precautionary motive of saving has been examined. With the precautionary saving model, uncertainty has been incorporated into the savings model that allows for saving not only to allocate resources over the lifetime but also to insure against an unexpected income shock in the future (Lusardi, 2000). Researchers have attempted to identify the extent of the precautionary motive in saving (Carroll & Samwick, 1998; Deaton, 1991; Kimball, 1990; Zeldes, 1989) and to investigate the relationship between future income uncertainty and the accumulation of precautionary savings (Caballero, 1991; Guiso, Jappelli, & Telizzese, 1992; Lusardi, 1997, 2000; Skinner, 1988). Theoretical literature on the precautionary saving motive has documented that future income risk boosts households' savings (Carroll & Samwick, 1998; Kimball, 1990; Zeldes, 1989).

However, the empirical work on precautionary saving is in its initial stages and has produced some mixed results (Kazarosian, 1997; Lusardi, 1997). Finding an appropriate measure for income uncertainty in empirical studies has been a problem. Recently, Engen and Gruber (1998) suggested that among unforeseen events, unemployment risk is the key element of the risk that affects financial security for working households. In line with this view, recent studies (Carroll, Dynan, & Krane, 1999; Lusardi, 2000) have turned their attention to the employment related risk such as unemployment risk or probability of job loss rather than income variability in general. Carroll et al. suggested that

unemployment risk could provide a much clearer signal of the uncertainty faced by a household than variations in income throughout one's life. Thus, Carroll et al. concluded that unemployment risk is a better measure than income variability when studying households' precautionary saving.

Most previous studies on precautionary saving have focused on overall income uncertainty throughout an individual's lifetime rather than examining an unexpected income interruption. However, households are vulnerable to unexpected financial crises (Johnson & Widdows, 1985). Moreover, managing an income interruption caused by unexpected events is more critical than dealing with overall income uncertainty. Thus, it is important to understand the causes of unexpected income interruptions and the relationship between the causes and households' behaviors. Previous studies on the precautionary savings have not provided such an understanding. Also, previous studies were either primarily theoretical or, they did not provide solid results of savings for precautionary purpose. In fact, many of them overlooked some important factors that might account for households' saving behavior.

Second, the adequacy of emergency funds of households has been studied. Using different measures of assessing emergency funds, studies have examined factors related to the adequacy of emergency funds (Chang, Hanna, & Fan, 1997; Ding & DeVaney, 2000; Huston & Chang, 1997; Johnson & Widdow, 1985). The focus of previous studies was on measuring the adequacy of emergency funds and identifying households which are most likely to be financially unprepared for emergencies. However, the previous studies did

not examine the effect of one of the important factors that causes financial emergency to households. According to Garman and Forgue (1997), employment related factors are important, as is the family situation, in determining the appropriate amount of emergency funds. Also, previous studies (Chen & DeVaney, 2001; Huston & Chang, 1997) suggested the need for inclusion of income instability or work history in future studies to reflect employment effect on emergency funds. Yet no study has investigated the effects of employment related factors on savings for emergency.

In addtion, the existing literature on emergency funds has questioned why so many households do not hold adequate amounts of emergency funds and whether such behavior is rational (Chang et al., 1997; Hatcher, 2000). Subsequently, studies have suggested that the whole concept of emergency funds be reevaluated to consider any other available resources that will meet unexpected events when households encounter any risk (Huston & Chang, 1997).

The previous literature on households' saving for precautionary purposes has shown that employment conditions were important and could be used as a measure of employment stability. Also, although there were few empirical findings regarding the study of precautionary savings, the research on emergency funds has continuously found that households' financial needs and resources reflected by socio-economic characteristics are significant factors in determining savings for precautionary purposes. In addition, some of the previous studies have found that preferences of households play an important

role in predicting savings for precautionary purposes. Finally, family stress theory has suggested that the level of saving (the level of households' adjustment) depends on perceived and objective financial insecurity factors, which were not considered in the previous literature.

Based on the theories and previous studies, the conceptual framework of this study can be specified as follows,

$$S_h = f[E, (N, R, P), I] \qquad (4)$$

Where, S_h: Security funds of the household; E: Head of households' employment conditions; stressors or risk; N: Financial needs that included the age of the household head, marital status, and the number of children; R: Resources to meet the demands of the situation created by the event which includ human resources (e.g., the years of education), financial resources (e.g., income, homeownership), and credit related resources (e.g., credit limit); P: Preferences of households such as attitudes or expectations; I: Financial insecurity; crisis that included both the perceived financial security and objective financial security, and f: functional form.

3. Hypotheses

The theoretical background and previous research are used to formulate the following hypotheses.

H1 Households will have less security funds, if the household head is in a more stable employment condition.

H2 Households will have more security funds, if financial needs are fewer.

H3a Households will have more security

funds, if they have more human and financial resources.

H3b Households will have more security funds, if they have fewer credit related resources.

H4 Households' preferences will be significantly related to the amount of security funds.

H5 Financial security of households will be significantly related to the amount of security funds.

H6 Households headed by an individual who is white will have more security funds than those headed by an individual who is non-white.

H7 The effect of employment conditions on the amount of security funds will differ between 1992 and 1998 due to the different economic conditions between the two periods.

III. Methodology

1. Data and Sample

This study uses data from the 1992 and 1998 Survey of Consumer Finances (SCF). The SCF is a nationally representative data set that is collected every three years. The survey is well-known for its detailed information of asset and debt holdings of U.S. households; it also has more information on attitudes and expectations when compared to other economic data sets. Thus, the SCF is appropriate for the purpose of this study. The 1992 and 1998 SCFs were chosen because the 1992 data were

collected right after a recession, and the 1998 data were collected during a period of economic prosperity. By analyzing data from different economic situations, this study can investigate any macroeconomic impacts that are extended to households.

The sample for this study includes only working households in the 1992 and 1998 SCFs. Because the focus of the study is employment conditions and the corresponding labor income risk, the model of this study is useful for understanding the behavior of the working population. The final sample includes 2,945 and 3,225 households from the 1992 and 1998 SCF respectively.

2. Variables and Measurement

Dependent variables. Unlike previous work on this topic that has examined liquid assets or net worth, this study attempted to construct a measure of security funds. Some households keep their money in liquid assets for check writing or cash to meet daily living expenditures. Therefore, liquid assets for daily expenditures should not be included as an asset to provide for households' financial security in the future. Some assets such as real estate cannot be used to fulfill households' security needs immediately when unexpected events happen. Hence, examining net worth is also not an appropriate way to investigate this topic.

To develop a measure of security funds, Xiao and Anderson's approach was used. According to Xiao and Anderson (1997), financial assets can be divided into three categories: assets for survival needs, assets for security needs, and assets for growth needs. Following Xiao and Anderson's

approach, the percentage of each of 13 asset[1] shares in total financial assets was calculated and plotted using the each asset share on the Y-axis and the levels of financial asset on the X-axis. And then, based on the pattern of the charts, if the pattern showed an inverse J shape ($\mathord{l}$) or a J shape ($\mathord{J}$), then the asset was considered to be an asset for survival needs or an asset for growth needs, respectively. If the pattern of the chart was neither a J shape nor an inverse J shape, the asset was considered to be an asset for security needs. According to the patterns of the charts, security funds were the sum of money market accounts, CDs, retirement accounts, savings bonds, cash-value life insurance, and other financial assets. For the analyses, the amount of security funds was transformed using a natural logarithm. Taking the natural log can lessen the heteroskedasticity of variables and make estimates less sensitive to outlying observations (Wooldridge, 2000).

Independent variable. The independent variables consist of six sets of factors based on the theoretical framework and previous research. In this study, the stress or risk is conceptualized as employment instability, which was measured by a proxy set of employment related variables. There was no single consensus on how to measure uncertainty or risk. A recent study (Carroll et al., 1999) has suggested that the probability of job-loss should provide a more obvious signal of the uncertainty faced by a household than variation in income throughout the lifetime. On the other hand, Lusardi (2000) has suggested that using subjective probabilities of job loss would be the better measure for uncertainty to avoid problems from constructing a measure of uncertainty. However,

following Focardi and Jonas (1998), this study used several proxies to measure employment instability that represented uncertainty in income. According to Focardi & Jonas (1998), it is difficult to measure risk or uncertainty with a single measure because the concept of risk or uncertainty has multiple dimensions. In fact, there were some empirical studies that used several employment related variables as a measure of employment stability (e.g., Daly & Duncan, 1997; Marcotte, 1994; Skinner, 1989). Therefore, following the previous studies, employment stability was measured using five proxies that could represent the uncertainty in income. The five proxies included number of years of working for the same employer (job tenure), occupation, full-time or part-time job, self-employment, and past unemployment experiences. However, since the past unemployment experiences variable was not available in the 1992 SCF, only four proxy variables were used in the multivariate analysis that used the pooled data.

The previous studies on employment stability has suggested that sustaining a longer job tenure, having a white collar job, having a full-time job, being a non self-employed worker, and not having past unemployment experiences were the signs of

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1) The 13 assets are checking accounts, savings accounts, money market accounts, call accounts at brokerages, certificates of deposit, total directly-held mutual funds excluding money market mutual funds, stocks, bonds, sum of IRAs and thrift accounts, savings bonds, cash-value of whole life insurance, other managed assets including annuities and trusts, and managed investment accounts, and other financial assets including non-public stocks, royalties, gold, cash, and other miscellaneous assets.

stable employment. In terms of self-employment, the self-employed were considered as being in unstable employment conditions since the income fluctuation of the self-employed was higher than those who were not self-employed.

To reflect the individual differences in financial needs-age, marital status, and the number of children were included. Education, health status, being dual earners or not, household income, net worth, home ownership, credit limit, and credit constraint were included as variables representing households' resources. To capture households' preferences, attitude toward credit, attitude toward risk, expectation about future income, and savings motive were included. Financial security measures included both perceived financial security and financial difficulty. Perceived financial security was measured if a household had confidence about its future income that provided feelings of security regarding its financial status. Financial difficulties that caused financial insecurity in the households were measured using two questions: the first asked if households' spending was greater than their income; the second asked if income was unusually low compared to a normal year. Race was included as another characteristic of households. See <Table 1> for detailed measurement of the variables.

3. Model Specification and Estimation Method

The empirical model for security funds was drawn as follows.

$$Y_i = x_i \beta_i + \varepsilon_i \qquad (3.1)$$

Where, Y_i is the amount of security funds for an

individual household *i*. ε_i represents error term in the equation. x_i is a vector of explanatory factors of households *i*, and β_i is a vector of coefficients corresponding to each of the explanatory factors.

The dependent variable, the amount of security funds, was measured as a continuous variable and the proportion of zeroes in the dependent variable was not large. Thus, ordinary least squares (OLS) regression analysis was an appropriate method for estimating the βs. However, the pooled data in this study were the time series data that combined the two time periods. Often when time series data are used, the error terms are autocorrelated through time. In such cases, Autoregressive Error Model (AR Model) with a maximum likelihood estimation method can be used to obtain valid parameters (Wooldridge, 2000).

The model with autocorrelation is as follows.

$$Y_t = x_t \beta_i + u_t, \quad u_t = \rho \, u_{t-1} + v_t \qquad (3.2)$$

Where, ρ is coefficient of autocorrelation, and $-1 < \rho < 1$. The error term (u_t) has systematic component ρu_{t-1} and random error v_t, implying that $E[u_t] = 0$, and $var[u_t] = \sigma_u^2 = \sigma_v^2 / 1 - \rho^2$ (Wooldridge, 2000). If the error terms are autocorrelated, the efficiency of OLS coefficients is adversely affected and standard errors are biased. The AR Model generates efficient OLS estimators and unbiased standard errors for time series data when the errors are autocorrelated. Using the maximum likelihood method, the log likelihood function for the AR Model is maximized by minimizing an equivalent sum-of squares function (SAS Onlinedoc, n.d.; Wooldridge, 2000).

<Table 1> Measurement Variables

Variables	Measurement
Dependent Variable	
Security Funds	The sum of money market accounts, CDs, retirement accounts, savings bonds, cash-value life insurance, and other financial assets
Independent Variable	
Employment Characteristics	
Job tenure	Continuous
Occupation	
Managerial/professional	1 if managerial or professional, 0 if otherwise
Technical/sales	1 if technical or sales, 0 if otherwise
Blue-collar	1 if operators, laborers, farming, or fishing, 0 if otherwise
Full-time job	1 if full-time, 0 if otherwise
Self-employed	1 if self-employed, 0 if otherwise
Past unemployment	1 if unemployed in the past 12 months, 0 if otherwise.
Financial needs	
Age	Continuous
Marital status	
Married	1 if married, 0 if otherwise
Single	1 if never married, 0 if otherwise
Divorced/separated/widowed	1 if divorced/separated/widowed, 0 if otherwise
Number of children	Continuous
Resources	
Education	
Less than high school (<12)	1 if yes, 0 if otherwise
High school (=12)	1 if yes, 0 if otherwise
Some college (13-15)	1 if yes, 0 if otherwise
College degree or higher (16+)	1 if yes, 0 if otherwise
Health status	
Excellent	1 if yes, 0 if otherwise
Good	1 if yes, 0 if otherwise
Fair or poor	1 if yes, 0 if otherwise
Dual earners	1 if yes, 0 if otherwise
Income (log)	Continuous
Net worth (log)	Continuous
Home ownership	1 if owner, 0 if otherwise
Credit limit (log)	Continuous
Experience of credit constraint	1 if turned down for credit in the past, 0 if otherwise

Note. [1]Pr is the abbreviation of probability

<Table 1> continued

Variables	Measurement
Preferences	
Specific attitude towards credit	
Using credit when income is cut	1 if all right, 0 if otherwise
Attitude towards risk	
Above average risk	1 if take risk above average, 0 if otherwise
Average risk	1 if take average risk, 0 if otherwise
No risk	1 if take no risk, 0 if otherwise
Expectation for future income	
Up	1 if more than the price, 0 if otherwise
Less	1 if less than the price, 0 if otherwise
Same	1 if same as the price, 0 if otherwise
Savings motive	1 if have a savings motive for emergency, security or future, 0 if otherwise
Financial Insecurity	
Perceived financial security	1 if has a good idea about their future income, 0 if otherwise
Experience of financial difficulties	1 if spending exceeded income or income was unusually low compared to normal year, 0 if otherwise
Other characteristics of Household	
Race	1 if white, 0 if otherwise
Year dummy & Interactions	
Year1998	1 if year is 1998, 0 if otherwise
Year 98 * Job tenure	Interaction term between year 98 and job tenure
Year 98 * occupation	Interaction term between year 98 and occupation
Year 98 * full-time workers	Interaction term between year 98 and full-time work
Year 98 * self-employed	Interaction term between year 98 and self-employment
Year 98 * past unemployment	Interaction term between year 98 and past unemployment

4. Estimation Procedure

Descriptive statistics provided information about the sample for the 1992, 1998, and pooled data. Before conducting a multivariate analysis, the potential multicollinearity problem was checked and the Durbin-Watson test was conducted to examine any potential presence of autocorrelation in the error terms. In order to examine the effect of employment related factors on the amount of security funds and other factors affecting security funds, the AR Model with a maximum likelihood estimation method was used to take into account autocorrelation in the error terms. To investigate the changes in effects of employment variables between the two periods, the pooled model including interaction terms between year dummy and employment variables was examined. Before pooling the data, all dollar amounts in the 1992 data were adjusted to 1998 dollars using the Consumer Price Index to reflect a real amount rather than a nominal amount.

IV. Results

1. Sample Characteristics

Descriptive statistics show the characteristics of the households in each of 1992, 1998, and pooled data. <Table 2> presents the sample characteristics. The descriptive statistics on employment conditions indicate that there was a slight difference in employment conditions for the 1992 and 1998 samples. In 1992, on average, an individual had worked for 8 years and 7 months for the same employer. Thirty-one percent had a managerial or professional job. Eighty-four percent were working full-time. Fifteen percent were self-employed. In 1998, the average length of job tenure was 8 and a half years. Twelve percent of the households were headed by a part-time worker. Fourteen percent (14.33%) reported that they had been unemployed during the past 12 months.

The sample characteristics about financial needs, resources, preferences, and financial security showed similar characteristics between the samples from the two periods. On average, the age of the household head was 42 years old. Households had one child on average. About one third of the sample had a college education or more. Approximately, 45% had a positive attitude toward borrowing when income was cut. Thirty percent of the households expected their income to go up. Some of the characteristics showed a little difference between the samples. In 1998, the proportion of non-married households increased. Households in the 1998 data had a slightly higher level of financial resources, and the higher proportion of households would be willing to take

a financial risk in 1998. The perception of financial security was better in 1998 than in 1992, while the proportion of households who went through financial difficulty was less in 1998 than in1992.

2. Results of MLE for Pooled Data

Since the pooled data combined data from different time periods, the Durbin-Watson test was performed to diagnose autocorrelation in the error terms. The results of the Durbin-Watson test indicated that negative autocorrelation was present at the 0.05 significance levels (Neter, Wasserman, & Kutner, 1985). Therefore, the Autoregressive error (AR) model using a maximum likelihood estimation was used instead of the OLS regression to correct for the autocorrelation. The pooled data from the 1992 and 1998 SCFs contained 6,167 working households. To take into account any macroeconomic effects on employment conditions between 1992 and 1998, the interaction terms between employment conditions and year dummy were included. The results are presented in <Table 3>.

The results showed that two employment related variables were significantly related to the amount of security funds. Households which had a shorter job tenure and those with a blue-collar job had less security funds compared to those which had a longer job tenure and those which had a technical or sales job. The variables representing resources had significant effects on the amount of security funds. Human resources such as education, health status, and being a dual earner household were positively related to the amount of security funds. Financial resources including income, net worth, and credit limit also had positive influences on the

<Table 2> Sample Characteristics (Weighted Descriptive Statistics for the 1992, 1998 & pooled SCF)

Variables	1992 SCF Mean (SD) / %	1998 SCF Mean (SD) / %	Pooled Sample Mean (SD) / %
Employment Conditions			
Job tenure	8.51(9.23)	8.61(9.19)	8.56(9.22)
Occupation			
Managerial/professional	30.81%	33.05%	31.97%
Technical/sales	24.14%	19.08%	21.51%
Blue-collar	35.38%	42.91%	38.29%
Full-time worker	83.99%	87.98%	86.07%
Self-employed	15.02%	14.12%	14.64%
Past unemployment	--	14.33%	--
Financial Needs			
Age	41.63(12.32)	41.73(11.95)	41.68(12.13)
Marital status			
Married	63.89%	19.76%	16.35%
Divorced/separated/widowed	56.16%	22.87%	20.97%
Single	59.87%	21.38%	18.75%
Number of children	0.89(1.16)	0.88(1.15)	0.88(1.16)
Resources			
Education			
Less than high school	12.81%	13.95%	13.40%
High school	30.28%	28.16%	29.18%
Some college	23.07%	25.89%	24.53%
College degree or higher	33.85%	32.00%	32.89%
Health Status			
Excellent	42.61%	33.36%	37.80%
Good	43.64%	51.68%	47.82%
Fair or poor	13.74%	14.97%	14.38%
Dual earner	38.30%	40.03%	39.20%
Income($)	54,405.27(105,995)	60,019.74(254,548)	57,325.67(197,743)
Net worth($)	230,549.69(1,486,458)	269,770.3(1,876,160)	250,950.50(1,700,460)
Homeowner	60.31%	61.91%	61.14%
Credit limit($)	6,614.39(11,956)	12,585.56(22,488)	9,720.33(18,454)
Experience of credit constraint	26.99%	27.46%	27.24%
Preferences			
Specific attitude towards credit			
Positive	44.96%	44.92%	44.93%

<Table 2> continued

Variables	Definition and measurement		
Attitude towards risk			
Above average risk	17.22%	27.92%	22.79%
Average risk	40.77%	41.17%	40.98%
No risk	42.00%	30.91%	36.23%
Income expectation			
Up	30.83%	29.22%	29.99%
Same	42.50%	46.71%	44.69%
Less	26.67%	24.07%	25.32%
Savings motive	29.43%	25.02%	27.13%
Financial Security			
Perceived financial security	64.96%	68.66%	66.89%
Financial difficulty	36.09%	30.78%	33.33%
White	74.73%	76.49%	75.64%

Note. All dollar values are in 1998 dollars.
Dashes indicate the variable was not included.

<Table 3> Results of MLE on Security Funds Model (Pooled Data)

Variables	Pooled data (n=6,167)		
	Estimate	Standard Error	p-value
Employment Condition			
Job Tenure	0.03	0.01	0.000 ***
Occupation (Technical / sales)[1]			
Managerial/professional	0.16	0.15	0.306
Blue-collar	-0.60	0.17	0.000 ***
Full-time worker	-0.31	0.18	0.078
Self-employed	-0.08	0.14	0.580
Financial Needs			
Age	0.00	0.00	0.569
Marital status (Single)			
Married	0.09	0.15	0.559
Divorced/separated/widowed	0.14	0.15	0.349
Number of children	-0.04	0.04	0.334
Resources			
Education (Less than high school)			
High school	0.42	0.15	0.005 **
Some college	0.84	0.16	0.000 ***
College degree or higher	1.10	0.16	0.000 ***

<Table 3> continued

Variables	Pooled data (n=6,167)		
	Estimate	Standard Error	p-value
Health status (Fair or poor)			
Excellent	0.30	0.14	0.034 *
Good	0.22	0.14	0.108
Dual earner	0.34	0.10	0.000 ***
Income (log)	0.36	0.03	0.000 ***
Net worth (log)	0.42	0.02	0.000 ***
Homeownership	0.22	0.11	0.050
Credit limit (log)	0.17	0.01	0.000 ***
Experience of credit constraint	-0.12	0.10	0.250
Preferences			
Attitude towards credit (Negative)			
Positive	-0.14	0.08	0.091
Attitude towards risk (Average risk)			
Above average risk	0.16	0.10	0.109
No risk	-0.68	0.11	0.000 ***
Income expectation (Same)			
Up	-0.08	0.10	0.414
Less	-0.17	0.11	0.119
Less	-0.17	0.11	0.119
Savings motive	-0.01	0.09	0.953
Financial security			
Perceived financial security	0.39	0.09	0.000 ***
Financial difficulty	-0.12	0.10	0.208
Other characteristics of Household			
Race (Non-white)			
White	0.47	0.11	0.000 ***
Year 1998	-0.11	0.25	0.651
Year 98 * Job tenure	-0.01	0.01	0.370
Year 98 * Managerial/professional	-0.09	0.21	0.674
Year 98 * Blue-collar	0.02	0.22	0.948
Year 98 * Full-time workers	0.60	0.25	0.018 *
Year 98 * Self-employed	-0.40	0.19	0.035 *
Intercept	-3.31	0.39	0.000 ***
Rho	-0.02	0.01	0.062
Log-Likelihood		-15882.572	

Note. [1]Reference groups are in parentheses.

* $p < .05$ ** $p < .01$ *** $p < .001$.

amount of security funds. Among the variables measuring preferences or financial security, attitude towards risk and perceived financial security were significantly related to the amount of security funds. In addition, attitude towards risk significantly influenced the amount of security funds. Households who would not take any financial risk when investing and saving had a smaller amount of security funds. This suggests that households which do not want to take any risk in investing and saving probably hold their money in the safest but least profitable savings options, resulting in a lowering of the total amount of security funds. Thus, taking some financial risk would be associated with an increase in the amount of security funds. Households which perceived that they were financially secure had a larger amount of security funds compared to those which did not perceive that they were financially secure. Households headed by an individual who was white had more security funds than those headed by an individual who was non-white.

Wooldridge (2000) provided guidance to the interpretations of year dummy and interaction terms. The year dummy variable was not significant, indicating that after controlling for other variables, the amount of security funds had not significantly changed between 1992 and 1998. However, it seemed that there were some macroeconomic impacts on employment conditions between the two periods. Although there was no significant change in the effect of job tenure and occupation between the two periods, two interaction terms were significant. The interaction effect between full-time and year dummy showed that full-time workers had more

security funds than part-time workers in 1998. In 1992, there was no significant difference in the amount of security funds between full-time and part-time workers. The interaction effect between self-employment and year dummy indicated that the difference between the self-employed and the non self-employed increased from 1992 to 1998. That is, the self-employed had slightly less security funds in 1992 compared to the non self-employed. However, in 1998, the self-employed had considerably less security funds than the non self-employed.

In summary, the results for pooled data suggested that resource factors played the most significant role in determining the amount of security funds. Except for credit constraint and homeownership, all variables representing resources were significant and consistent with the hypotheses. However, the result for credit limit was contrary to the expectation. Employment related factors were also important. Job tenure and occupation were significant, and the results were consistent with the hypotheses. The results regarding attitude towards risk and race supported the hypotheses, but the results regarding perceived financial security were contrary to the hypothesis. The effects of two employment conditions differed between 1992 and 1998.

V. Discussions and Implications

Recognizing the concerns regarding an economic downturn and the changing employment stability, this study investigated whether and how employment related factors influenced household

saving for precautionary purposes while controlling for financial security factors. This study used theories from economics and sociology to link households' economic behaviors and social phenomena such as changing employment stability. Also, it developed a measure of security funds to study household savings only for security purposes. This measure suggests a new method of measuring savings for precautionary purposes. An empirical model was developed based on the precautionary saving theory, family stress theory, and previous studies.

The results of the MLE on security funds suggested that factors representing resources were significant. In addition, some of the employment related factors, preferences, financial security, and race were significantly affected the amount of security funds. According to the results, stable employment conditions were important for households when accumulating security funds. As hypothesized, households with more human resources and financial resources had a larger amount of security funds than those which had less human and financial resources. According to the precautionary saving theory, the precautionary motive of saving is strengthened with the existence of liquidity constraint (Deaton, 1992). Although 29% of each sample was credit constrained, the credit constraint did not affect the amount of households' security funds. The credit limit could be considered as an alternative resource to the households, and it was expected to have a negative relationship with the amount of security funds. However, the credit limit was positively related to the amount of security funds. Therefore, it appears that the higher credit limit in this study reflects a

stable financial status for working households suggesting that households which had a higher credit limit had more security funds. The results from the interaction terms suggested that although there was no significant difference in the amount of security funds between 1992 and 1998, two of the employment related variables showed different effects between the two periods.

From the findings, implications for research, policy makers, and financial educators are suggested. First, the results are worth discussing to provide implications for research. Recently, the precautionary saving theory has been emphasized in the saving literature (Carroll, 1991; Deaton, 1992; Lusardi, 2000). Although the precautionary saving theory provides insight into saving behavior beyond the life cycle and permanent income hypotheses, the empirical examination of the theory is in an experimental stage. This study is one of the few empirical examinations based on the theory. However, the results did not fully support the precautionary saving theory. Instead, many of the results were consistent with empirical studies that suggest disagreement with the theory (e.g., Lusardi, 2000; Skinner, 1989). This result might stem from the lack of self-control or prudence of individuals. The precautionary saving theory assumes that if an individual has a higher degree of uncertainty, he or she will save more (Leland, 1968). However, even though an individual has a higher degree of uncertainty and a higher precautionary saving motive, if the individual has little self-control or is not very prudent, then he or she is more likely to consume rather than to save for the future. Therefore, the precautionary saving theory could be strengthened

by incorporating the concept of self-control introduced in behavioral life cycle theory (Shefrin & Thaler, 1988) or by including the concept of prudence.

Second, the findings indicated that households appeared to have enough security funds relative to their income. However, during the economic downturn, the ratio of the security funds to income declined to half of the amount compared to the period of economic prosperity. Moreover, households in less stable employment conditions had less security funds even after controlling for the financial security factor. According to the precautionary saving theory, they should have had a higher level of security funds because they faced a higher degree of uncertainty. But, it appeared that relatively less stable employment conditions prevented households from accumulating security funds. Therefore, policy makers should pay particular attention to individuals in less stable employment conditions. Most of them are not currently included in the official unemployment rate, but their numbers should not be neglected. A policy to protect individuals against job loss in less stable employment condition would be important as much as important a policy to create new jobs for the unemployed.

Third, the most financially vulnerable groups during economic downturn are those who are in less stable employment conditions, those who have dependent families, those whose spouse has no labor force attachment, and those who have no security funds. Therefore, the importance of accumulating some security funds as self-insurance against unforeseen events should be emphasized in financial education programs. In particular, the

results suggested that households which need more security funds had less security funds. Financial educators should encourage these households to establish and maintain security funds in case of economic downturn.

Finally, this study focused on employment and the corresponding labor income risk. Other kinds of risks or uncertainties such as death, disability, or medical expenses were not addressed. Future studies may include the other kinds of risks and examine how the added risks influence the amount of open-ended credit. The failure to support the precautionary saving theory in this study might reflect the difficulty of measuring uncertainty. Using a secondary data source, finding an appropriate measure of uncertainty is a challenge for researchers. An attempt to find a good measure should continue in the future. Lastly, it would be interesting if future research would compare the results between U.S. households and Korean households to examine how households in these two countries respond differently when encountering employment instability.

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