

Using predicted perceived emergency fund adequacy to segment prospective financial consulting clients

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Abstract

This research examines determinants of emergency fund adequacy using a classification tree methodology. A subjective evaluation of emergency fund adequacy was obtained from a survey with 404 respondents in two United States cities. The sample data showed financial behaviors, such as whether a respondent saves regularly, pays credit card bills in full each month, and has a written financial plan, and demographic characteristics such as household size and ethnicity, were major splitters of the classification tree. The findings suggest that a series of questions can be used when working with prospective clients to separate target profile clients from others in practice. © 2006 Academy of Financial Services. All rights reserved.

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1. Introduction

Financial consultants, be they planners or counselors, face a difficult task when first meeting a prospective client. The consultant must determine if a prospect fits within the advisor's target market (Bruckenstein & Drucker, 2004). The difficulty arises in that the decision must often be made quickly. It is during the first crucial minutes of a meeting with a prospective client that a planner must develop a client profile. How should a financial consultant undertake the evaluation? One way is to begin the process by filling out a detailed client questionnaire. This approach is problematic. First, nearly all prospective clients will be put off by the prospect of sharing detailed personal information with someone they have just

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met, even if the person is highly recommended through a referral. Second, few clients come to the first client or planner meeting with sufficient documentation to accurately complete a client data gathering questionnaire. Answering questions without sufficient information will undoubtedly lead to wrong answers based on conjectures and pure guesses.

In lieu of completing a client questionnaire some financial consultants base the decision to work with a client on their intuition. Factors such as the prospect's age, gender, and physical appearance all combine to create an image of someone that may fit the consultant's target market. Again, this approach to selecting clients can lead to significant errors. As the ownership of wealth becomes more diverse in the United States it is becoming increasingly difficult to segment prospects solely on their outward appearances and social situation.

Therefore, if demographic profiling and intuition lead to problematic outcomes is there a better way to screen prospective clients that can be accomplished relatively quickly and effectively? The purpose of this paper is to offer potential guidelines in answer to this question. The research presented here uses a classification tree to examine the predictors of those who do and those who do not meet the three-month emergency fund rule. The emergency fund rule is hypothesized to be a proxy of financial capacity, which defined as the ability to withstand a financial shock. Financial consultants are particularly interested in a prospective client's financial capacity because without an adequate level of financial wherewithal, an exogenous event can alter the way client assets are managed (Roszkowski, Davey & Grable, 2005). It is anticipated in this paper that no more than a handful of questions can be used by a financial consultant to efficiently separate prospects into a target client group and others into suboptimal groups. If it is possible to screen prospective clients using a series of simple to answer questions that do not probe too deeply into a client's personal and financial life, answers to these questions can give a financial consultant a quick and effective mechanism for deciding if he or she should continue to work with the prospective client.

This research examines who is more likely to meet three-month emergency fund adequacy by using a classification tree and a subjective measure of emergency fund adequacy. The findings from this research have several implications for financial professionals, researchers, and policy makers. First, the classification tree methodology gives an easy to understand outcome to financial consultants. Using classification tree findings, financial consultants can segment their clients into profile groups. By segmenting clients, professionals can develop targeted strategies designed to improve their clients' financial wellness. Second, through the use of classification tree analyses in personal finance research, researchers can examine more complicated data without restrictions on variable distribution. Third, policy makers will appreciate the classification tree methodology because of its prescriptive categorization ability, which can lead to ways to improve family well-being.

2. Review of literature

What determines a person's level of financial capacity (i.e., the ability of a person or family to withstand a financial shock)? This is not an easy question to answer. Personal financial capacity is related to financial wellness and proper financial planning. In the late

1990s, Chieffe and Rakes (1999) proposed an integrated financial planning model that incorporates management and preparedness for planned and unplanned financial events. Specifically, Chieffe and Rakes included management of current personal finances, emergency planning for unexpected events, investing for various financial goals, and transferring wealth for a long time horizon into their financial model. For financial wellness, individuals and families should exhibit appropriate financial practices of budgeting, tax planning, investment planning, retirement planning, insurance planning, and estate planning. Key to the model was the need for families to engage in financial emergency planning preparation.

Being prepared for a financial emergency (a component of personal financial wellness) is a vital concern for many Americans, especially after the incidents of September 11, 2001 and the ongoing war on terrorism. Financial markets are hard to predict and in an emergency situation people often find they need to wait a long period of time to get a new job. According to statistics from the U.S. Department of Labor (2004), the average unemployment duration between August 2003 and August 2004 ranged from 17.5 weeks to 20.0 weeks with a median of 8.0 weeks to 10.8 weeks. The statistics showed that the duration of unemployment rose almost 60% from January 2001 (average duration in 2001 was 12 weeks). Using Survey of Consumer Finances data, researchers have found that the majority of Americans are not adequately prepared for an emergency (Bi & Montalto, 2004; Chang & Houston, 1995; Chen & DeVaney, 2001). The percentage of those who have less than a three-month expenditure fund range from 60% to 79%.

2.1. Measuring emergency fund adequacy

Emergency fund adequacy is one factor that determines a person's financial capacity to weather a financial storm. Financial consultants tend to be interested in quickly identifying potential clients that have the financial capacity to face a financial emergency (Bruckenstein & Drucker, 2004). Emergency fund adequacy has been measured in relation to the various liquid-asset holdings of households. Liquid assets include "cash and near-cash items that can be readily converted to cash" (Garman & Fogue, 2003, p. 38). To evaluate levels of personal financial wellness, financial professionals have utilized a variety of guidelines when working with their clients. Greninger, Hampton, Kitt and Achacoso's (1996) financial well-being profile provides a range of financial ratios and their guidelines. These experts suggest that individuals and families should have a liquidity ratio (ratio of monetary assets to monthly expenditures) of 2.50 to 3.00. A rule of practice for financial professionals when they work with clients is to use the three-month guideline. Using this rate, individuals and families should have a liquid fund equal to the amount of three-month's worth of expenditures.

In terms of the levels of possible loss that is associated with an unplanned asset withdrawal, researchers have proposed three different levels of emergency fund measures: quick, intermediate, and comprehensive. Bi and Montalto (2004) reviewed these as following: "(1) monetary emergency fund: assets held in saving, checking, and money market account; (2) intermediate emergency fund: monetary assets plus CDs and saving certificates; and (3) comprehensive emergency fund: intermediate assets plus the value of stocks and bonds" (p. 94). Bi and Montalto provided a summary of research that utilized these three levels of emergency fund adequacy. Although some researchers have focused on a single measure of

emergency fund (e.g., Chang, Hanna & Fan, 1997), other researchers used several measures of emergency funds for their tests (e.g., Bi & Montalto, 2004; Chen & DeVaney, 2001).

When determining emergency fund adequacy, researchers have utilized several different measures. As suggested above, Greninger and her associates (Greninger et al., 1996) proposed that emergency funds should be equal to 2.5 to 3 months worth of monthly expenditures; however, it is difficult for researchers to access valid expenditure data with asset and liability data in one dataset. Some researchers use income instead of monthly expenditures as a measure of emergency preparedness. This is a risky approach however. If a consumer is in a lower income bracket, or early in his or her employment life cycle, an emergency fund equals to the three-month income will generally be less adequate. Garman and Fogue (2003) suggest that emergency fund adequacy is dependent upon family structure and composition. Despite these factors, some researchers continue to use income figures as proxies for emergency fund adequacy. For example, three months before-tax income has been used in various studies (e.g., Chen & DeVaney, 2001; Ding & DeVaney, 2000; Huston & Chang, 1997).

A recent study that was conducted using Australian data used different measures of emergency fund adequacy. Worthington (2004) used seven sequential questions to measure emergency funds for Australians. The first question measured households' ability to raise emergency funds of \$2,000 in one week. Then, the next six questions measured the possible sources of emergency funds. The sources included (1) their own savings (monetary assets), (2) loan from a deposit-taking institution, (3) high interest loan from finance company, (4) credit card, (5) family or friends, and (6) welfare or community organization. Whether or not the degree of information acquired from the examination on the possible loan sources and the emergency fund adequacy is valid, Worthington's research adds useful insights to emergency fund measurement procedures. As Worthington concluded, there are opportunity cost effects and other non-income related factor effects present when someone attempts to accumulate an emergency fund. The funds held for emergency purposes (especially monetary assets) have generally large opportunity costs, and these opportunity costs are different for various income groups. This insight leads to a discussion of which households should establish an emergency fund; specifically, should all households establish an emergency fund? Hatcher (2000) examined the costs and benefits of establishing an emergency fund. He concluded that limited resource group households receive greater advantages establishing an emergency fund.

2.2. Empirical research on emergency funds

Several demographic and psychosocial variables have been identified as factors associated with emergency fund holdings. Of those demographic variables, age has been found to have a positive relationship with an adequate emergency fund (Bi & Montalto, 2004; Chen & DeVaney, 2001; Huston & Chang, 1997; Worthington, 2004). The positive relationship between age and emergency fund adequacy is an anticipated finding based on the life cycle hypothesis of consumption and savings. Other demographic variables, such as education, ethnicity, and marital status have been found to be significantly related to emergency fund holdings. Those who have higher levels of education (e.g., Chen and DeVaney), White

households compared to Black (Chen & DeVaney, 2001; Huston & Chang, 1997; Bi & Montalto, 2004), and those who are married (Chen & DeVaney, 2001) tend to have adequate emergency funds compared to others.

Emergency fund holdings are directly related to savings behavior. Therefore, variables that affect savings behavior also have been found to be significant predictors of emergency fund holdings. Among the psychosocial variables, savings motive, income uncertainty (e.g., expectation for future income changes), and risk tolerance have been examined. Those who have a savings motive for emergencies tend to meet the three-month guideline. Those who expect their future income to decline tend to be less likely to meet the guideline. Those who have higher levels of risk tolerance are more likely to meet the guideline (Bi & Montalto, 2004; Chen & DeVaney, 2001).

3. Methodology

3.1. Survey

A survey instrument was created to inquire about individual respondent and family financial behaviors and satisfaction. A questionnaire was developed based on items presented in previously published research on financial behaviors and satisfaction (e.g., Hira & Mugenda, 1999; Joo & Grable, 2004; Porter & Garman, 1993). A series of pilot studies were conducted to ensure the validity and reliability of the questionnaire. The final survey instruments were mailed to approximately 2,000 individuals and families in two cities in Texas and Colorado. The city in Texas was selected based on convenience. The city in Colorado was selected based on its demographical (mainly ethnic background) composition that matched the entire U.S. population census data. Names and addresses for the sample population were obtained from the most recent telephone book available at the time. Those who did not have telephone service with a specific telephone directory provider (Southwestern Bell and Pacific Bell), and those who chose not to publish a telephone listing, were excluded from the sample frame. Even though this sample limitation could be problematic for some types of research, this sampling procedure has been widely practiced in social science studies. Out of the 2,000 original sample list, 381 surveys were returned with undeliverable addresses. The modified Dillman (2000) survey technique was employed, utilizing original mail, post card follow up, and a second mailing. Out of possible 1,619 respondents, a total of 404 usable questionnaires were returned.

3.2. Demographic characteristics

Over one-half (55.2%) of the respondents were male. The majority of respondents (65%) were married. More than half of the respondents' partners were employed. The majority of respondents were employed and 15.6% were retired. Almost half of the respondents were employed at for-profit organizations. The majority of the respondents were White/Caucasians. The average age of respondents was 48.66 years with a standard deviation of 15.98 years. Detailed demographic characteristics are presented in Table 1 below.

Table 1 Demographic characteristics of the respondents

Characteristics/Category	Entire sample		Test sample	
	N	%	N	%
Gender				
Male	219	55.2	173	52.4
Female	178	44.8	157	47.6
Total	397	100.0	330	100.0
Marital status				
Never married	67	16.9	63	19.1
Not married but living with significant other	9	2.3	8	2.4
Married	258	65.0	212	63.1
Separated	2	.5	1	.3
Divorced	37	9.3	33	10.0
Widowed	23	5.8	12	3.6
Other	1	.3	1	.3
Total	397	100.0	330	100.0
Employment				
Self-employed	55	14.1	55	16.7
Employed part-time	32	8.2	32	9.7
Employed full-time	212	54.2	212	64.2
Retired	61	15.6		
Homemaker	9	2.3	9	2.7
Not employed	10	2.6	10	3.0
Other	12	3.1	12	3.6
Total	391	100.0	330	100.0
Race				
Caucasian/White	320	80.8	260	79.0
African American/Black	28	7.1	25	7.0
Hispanic/Latino	35	8.8	33	10.0
Native American	1	.3	1	.3
Asian or Pacific Islander	8	2.0	7	2.1
Other	4	1.1	3	.9
Total	396	100.0	329	100.0
Education				
Some high school or less	20	5.0	15	4.5
High school graduate	42	10.6	28	8.6
Some college	122	30.7	98	29.7
Associate degree	28	7.1	28	8.5
Bachelor's degree	74	18.6	68	20.7
Some graduate	34	8.6	30	9.1
Master's degree	44	11.1	32	9.7
Doctoral or professional degree	33	8.3	30	9.1
Total	397	100.0	329	100.0
Income				
Less than \$15,000	34	8.6	28	8.7
\$15,000 - \$24,999	42	10.6	33	10.3
\$25,000 - \$34,999	44	11.1	35	10.9
\$35,000 - \$49,999	53	13.4	38	11.8
\$50,000 - \$74,999	104	26.3	90	28.0
\$75,000 - \$99,999	55	13.9	44	13.7
\$100,000 - \$124,999	23	5.8	21	6.5
\$125,000 - \$149,999	9	2.3	9	2.8
\$150,000 and higher	24	6.1	23	7.2
Total	388	100.0	321	100.0
Household size	M= 2.6	SD = 1.3	M=2.7	SD = 1.3
Housing				
Own without a mortgage	88	22.2	38	11.6
Own with a mortgage	219	55.2	205	62.3
Rent	77	19.4	75	22.8
Living with relative or parents	7	1.8	7	2.1
Other	6	1.5	4	1.2
Total	397	100.0	330	100.0
Age	M=48.66	SD =15.98	M= 43.2	SD =13.1

3.3. Analysis

Researchers have acknowledged the difficulty of obtaining expenditure data and asset and liability data from a single secondary data source (Bi & Montalto, 2004; Chang et al., 1997). To minimize the errors in transferring variables between two different databases (e.g., expenditure variable from the Consumer Expenditure Survey and savings variable from the Survey of Consumer Finances), this research proposes the possibility of using subjective evaluations from researcher gathered surveys. The methodology that is utilized in this research is different from previous emergency fund studies in three major ways. First, this study uses subjective evaluations of emergency fund adequacy. Second, a non-parametric analysis is employed, and third, financial behavior variables are included in the analysis. The subjective evaluation of emergency fund adequacy that is used in this research is the perceived emergency fund adequacy by individuals and households.

This research also includes several financial behavior measurements in the analysis of emergency fund adequacy. Previous studies have limitations on variable selection because of the fact that large datasets often do not include specific financial behaviors, such as budgeting practices, credit card behaviors, and other financial planning actions. This research provides information on how some financial behaviors can be used to classify families and individuals into emergency fund adequacy groups and non-adequacy groups. Even though questions still exist in terms of measurement errors, the methodology used in this research provides an alternate to large quantitative survey methodologies typically used in personal finance research.

In this study, CART software by Salford Systems was used to analyze emergency fund adequacy. CART software uses the original classification tree formula developed by Breiman, Friedman, Olshen, and Stone (1984). The original decision trees were tested on a medical data analysis used to classify incoming patients into high-risk groups and low-risk groups based on given classification rules. Classification tree analysis is a non-parametric method. It does not require any model or functional forms of relationships. Classification tree analysis is a “form of binary recursive partitioning” (Lewis, 2000, p. 4). It is ‘binary’ because the tree assigns each respondent into one of two groups, and it is ‘partitioning’ because the data are split into sections or partitioned. Classification tree consist of a root node, internal nodes, and terminal nodes. Except the terminal nodes, all nodes have two daughter nodes. Classification tree have been used as a data mining technique. According to Kolyshkina and Brookes (2002), data mining is “a process that uses a variety of data analysis tools to discover patterns and relationships in data that may be used to make valid predictions” (p. 3). Data mining techniques have been used in a number of insurance and actuarial research studies (e.g., Francis, 2001).

CART has several advantages to offer as a data analysis tool. First, it does not assume normal distribution. CART can “handle numerical data that are highly skewed or multimodal, as well as categorical predictors with either ordinal or non-ordinal structure” (Lewis, 2000, p. 5). It is also easier to handle categorical variables with a large number of categories when CART is used. CART has unique methods for handling missing values. Instead of dropping a case that includes missing values, CART substitutes them with ‘surrogate splitters.’ The surrogate splitter “contains information that is typically similar to what would

be found in the primary splitter” (Salford-System, n.d.). Other advantages that CART offers includes (1) it does not require extensive time to model a complicated framework, (2) CART trees are easy to interpret, and (3) the method requires relatively little input. Classification tree analysis has several advantages over other parametric classification analyses, such as binary logistic regression and discriminant analysis. However, the limitations should be acknowledged. One of the limitations of classification and regression trees is that the outcomes become less stable as the size of the database falls. However, Feldman and Gross (2003) argued that “under logistic regression, the classification process generally remains completely opaque, even when it provides as accurate a classification as the data warrant” (p. 3). Feldman and Gross further state that for certain cases such as “default risk classification, whether transparency and ease of use are of paramount importance, a small loss in accuracy is not decisive” (p. 8).

As such, a classification tree analysis was conducted using CART by Salford Systems to determine who is and is not likely to meet the three month emergency fund guideline. 10-fold cross-validation and Gini splitting criterion were used. No specific penalty was given to variables. Descriptive statistics and other analyses were obtained using SPSS for windows.

3.4. *Dependent variable*

The dependent variable was a subjective evaluation of emergency fund adequacy by families and households as reported by survey respondents. Survey respondents were asked to answer the following subjective evaluation question about their emergency fund adequacy:

“If you lost your job today, how many months could you live using your savings?”

The answer categories ranged from (1) 0 months, (2) 1–2 months, (3) 3–4 months, (4) 5–6 months, (5) 7–8 months, (6) 9–10 months, (7) 11–12 months, (8) more than 12 months, and (9) don’t know. The following table shows the answer distribution by respondents.

One of the interesting insights provided in Table 2 is the number of respondents who said they do not know how many months they could live on their savings. It is possible that these are people who (1) don’t know how much they spend per month, (2) don’t know how much they have in their savings, or (3) don’t know how much they spend per month and how much

Table 2 Distribution of subjective emergency funds adequacy

	Frequency	Percent
0 Months	67	17.0
1–2 Months	81	20.5
3–4 Months	53	13.4
5–6 Months	38	9.6
7–8 Months	8	2.0
9–10 Months	5	1.3
11–12 Months	16	4.1
More than 12 months	87	22.0
Don’t know	40	10.1
Total	395	100.0

they have in their savings. This finding is consistent with what has been reported in the literature (Zagorsky, 2000). A group comparison using *t* tests was conducted to examine any systematic differences between the two groups; those who knew their emergency fund adequacy compared to those who did not know. One of the major differences between the two groups was their average age. Those who knew their emergency fund adequacy were much younger than those who did not know (45.3 years vs. 65.8 years). Another difference existed related to debts and savings. Those who knew their emergency fund adequacy had higher debt levels and lower savings ratios. In terms of employment status, 55% of those who did not know their emergency fund adequacy level were retired. Because of the nature of the question (i.e., ‘how many months will you live if you lost your job today?’), and the possible differences in financial situations, especially in asset portfolio and spending patterns, retirees ($N = 61$) were excluded from the sample for this study.

3.4.1. Variable coding

Even though current statistics on unemployment duration show that in some cases unemployment can last more than 20 weeks, this research used the three-month emergency fund guideline as the ratio benchmark. The average duration of unemployment during the time data were collected, was about 12 weeks. Among the non-retired respondents, those who answered that they can live zero months to two months ($N = 143$) were assigned 0 for the emergency fund inadequate group. Those who answered they could live three months or more ($N = 170$) were assigned 1. Those who did not answer the question or said they did not know ($N = 17$) were assigned as having missing values.

3.5. Independent variables

Independent variables included demographic and socioeconomic characteristics, financial behaviors and financial knowledge. Age, ethnicity, marital status, employment status, education level, income, household size, and housing type were included as demographic and socioeconomic characteristics. Age and household size were measured as continuous variables. Ethnicity, marital status, employment status, and housing type were categorical variables. The possible answer categories are presented in Table 1. CART does not require dummy coding of categorical variables; however, these variables were specified as categorical variables in the CART analysis. Education level and income were considered to be interval variables. Table 3 presents the list of financial behaviors that were included as independent variables. Demographic and socioeconomic variables are shown in Table 1.

In the questionnaire, 10 true or false questions were included to measure respondents’ financial knowledge. Examples of the questions used include (1) higher insurance deductibles lead to lower insurance premiums; (2) your credit reports are updated every three years, so negative information that occurred four years ago does not show on your current credit reports; and (3) state governments set the interest rate charged on major credit cards, like Visa and MasterCard. The answers were coded as one if a respondent had a correct answer and zero if a respondent had an incorrect answer. The scores were added to create a financial knowledge score. The average financial knowledge score for the sample was 7.4 with a standard deviation of 1.2.

Table 3 Financial behaviors variables

Financial behavior	Always	Usually	Sometimes	Never
I am aware of the total amount of money I owe.	63.8 %	30.1%	5.2%	0.9%
When I borrow money (for example, for a car or big purchase), I shop around for the lowest interest rate.	50.0	30.7	15.0	4.3
I spend more money than I earn.	4.2	11.5	48.2	36.1
I keep track of how much I spend on household expenses each month.	26.1	25.2	33.4	15.2
I balance my checkbook.	61.2	14.7	10.7	13.5
I pay credit cards in full each month and avoid finance charges.	27.8	21.0	23.8	27.5
I reach the maximum limit on my credit cards.	3.7	7.1	19.8	69.4
I obtain cash advances to pay money toward other credit balances.	1.2	.9	11.3	86.2
I have a weekly or monthly spending plan that I follow.	11.5	30.6	27.9	30.0
I have written down specific short-term, mid-term, or long-term financial goals.	8.2	17.9	30.9	43.0
I have a written comprehensive financial plan.	Yes 12.2%			
I have a complete and updated written will.	Yes 28.8%			
I save on a regular basis in addition to my retirement investments.	Yes 41.2%			
I have life insurance.	Yes 82.2			
I have auto insurance that meets the state requirement.	Yes 97.0			
I have medical insurance for my whole family.	Yes 87.2			
I have disability insurance.	Yes 57.4			

4. Results

The CART program identified the following tree (Fig. 1) with six terminal nodes as the one that provides the minimum misclassification cost rate. The cross-validated relative cost (can be interpreted as 1-r-square) was 0.411 and resubstitution relative cost of 0.313. The misclassification statistics that were obtained from the test sample show that the classification tree identified in this research classifies those who do meet the three-month guideline better than those who do not meet the guideline (84% correct and 75% correct, respectively). The prediction success statistics show that the classification tree offers an over 80% prediction success rate between the two groups. For those who meet the guideline, the prediction success is over 88%.

The classification tree shown in Fig. 1 presents useful insights into emergency fund adequacy. The first node (root node) in the classification tree starts with a question of whether a respondent saves regularly in addition to their retirement savings. When a respondent saves regularly he or she belongs to the terminal node 1 group. As such, he or she is classified as having met the three-month emergency funds guideline. The terminal node 1 statistics show that in the sample data, among those who save regularly, almost 88% meet the three-month guideline. If a respondent does not save regularly, he or she moves to the next node. In the second node, the respondent's credit card payment behavior is assessed. The respondent is

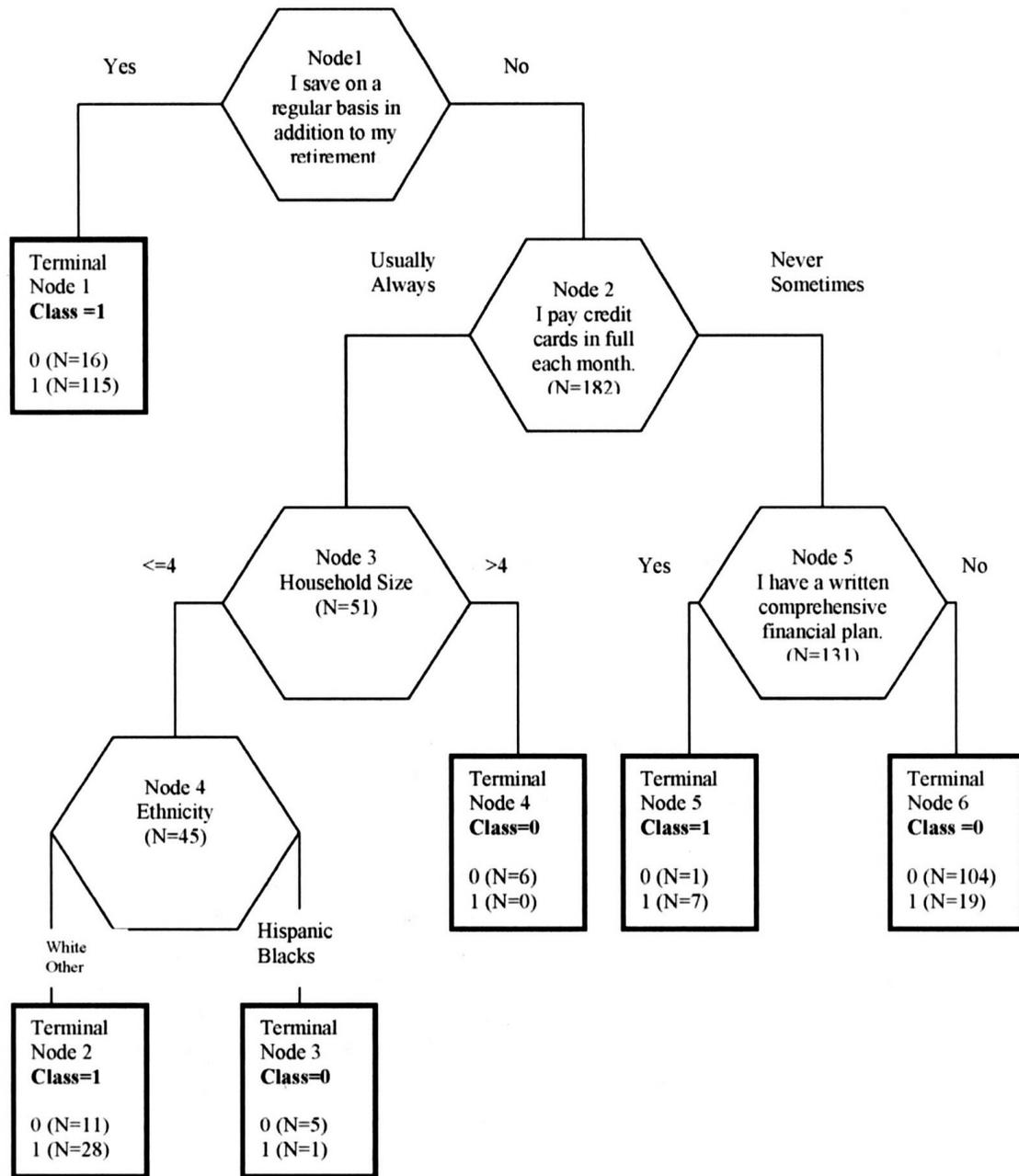


Fig. 1. Decision tree for emergency funds adequacy.

asked whether he or she pays credit cards in full each month, avoiding finance charges. If the respondent always or usually pays credit cards in full then he or she moves to node 3. When a respondent never pays credit cards' bills in full each month or sometimes pays credit cards bills in full, the process continues by going to the next question (node 5); whether the respondent has a written comprehensive financial plan or not? If the same respondent has a financial plan, the respondent is predicted to meet the three-month emergency fund guideline (terminal node 5). In the data, 87.5% of the people who never or sometimes pay credit cards

Table 4 Variable importance

Variable	Importance in the model	Importance when only the primary splitters were considered
I save on a regular basis in addition to my retirement investment.	100.00	100.0
I pay credit cards in full each month and avoid finance charges.	83.25	18.27
I spend more money than I earn.	43.49	
I have a written comprehensive financial plan.	31.31	15.08
Income	30.64	
I have a complete and updated written will.	18.30	
Age	9.22	
Household size	8.06	8.06
Ethnicity	6.11	6.11

in full and have financial plan met the three-month guideline. For someone who never or sometimes pays credit cards in full and does *not* have a written comprehensive financial plan, the respondent is classified as not meeting the three-month emergency fund guideline (terminal node 6). The 104 cases in terminal node 6 represent 84.6% of the group.

On the other hand, if a respondent always or usually pays credit cards in full and avoids finance charges, this respondent goes to the next node (node 3). A question is asked if whether he or she has a household size of greater than four persons. If the respondent has a household size greater than four, he or she is categorized into the non-adequacy group (terminal node 4). If the respondent lives in a household size smaller than four, he or she moves to the next node (node 4); ethnic group affiliation. If the respondent is either Hispanic or African American, he or she belongs to the non-adequacy group (terminal node 3), and if the respondent had another ethnic group identity, he or she was predicted to be in the adequacy group (terminal node 2).

Respondents' financial behaviors play significant roles in classifying families and individuals by their emergency fund adequacy. Table 4 shows each variable's importance when grouped together with all the variables used in this study. The second column in the table shows each variable's importance in the model, and the third column shows which variables were most important when the primary splitters were considered. The variable importance statistics also show what variables might be masked by other factors. The income and spending pattern (current financial situation from the question of "I spend more money than I earn") were not major splitters even though their relatively high importance was noted. Age was not a major splitter in the current decision tree.

5. Discussion

In this research, a less common measure of emergency fund adequacy was used to measure financial capacity. Respondents were directly asked about how many months that

they could live off their savings, if they lost their jobs today. The measurement errors that are inherent to this question are assumed similar to measurement errors in other quantitative surveys (e.g., asking respondents to report the amount of money that they have in savings account, or brokerage account, and so forth). The use of this proxy measure for the emergency fund adequacy is still exploratory; however, it has been noted that consumers' subjective evaluation can represent the actual situation (Mitchell & Helson, 1990; Porter & Garman, 1993).

This subjective evaluation of emergency fund adequacy is different from the one Bi and Montalto (2004) used. Bi and Montalto used the following Survey of Consumer Finance question: "About how much do you think you (and your family) need to have in savings for emergencies and other unexpected things that may come up?" The primary difference between the current measure of subjective evaluation of emergency fund adequacy and the SCF question is that the current measure of subjective evaluation reflects a respondent's emergency fund holdings compared to his or her monthly expenditures. The respondents in this study were asked to choose whether they can live 0 months, 1–2 months, 3–4 months, 5–6 months, 6–12 months, or over 12 months using their savings if they lost job today. Because the current question asked about their savings, it is a close proxy of the monetary liquidity ratio.

6. Implications

The findings from this research have useful implications for practitioners, consumers, researchers, and policy makers. First, for financial consultant practitioners, the findings suggest that a series of questions can be used when working with prospective clients to separate target profile clients from others. For example, assume that a financial consultant is meeting with a prospective client for the first time. The consultant wants to create a dialog with the prospect that is informative in determining if the prospect would make a good client to work with in the future. The consultant does not want to ask specific questions related to the prospect's income, net worth, spending habits, or other dollar specific behaviors at the early stage of the client engagement process. Instead, the consultant could apply the results from this study by asking if the prospect is actively saving outside of his or her 401(k) plan. If the answer is yes, the prospect is also likely to have a high subjective evaluation of net worth, which suggests a potential target client.

If the answer is no, the consultant could then ask if, on a monthly basis, the prospect always or usually pays credit cards in full each month or whether he or she is making payments. If the prospect indicates making payments the consultant could then ask if the person has a written financial plan in place at the current time. If the answer is yes, the prospect is likely to have a higher emergency preparedness than someone who answers no. The results from this study suggest that anyone who fails to pay their credit cards in full on a monthly basis without having a written financial plan may need more remedial assistance than what the majority of financial consultants practicing today provide.

If the prospect always pays credit cards in full each month the consultant would then ask about how many children live in the prospect's household. A response that indicates having

more than four people in the household is a sign of a lower level of financial capacity to handle financial emergencies.

The only prospects remaining are those that are not saving money outside of their retirement plan, but are paying credit cards in full each month and living in a household with less than four individuals. For these prospects, the consultant would then use the final determining factor indicating financial capacity to handle a financial emergency, namely, racial or ethnic background. Non-Hispanic Whites, Asians, and others are predicted, in this study, to have a greater financial capacity than Hispanics and African Americans.

For researchers, this research has three major implications. First, the use of subjective evaluations of emergency fund adequacy may offer an alternative to common emergency fund data gathering methods. Although validity issues still need to be answered, researchers should consider examining the possibility of including subjective perception questions as part of quantitative database questionnaires. Future research on the association between subjective evaluation and objective status in personal finances is recommended. Second, incorporation of financial behaviors as predictors of emergency fund adequacy may help fill the void in understanding why certain individuals and groups of households are able to reach and maintain financial standards. Many previous studies have been limited in the use of behavioral questions because of the type of databases being used. As such, findings have tended to focus on the role of demographic and socioeconomic factors as predictors of financial wellness at the expense of psychosocial and behavioral factors. Third, utilizing classification trees as an analysis method offers researchers an intuitive data reduction process that can handle both continuous and categorical variables. Findings produced using the method are logical, easy to interpret, and quite useful in making predictions about individual and group behavior.

Findings from this study have potential policy implications. First, policy makers may appreciate the linear description of the determinants of emergency fund holdings. The classification tree provides a distinct map that illustrates what behaviors, psychosocial inputs, demographic factors, and socioeconomic variables work together with a person's willingness and ability to save for emergencies.

This research impacts a broader policy issue as well, namely, racial and ethnic differences in wealth accumulation. The accumulation of wealth in the United States is distinctly divided by racial categorization (Henry, Weber & Yarbrough, 2001). African American households tend to hold about half of the net assets held by White/Caucasian households (Oliver & Shapiro, 1995). Emergency savings funds are a component of net worth, so it is not a surprise that African American households were much less likely to have an adequate emergency fund in this research. Much of the research conducted to test racial wealth differences has focused on four hypotheses: (1) discrimination, (2) education variations, (3) social influences, and (4) asset choice. Almost all racial differences studies use large national databases, which tend to ask few financial behavior questions. The result is that quantitative racial differences have tended to be reported based on purely demographic and socioeconomic factors (e.g., Coleman, 2003; Plath & Stevenson, 2000). Although socioeconomic factors certainly play a role in how and why people save for emergencies, findings from this study suggest that a much more complete picture can be created by understanding the financial behaviors people engage in on a daily basis.

These implications need to be tempered by potential limitations inherent in this study. For instance, the sample was not truly representative on the entire United States. Although efforts were taken to match the demographic characteristics of the sample to the broader population, there can be no assurance that the findings will be replicated with a different sample. In addition, the way in which respondents were chosen, although random, limited the sample to those who published their address in a phone book. It is possible that others might have responded differently to the questions asked.

In summary, creating educational outreach efforts related to helping individuals understand the costs and consequences of maintaining credit balances may also turn the tide for families facing an emergency. Encouraging financial planning for all Americans, not just high income and net worth households, is something that might be considered. To be effective, this change in the way Americans plan for the future will almost need to be policy driven. As these examples suggest, research using classification trees can be quite effective in prescribing policies that can directly influence a person's willingness and ability to improve their financial situation.

7. Conclusions

This research examined determinants of emergency fund adequacy using a classification tree and a subjective measure of emergency fund adequacy. The findings from this research illustrate that financial behaviors can be used as predictors of emergency fund adequacy. Not only are financial behaviors possible predictors, they may be better predictors for emergency fund adequacy than some demographic and socioeconomic variables. The classification tree from this research shows that respondents' savings behavior and credit card usage behavior are closely related to emergency fund adequacy. Whether a respondent has a written comprehensive financial plan also plays an important role in predicting emergency fund adequacy. Only two demographic variables, household size and ethnicity, were significant splitters in this research.

This research also presented some practical implications of classification tree methodology in segmenting prospective financial consulting clients. Classification trees are very practical. Questions like, "Who should develop an emergency fund?" "Who is more at risk when emergency occurs?" and "What are the behavioral indicators that predict emergency funds inadequacy?" can be answered with a classification tree.

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