Jurnal Ekonomi Malaysia 46(1)(2012) 27 - 37

Predictors of Investment in Risky Assets among Malaysian Families

(Peramal Pelaburan Aset Berisiko dalam Kalangan Keluarga di Malaysia)

Husniyah Abdul Rahim
Zuroni Md. Jusoh
Universiti Putra Malaysia

M. Fazilah Abdul Samad (*the late*)
Universiti Malaya

ABSTRACT

Investment, as a strategy to enhance financial well-being, is exposed to high expected risk in order to gain high expected returns. This study focused on the effects of personality and behavioural factors in predicting investments in risky assets. The personality factors studied were future time orientation, financial risk tolerance and self-worth, whilst the behavioural factors concerned were the dimensions of financial management practices of families. Quota sampling based on ethnicity was used to sample a total of 800 respondents, namely the reported family financial managers from families residing in Peninsular Malaysia. Investment in risky assets was based on the self-reported investment in stocks. Binary logistic regression analysis revealed financial risk tolerance, self-worth, record-keeping, credit, savings and risk management as significant predictors of investment in risky assets. Family financial managers who were more risk-tolerant with higher self-worth tend to invest in risky assets. Furthermore, those who perform record-keeping; regularly save; and managing risk well were also more likely to invest in risky assets. However, those managing credit wisely were less likely to invest in risky assets. The most influential factors for predicting investment in risky assets found in this study were savings, followed by self-worth, risk practices, record-keeping and financial risk tolerance. The findings provided evidence that specific personality factors and financial management practices did predict investment in risky assets. Knowing these factors will enable financial planners to identify those with potential to invest in this type of asset and encourage them to invest in risky assets in order to gain greater return from their investment. As for those families having such personality and performing influential financial practices, they would realise their capability in risky investment. However, for those having low self-worth, less tolerating with financial risk and hardly did those influential financial practices, they could be trained to make them capable to invest in risky assets. More families would have the potential to invest in risky assets that can lead to financial stability in the long run. Additionally, this will contribute to the economic growth of the country.

Keywords: financial management practices; investment; risky assets

ABSTRAK

Pelaburan sebagai suatu strategi untuk meningkatkan kesejahteraan kewangan adalah terdedah kepada jangkaan risiko yang tinggi dalam usaha untuk memperoleh jangkaan pulangan yang tinggi. Kajian ini memfokus kepada kesan faktor-faktor personaliti dan perlakuan bagi meramalkan pelaburan dalam aset berisiko. Faktor-faktor personaliti yang dikaji adalah orientasi masa hadapan, toleransi risiko kewangan dan nilai-diri manakala faktor-faktor perlakuan adalah dimensi-dimensi amalan pengurusan kewangan keluarga. Persampelan kuota berdasarkan etnik digunakan untuk mensampelkan sejumlah 800 responden yang merupakan pengurus kewangan keluarga daripada keluarga di Semenanjung Malaysia. Pelaburan dalam aset berisiko adalah berdasarkan kepada pelaburan dalam stok sepertimana yang dilaporkan oleh mereka. Analisis regresi logistik binomial mendapati toleransi risiko kewangan, nilai-diri, penyimpanan rekod, kredit, tabungan dan pengurusan risiko sebagai peramal signifikan terhadap pelaburan dalam aset berisiko. Mereka yang lebih tinggi toleransi terhadap risiko dan mempunyai nilai-diri yang tinggi cenderung untuk melabur dalam aset berisiko. Lanjutan dari itu, mereka yang melakukan penyimpanan rekod, membuat tabungan secara berkala dan mengurus risiko dengan baik juga didapati lebih cenderung untuk melabur dalam aset berisiko. Walau bagaimanapun, mereka yang menguruskan kredit secara berhemah didapati kurang berkemungkinan untuk melabur dalam aset berisiko. Oleh itu, faktor yang paling mempengaruhi bagi meramalkan pelaburan dalam aset berisiko yang diperolehi daripada kajian ini adalah tabungan, diikuti dengan nilai-diri, amalan risiko, penyimpanan rekod dan toleransi risiko kewangan. Dapatan ini memberikan bukti bahawa faktor-faktor personaliti tertentu dan amalan-amalan pengurusan kewangan merupakan peramal berpengaruh bagi pelaburan dalam aset berisiko. Dengan mengetahui faktor-faktor berkenaan, ini dapat membolehkan perancang kewangan untuk mengenalpasti mereka yang berpotensi untuk melabur dalam jenis aset ini dan menggalakkan mereka untuk melabur dalam aset berisiko bagi memperoleh pulangan yang lebih tinggi dari pelaburan. Bagi

keluarga yang mempunyai personaliti sedemikian dan melakukan amalan kewangan yang berpengaruh berkenaan, mereka akan menyedari keupayaan mereka dalam jenis pelaburan berisiko. Walau bagaimanapun, bagi mereka yang mempunyai nilai diri yang rendah, kurang bertoleransi terhadap risiko dan jarang melakukan amalan kewangan yang berpengaruh berkenaan, mereka boleh dilatih supaya menjadi berupaya untuk melabur dalam aset berisiko. Dengan itu, lebih banyak keluarga akan mempunyai keupayaan untuk melabur dalam aset berisiko yang boleh menghasilkan kestabilan kewangan dalam jangka panjang. Tambahan pula ini dapat menyumbang kepada pertumbuhan ekonomi Negara.

Kata kunci: amalan pengurusan kewangan; aset berisiko; pelaburan

INTRODUCTION

Resources are allocated by families for expenditures, such as purchasing non-durable and durable goods, namely electrical appliances, houses, and land; paying for services, such as for utilities and automobile servicing; risk protection; and credit repayment. The surplus of income is then utilized for savings and investment. Savings, as compared to investment, are concerned with safety and liquidity of the money retained. Both savings and investment can later be used to purchase assets resulting in household portfolios due to the ownership of various assets by households. Household portfolios are comprised of financial assets, real assets, and liabilities held by households (Haliassos 2006). Hence, household portfolios consist of financial assets, such as liquid accounts, stocks, bonds, and shares in mutual funds, as well as real assets, which include tangible assets such as gold, silver, diamond, art, and real estate (Jones 2008). As contended by Haliassos (2006), household portfolios' study is a partner to corporate finance and asset pricing due to the similar investment holdings by households or by companies. It is also a study that cuts across economics and finance fields. The analyses of savings and investment extend outside the boundaries of economics to incorporate finance are concerned with portfolio choice.

Money is secured by depositing it in savings accounts or current accounts of financial institutions. However, investments are generally not secure, as they vary in terms of expected risk and expected return. High expected risks in investments are associated with high expected returns. In order to gain higher expected returns, individuals must be willing to accept the higher expected risks that may result in higher financial losses. Hence, investment is one strategy to enhance financial well-being as a result of the increase in income. By choosing risky assets due to high expected returns, the safety component and liquidity component of surplus money that would otherwise have been secured in a savings account becomes an opportunity cost involved in the decision. The expected risk from such investment may potentially include the total loss of the principal of the investment. Consequently, individuals may have to assess their tolerance towards the expected risk faced in their investment prior to their investment in risky assets so as to determine whether they are psychologically prepared for potential negative consequences. The risk profile examines the extent to which an individual is tolerant towards risk, assessing whether an individual is risk-tolerant individuals or risk-averse. Several researchers have determined financial risk tolerance to be a fundamental issue underlying financial decisions (Grable & Lytton 1999), especially in investment suitability, both corporate and personal settings (Garman & Forgue 2000). Individuals facing the risks should also be financially prepared. Hence, financial management practices that are associated with preparation for financial needs should not be overlooked especially for financial management practices that are more likely to predict good financial well-being.

In conjunction with the above, the study performed will be able to answer the following research questions regarding investment decision. Do individuals in Malaysia behaving accordingly to their financial risk tolerance, with those investing in risky assets possessing high financial risk tolerance? Are those investing in risky assets more future-oriented individuals or are they high self-worth individuals? What are the financial management practices that are likely to predict investment in risky assets by families and who are those families? In other words, are those investing in risky assets prepared financially and psychologically to face the expected risks associated with their investments? As certain socioeconomic characteristics have positive influences on investment decisions, selected socioeconomic characteristics were used as control variables.

LITERATURE REVIEW

Past studies on the investment in risky assets have mainly focused upon socioeconomic and psychological factors. Studies concerned with psychological factors are more concentrated on financial risk tolerance. As for studies found on the associations of financial management practices with investment in risky assets, those are limited to the area of savings and do not involve other components of financial management practices.

SOCIOECONOMIC CHARACTERISTICS AND INVESTMENT IN RISKY ASSETS

The socio-economic characteristics of individuals and households were found to affect the decision to invest in risky assets. Socio-economic characteristics that influenced participation in risky assets included education, ethnicity, gender, income, income risk, and homeownership (Guiso, Haliassos & Jappelli 2001; Bertaut & Starr-McCluer 2002; Iwaisako 2003; Storesletten, Telmer & Yaron 2004; Cocco, Gomes & Maenhout 2005; Guiso & Jappelli 2005; Campbell 2006; Gutter & Fontes 2006; Schubert 2006; Feng & Seasholes 2007; Cardak & Wilkins 2008).

In regards to education, using the US Survey of Consumer Finances 1983, Haliassos and Bertaut (1995) found that education increased the probability of stock ownership. Schooley and Worden (1999) and Bertaut and Starr-McCluer (2002), and studies in other countries also reported similar results. Guiso et al. (2001) used the Italy Bank of Italy Survey of Household Income and Wealth 1989 and determined that education positively affected the risky asset ratio of Italian investors. Dutch households exhibited a corresponding influence of education on risky asset ratio. Hochguertel (2003) who determined the influence of education on ratio of safe assets to financial assets found a negative effect of education on the ratio of safe assets to financial assets. This implied that the effect of education on the risky assets ratio among Dutch households was also positive, meaning that highly educated households were more likely to invest in risky assets. Consistent results were found in studies conducted in other countries (Yamishita 2003; Rosen & Wu 2004; Christiansen, Joensen & Rangvid 2006; Cardak & Wilkins 2008).

The effect of ethnicity on risky asset holdings was studied by Gutter and Fontes (2006). Ownership of risky assets that was stated by these researchers as stocks and businesses was measured as a percentage of risky assets to the total financial assets. In terms of the likelihood to hold stocks and transaction accounts, black households were less probable than white households to hold them (Chiteji & Stafford 1999; Gutter & Fontes 2006). The tendency to own transaction accounts and stocks among black families was influenced by the possession of similar assets by their parents (Chiteji & Stafford 1999). The result, which utilised data from the 2004 Survey of Consumer Finances, revealed that white families were two times more likely to own risky assets as black families (Gutter & Fontes 2006).

Self-employed and retired US households who were believed to be facing labour income risk were found to be less likely to hold risky asset share (Bertaut & Starr-McCluer 2002). Retired households had lower income as compared to working households, as retirees faced higher labour income risks than those working. Earned income exhibited a positive association with risky investing (Storesletten et al. 2004; Cocco et al. 2005). The effect of homeownership on risky asset holdings had been studied separately from real estate assets. A positive association of homeownership with risky asset holdings among Australian households was found by Cardak and Wilkins (2008), who argued the relationship was the result of access to cheap mortgage-backed credit.

FACTORS RELATED TO INVESTMENT IN RISKY ASSETS

In addition to socioeconomic characteristics affecting investment in risky assets, other factors were found to be influencing this investment decision. Among the factors identified from past studies were investment knowledge, financial awareness, savings motive, credit constraints, health risk, and risk preferences (Bertaut & Starr-McCluer 2002; Guiso, Haliassos & Jappelli 2002; Graham et al. 2004; Corter & Chen 2006; Haurin & Morrow-Jones 2006; Shum & Faig 2006; Cardak & Wilkins 2008). However, there are no studies found on the direct influence of personality variables, such as future time orientation and self-worth, on investment in risky assets. Past research focused on the effect of financial risk tolerance on the participation in risky assets.

Saving motives affected the equity share in portfolios differently. Savings intended for purchasing or building a house and for businesses had negative effects on equity shares among households. It is believed that savings made by households would reduce available money to invest and thus not much money are available for them to invest in risky assets. An inverse association is expected for savings and investment, especially in stock market. In contrast, however, Shum and Faig (2006) found different result regarding savings intended for retirement. The retirement savings had a positive effect on equity share of portfolio. The portion invested in equity or the risky assets was found to increase by having this saving motive among the households. This might be due to the fact that savings for retirement were made in the form of high return investments.

On the financial risk tolerance effect, Guiso et al. (2001), and Rosen and Wu (2004) found that households who were more tolerant towards risk or less risk averse were more likely to purchase risky assets. The results concluded that high tolerance of financial risks by the households led to portfolios with higher portions of risky assets. Similar results were found in other studies (Bailey and Kinerson 2005; Jacobs-Lawson and Hershey 2005; Cardak and Wilkins 2008), suggesting that an individual's risk tolerance was a very strong predictor of choice behaviour in an investment situation.

In conclusion, significant effects on decisions to invest in risky assets were found among predictors, such as education, ethnicity, gender, income, income risk, homeownership, and financial risk tolerance. For the influence of financial management practices on risky investing, studies were limited to savings motives.

RESEARCH METHODOLOGY

A total of 800 respondents were selected from four regions in Peninsula Malaysia, comprised of the northern, central, eastern and southern regions. The respondents' were the reported family financial managers from families residing in Peninsula Malaysia. Family financial managers were identified as those managing the financial matters of the family. The sample size was determined by using a published table by Yamane (1967). For a population of more than 100,000, with a sampling error of 5 percent, the confidence level of 95 percent and the degree of variability of 50 percent, the sample size would be 400.The degree of variability used indicated the maximum variability in a population that reflected more heterogeneous population. The size of the sample is also dependent upon the type of data analysis. A sample size up to 500 was needed (Israel 1992) for data analysis utilising advanced statistical analysis, such as binary logistic regression. Thus, a sample of 800 families was chosen after considering the above factors.

The quota sampling imposed on the ethnicities of the respondents resulted in a sample mix of 480 Malays, 240 Chinese and 80 Indians. A ratio of 60 to 30 to 10 was used for the Malay, Chinese, and Indian ethnicities respectively (Population and Housing Census of Malaysia 2000). East Malaysia was excluded, as it did not represent the ethnicities of interest in the population. The residing areas of the respondents were in a ratio of 60 to 40 for the urban and rural areas (Economic Planning Unit 2006). According to Cooper and Schindler (2003), quota sampling is a non-probability sampling method and a type of purposive sampling that is used to improve representativeness. One state was chosen from each region and public and private sector offices were identified from the telephone directory. Urban families were identified from their residential areas that were managed by municipal and city councils. Rural families were determined by their residential areas that were managed by the district council (Population and Housing Census of Malaysia 2001). Questionnaire forms were sent to officers in charge that distributed the forms to the respondents and were self-administered by the respondents. The questionnaire was developed based on questions or scales that had been adopted or adapted from previous research. Apart from the socio-economic background of the family, the survey consists of questions on financial risk tolerance, future time orientation, self-worth, and financial management practices.

Future time orientation was measured using the Future Time Perspective Scale developed by Hershey and Mowen (2000). The construct, comprised of six items, was a general measure of personality that measures the extent to which individuals enjoy thinking about and planning for the future. Financial risk tolerance in this study adopted measurements by Jacobs-Lawson (2003) with six items. Hira and Mugenda's (1999) scale was used for measuring the self-worth of the financial manager. The four-item scale looked into the respondents' general perception of themselves.

Several dimensions of financial management practices were considered, including financial planning, cash-flow, credit, savings, and risk management. The cash-flow dimension was separated into two factors resulted from factor analysis, namely 'record-keeping' and 'budgeting'. Participation in risky assets was based on the self-reported investment in stocks by the respondents. The statement 'Invested some money in stocks' was recorded into two categories, namely the 'non-participation in risky assets' and 'participation in risky assets'. Those with score 1 indicated individuals that never invested in any risky asset (stock) and those that invested in risky assets were those with scores 2 to 7. Binary logistic regression was used to determine the probability to invest in risky assets by families. Selected socioeconomic variables were introduced in the first step of the model to control possible influence, followed by future time orientation, financial risk tolerance, self-worth, and financial management practices dimensions in the second step of the regression analysis.

RESULTS AND DISCUSSION

PROFILE OF THE RESPONDENTS

The socioeconomic profile of the respondents is presented in Table 1. Other than representing the quota for ethnicities in Malaysia, as the study was based on quota sampling, the sample was fairly distributed among various levels of age, education, household size, and household income. Length of working experience and length of marriage of respondents were also fairly spread, as these were often related to the age of the respondents. Almost half of the respondents were between 30 and 40 years old; and had been working and married for more than 10 years. Almost three-quarters of the respondents were middle aged.

In terms of monthly household income, almost half of the respondents were earning more than the average monthly household income of the Malaysian population of RM3,249 (Economic Planning Unit 2006). The average monthly household income for the sample was RM5,705, which is greater than the average income of the population. All the families in the samples had household income above the poverty line of RM687 for urban areas and RM698 for rural areas (Economic Planning Unit, 2006).

Referring to the education level, slightly more than half of the respondents were male and possessed education at the secondary level, followed by those who were graduates. About half of the sample was above the average household size of 4.5 for the population (Economic Planning Unit 2006). The average household size of the sample was 5.0 and was almost representative of the population. About three-quarters of the families in

TABLE 1. Profile of the Respondents

Socioeconomic Characteristics		Frequency (%) (N = 800)	
Age (years old)	Less than 30	148	(18.5)
	30 to less than 40	343	(42.9)
	40 to less than 50	242	(30.3)
	More and equal to 50	67	(8.4)
Gender	Male	465	(58.1)
	Female	335	(41.9)
Educational Level	Primary	294	(3.6)
	Certificate	341	(54.3)
	Diploma	441	(18.0)
	Degree/Professional	93	(24.2)
Working Experience (years)	0 to 5	142	(17.8)
	6 to 10	280	(35.0)
	11 to 15	149	(18.6)
	16 to 20	118	(14.8)
	More than 20	111	(13.9)
Length of marriage (years)	0 to 5	261	(32.6)
	6 to 10	236	(29.5)
	11 to 15	136	(17.0)
	More than 15	167	(29.0)
Household Size	Less than 5 persons	396	(49.5)
	More and equal to 5 persons	404	(50.5)
Household Income	RM700 to less than RM2,000	95	(11.9)
	RM2,000 to less than RM4,000	316	(39.5)
	RM4,000 to less than RM6,000	159	(19.9)
	RM6,000 to less than RM8,000	91	(11.4)
	More and equal to RM8,000	139	(17.4)
Homeownership of Family	Yes	571	(71.4)

the sample owned at least a house, at minimum, alongside other assets.

RELIABILITY COEFFICIENTS FOR CONSTRUCTS

The reliability test coefficients for the constructs used are displayed in Table 2. The scale's internal consistency is one of the main issues in assessing reliability. This refers to the degree to which the items that make up the scale measure the same underlying construct and is indicated by the Cronbach's alpha coefficient. The Cronbach's alpha for all the constructs recorded high reliability with coefficient values above 0.7, as suggested by Nunnally and Berstein (1994).

TABLE 2. Reliability Coefficients for Constructs

Constructs	Number of Items	Cronbach's Alpha
Future Time Orientation	4	0.802
Financial Risk Tolerance	6	0.808
Self-worth	4	0.896
Financial Planning	10	0.909
Cash-flow 'record-keeping'	4	0.813
Cash-flow 'budgeting'	7	0.917
Credit	3	0.825
Savings	4	0.817
Risk	4	0.841

The alpha values for future time orientation, financial risk tolerance and self-worth constructs are between 0.802 and 0.896. The financial management practices, with seven factors extracted using factor analysis, have high alpha values between 0.813 and 0.917. It is concluded that the items in each of the constructs reliably measured the concepts that the respective items were intended to measure.

PREDICTORS FOR INVESTMENT IN RISKY ASSETS BY FAMILIES

Table 3 tabulates the results of the binary logistic regression, with socioeconomic characteristics as control variables, in determining the influence of personality factors and behavioural factors on participation in risky assets. The fitness of the models iss displayed below the results of the regression.

The statistics show that both models were fit based on the significant Omnibus Test and a non-significant Hosmer and Lemeshow Test, with Model 2 a better model than Model 1. The socioeconomic characteristics in Model 1 only explained nine percent of the variance in investment in risky assets by the families. By introducing the personality variables and financial management

practices in Model 2, they contributed an additional explained variance of 15.4 percent. The second model was able to explain 24.4 percent of the variance in investment in risky assets. The hit ratios for both models were moderate, reflecting that the models were moderately able to classify those individuals into risk tolerant and risk aversive categorie based on the socioeconomic characteristics only and based on the socioeconomic characteristics, personality variables and financial management practices respectively.

Model 1 revealed that being a Chinese family relative to an Indian family was a significant positive predictor (B = 0.560;Wald = 4.059; p = 0.044) in predicting participation in risky assets. Respondent's working experience (B = –0.032; Wald = 7.781; p = 0.005), however, was significant, but negatively predicted participation in risky assets. Household income of the family was found to be positively (B = 0.903) significant (Wald = 8.623; p = 0.003) in predicting participation in risky assets. Thus, significant influence was found regarding participation

TABLE 3. Predictors for Participation in Risky Assets

	Model 1			Model 2		
Constructs	B(S.E.)	Wald	Exp (B)	B(S.E.)	Wald	Exp (B)
Residential Areas (Urban)	0.203	1.714	1.225	0.019	0.013	1.019
	(0.155)			(0.169)		
Ethnicity		10.343			12.076	
Ethnicity (Malay)	-0.029	0.014	0.971	-0.202	0.539	0.817
	(0.252)			(0.275)		
Ethnicity (Chinese)	0.560	4.059*	1.751	0.508	2.843^{+}	1.662
	(0.278)			(0.301)		
Respondent's Education Level	0.046	1.772	1.047	0.043	1.354	1.044
	(0.035)			(0.037)		
Respondent's Work Experience	-0.032	7.781**	0.968	-0.017	1.746	0.984
	(0.011)			(0.012)		
Household Income	0.903	8.623**	2.466	0.397	1.426	1.487
	(0.307)			(0.332)		
Homeownership	0.012	0.005	1.012	-0.198	1.115	0.820
	(0.173)			(0.188)		
Household Size	0.076	2.224	1.078	0.025	0.210	1.025
	(0.051)			(0.054)		
Future Time Orientation				-0.007	0.180	0.993
				(0.017)		
Financial Risk Tolerance				0.057	16.422**	1.058
				(0.014)		
Self-worth				0.269	7.016**	1.308
				(0.101)		
Financial Planning				0.004	0.148	1.004
				(0.011)		
Cash-flow 'Record-keeping'				0.067	7.456**	1.069
				(0.024)		
Cash-flow 'Budgeting'				0.024	2.145	1.024
				(0.016)		
Credit				-0.084	7.699**	0.920
				(0.030)		
Savings				0.305	3.995*	1.356
				(0.152)		
Risk				0.110	46.060**	1.117
				(0.016)		
Constant	-3.756	15.211	0.023	-6.877	21.050	0.001
	(0.963)			(1.499)		
-2Log Likelihood	1040.665			953.383		
Omnibus Test Coefficient	55.330**			160.612**		
Hosmer and Lemeshow Test χ^2	6.743,NS			10.184, NS		
Nagelkerke R^2	0.090			0.244		
Hit Ratio	62.0			65.8		

$^{+}$Residential areas (relative to rural), ethnicity (relative to Indian), homeownership (relative to no homeownership)
* $p \leq 0.05$; ** $p \leq 0.01$

in risky assets for Chinese families having high household income and with short tenure of working experience after controlling for other socioeconomic characteristics in the model. In Malaysia, it is generally known that Chinese are prevalent in investing especially in risky assets as compared to other main ethnicities. Hence, the results was representative of previous observations made regarding the Malaysian population.

Based on the expected logistic coefficient values, or the odd ratios, the household income of the family (exp (B) = 2.466) predicted the likelihood of a family to participate in risky assets as being 2.5 times more than predicting not to participate. Thus, families earning high household income had higher likelihood to participate in risky assets compared to families earning low household income. With higher household incomes, the potential risks associated with the risky assets would not create much financial problem as these high income earners have large source of money. Subsequently, these households with higher income will be financially prepared to face the risky situation and, thus, be able to maintain control over their financial matters even if the risk occurs. Previous studies have consistently shown the positive effect of income on financial well-being (Storesletten et al. 2004; Cocco et al. 2005) and supported the findings in this study on income. These researchers contended that as labour income was implicitly holding of safe assets, this positively influenced investment in risky financial assets. In the household portfolio, the investor has a mixture of safe assets and risky assets, whereby labour income will balance the risks from risky asset holdings.

In regards to ethnicity, a Chinese family (exp (B) = 1.751) was 2 times more likely to participate in risky assets than an Indian family. Being a Malay family, as compared to an Indian family, was not found to be significant in predicting participation in risky assets. The results also showed that a Chinese family had a higher probability of investing in risky assets compared to an Indian family. Thus, this reflected that a Chinese family was more tolerant towards the expected risks associated with risky assets as compared to an Indian family. This also explained the high participation of Chinese families in risky investments as found above. The result was similar to Gutter and Fontes's (2006) study that found differences among US ethnicities in regards to participation in risky assets, where white households were two times more likely to own risky assets than black households.

The respondent's working experience, on the other hand, predicted the probability of a family to participate in risky assets being only 3 percent (exp (B) = 0.968) less than predicting non-participation. A long tenure of working for the family financial manager would most probably result in a decreased likelihood to participate in risky assets by the family, with a small probability not to participate. With longer working experience, individuals will pay more attention to the high expected risk associated with risky assets, thus they would think deeply before participating in such assets. Longer working experience reflects the age of the family financial manager, possibly indicating older individuals approaching retirement age. Since they anticipate high expected risk, they would most probably be reluctant to invest in such assets as they have limited time to improve their financial situation in cases of unfavourable market condition. No comparison for working experience with past studies could be made.

Characteristics, such as the residential area of the family, being of Malay ethnicity, the education level of the family financial manager, home ownership and household size, however, were found to be not significant in predicting household participation in risky assets. Hence, these socioeconomic characteristics were not able to predict participation in risky assets by families. The non-significant effect of education on risky investments was not consistent with previous studies (Yamishita 2003; Rosen and Wu 2004; Christiansen et al. 2006; Cardak and Wilkins 2008). This inconsistent result with past studies may be due to a different culture of respondents and the fact that a larger portion of the respondents in this study have a low education levels.

The results obtained for the homeownership effect was also not in line with previous studies. A significant positive effect of homeownership on risky assets investments was found by Cardak and Wilkins (2008), where families owning a house tend to invest in risky assets. However, they argued that this was most probably being affected by the ease of obtaining low cost credit through mortgaging the house in purchasing the investment. The insignificant result in the influence of homeownership on risky investing found that Malaysian households differ from Australian households where mortgage-loans are involved.

To conclude, only Chinese ethnicity relative to Indian; respondent's working experience; and household income were able to predict investment in risky assets. Household income more strongly predicted the likelihood to invest in risky assets compared to Chinese ethnicity. The respondent's working experience, in contrast, predicted the likelihood of not investing in risky assets.

Referring to the results for Model 2 in Table 3, after including personality and behavioural factors to the binary logistic regression, the effect of Chinese ethnicity changed from significant to marginally significant. Financial risk tolerance and financial management practices factors, namely cash-flow, 'record-keeping', credit, savings, and risk, resulted in significant predictors. However, the negative effect of the future time orientation of the family financial manager was found to be insignificant in predicting investment in risky assets by families. Past studies on the effect of future time orientation were not found.

Financial risk tolerance was revealed to have significant and positive effects (B = 0.057; p = 0.0001) in predicting investment in risky assets. Families having a family financial manager possessing high financial risk

tolerance were found to be more likely to participate in risky assets. In contrast, families with risk-averse financial managers were unlikely to participate in risky assets. Self-worth was confirmed to be positively and highly significant (B = 0.269; p = 0.008) in predicting investment in risky assets. Families having a family financial manager with high self-worth were found to participate more in risky assets. The greater the self-worth of the family financial manager, the greater the likelihood of participation in risky assets.

The explanation for the results could be as follows. A future time-oriented family financial manager tends not to participate in risky assets, however the effect observed in this study was found to be insignificant. Nevertheless, the negative effect can be justified on the basis that future time-oriented financial managers prefer to benefit from the time value of money instead of facing the high expected risk from investing in risky assets. The longer investment period of a non-risky assets expecting low return would accumulate a high expected return. A similar accumulated expected return would be derived from safer investment in the long term as compared to the expected return from risky investment in the short term. As such, they are not keen to invest in risky assets as they can take advantage of large expected return from the longer period of investment in non-risky assets having low expected return. Though the effect of future time orientation is justifiable as explained above, this is not supported by this study or past studies.

In regards to financial risk tolerance, individuals with higher financial risk tolerance were expected to be more tolerant of financial risks and, thus, more likely to accept risks associated with risky assets. Hence, they would be most probable to participate in risky assets. Possessing low financial risk tolerance resulted in them not to be willingly accepting expected risk, leading to the probability of not participating in risky assets. This result was supported by past studies done by Guiso et al. (2001), Rosen and Wu (2004), Bailey and Kinerson (2005), Corter and Chen (2006), Jacobs-Lawson and Hershey (2005), Gutter and Fontes (2006) and Cardak and Wilkins (2008).

As for high self-worth individuals, they had high confidence in their ability to invest in risky assets. They perceived themselves as being able to overcome any challenges as compared to low self-worth individuals. The expected risk in risky assets seemed to be low and tolerable to them, thus they have high tendency to invest in risky investments. Low self-worth individuals tend not to invest in risky assets, as they perceived themselves as incapable to overcome the challenges from this type of investment. The result for self-worth, however, could not be compared with previous studies as no similar study was found.

Regarding financial management practices, those factors that significantly and positively predicted investment in risky assets by families were cash-flow 'record-keeping' (B = 0.067; p = 0.006), savings (B = 0.305; p = 0.046) and risk (B = 0.110; p = 0.0001). Families with good record-keeping, saved money regularly and engaged in extensive risk management were more likely to invest in risky assets as compared to those families that did not. In contrast, credit practice was found to be significant and negatively predicting investment in risky assets by families (B = -0.084; p = 0.006). Financial practices relating to credit undertaken by families was a discouraging factor in relation to investing in risky assets. Only financial planning and cash-flow 'budgeting' were not significantly predicting the probability to invest in risky assets or otherwise.

Contradictory findings from past studies were found for savings effect. Thus comparing the effect of saving practices with past studies both led to consistency and inconsistency with those studies. The findings relating to the effect of savings was consistent with results from Shum and Faig's (2006) study for savings intended for retirement, with a positive effect on equity share of portfolio. The portion invested in risky assets increased with this saving motive where retirement savings were most probably done by the families in the form of high return investment. To note, the savings in the current study also covered motives other than retirement. With financial security resulting from regular savings for various financial needs, such as for short-term and long-term goals; emergency and retirement, these families would be financially prepared to undertake the expected risks associated with risky assets.

As no relevant studies are available, comparisons with past studies for the effects of cash-flow 'record-keeping', risk practices and credit practices on risky assets holdings are not possible. Nevertheless, their significant effects on risky investing are explained as follows. The above result indicates that those participating in risky assets were found to be highly involved in cash-flow 'record-keeping'. The tendency to keep records updated by these investors may be due to the high potential of risks associated with the investments. The risky investors tend to pay their bills on time and have good record-keeping to keep track their investment performance. Furthermore, good record-keeping will enable them to be aware of and control their expenses, so as not to overspend. By doing so, they would be more prepared financially and psychologically.

As for risk practices, families involved in risk practices were found to be more likely to participate in risky assets. Engaging in this financial activity emerged as an activity that would predict more participation in risky assets for the families. Following that, holding insurance policies for various protections, including automobile insurance, home insurance, health and life insurance, helped to ensure long-term financial security. The sense of being financially secured, through the use of insurance policies, might be the main reason for them to participate in risky investments. Facing the risks if it

occurred would not have much impact on their future financial status or financial well-being.

Involving more in credit practices on the other hand, predicted less participation in risky assets. The credit practices included: listing of debt owed, keeping track of debt payment and repaying credit or loan on time. By having listed all debts owed, focusing on punctual debt repayment and ensuring that debts were repaid as scheduled, the family would realise the high financial commitment they have. In their effort to avoid incurring late charges or default payments, they would be unwilling to risk losing their money in risky investments. Hence, good credit practices by the family will allow them to foresee their low ability to invest in risky stocks. In conjunction to that, families highly involved in credit practices would predict less participation in risky assets of the families.

The strength of prediction for the significant predictors is determined by examining the values of expected B revealing financial risk tolerance (exp (B) = 1.058), predicting investment in risky assets almost six percent more as compared to predicting noninvestment in risky assets. Self-worth, however, showed a higher prediction of investment in risky assets with five times (exp (B) = 1.308) the strength of financial risk tolerance. The likelihood to invest in risky assets by high self-worth family financial manager was 31 percent more than it predicted noninvestment in risky assets. Family financial managers possessing high self-worth were thus found to hold more risky assets and lower self-worth family financial managers were found to hold less risky assets. This result however could not be compared with previous studies as no similar study was found.

In regards to financial management practices, the strength of prediction by record-keeping (exp (B) = 1.069) was higher than financial risk tolerance, while lower than self-worth. Record-keeping activities predicted investment in risky assets 6.9 percent as compared to predicting noninvestment in risky assets. The prediction strength by savings (exp (B) = 1.356) and risk practices (exp (B) = 1.117) were also higher than financial risk tolerance and self-worth. Savings predicted investment in risky assets of being 36 percent more likely than predicted noninvestment in risky assets and risk practices predicted investment in risky assets as being12 percent more likely than it predicted noninvestment in risky assets. For credit practice, a negative prediction (exp (B) = 0.920) on risky investing was revealed. Credit practice predicted investment in risky assets eight percent less than it predicting noninvestment in risky assets.

After controlling for socioeconomic characteristics, future time orientation, financial risk tolerance and self-worth influence in Model 2, credit practice was the only negative predictor among the financial management practices for investment in risky assets. Conversely, savings practice was ranked as the most influential predictor, followed by self-worth, risk practices, record-keeping and financial risk tolerance. Credit practice was the only negative predictor of investment in risky assets by families. This result suggests self-worth as a more important predictor than risk practices, record-keeping and financial risk tolerance.

The reason as to why savings served as the most influential predictor for risky investments would be the higher liquidity of savings as compared to purchasing insurance in risk management. Facing risks associated with investments requires families to be financially cushioned from financial disaster. Hence, savings constitute an important financial practice for risky investors. Updating the record-keeping regularly did not directly prepare them financially, however it indirectly affect available money as they keep track of their expenses and investment performance through record-keeping. By tracking their expenses and investment performance through record-keeping, they would be able to determine their financial situation and investment performance at certain points of time. Specific decisions can thus be made on whether to hold the investment or to sell the investment. If a high probability of risk is foreseen and could not be supported by the current or forecasted financial situation, the investment might be liquidated.

Among the positive predictors for risky asset holdings, financial risk tolerance was the least influential predictor compared to financial management practices factors. Thus, reflecting that financial practices, such as savings, record-keeping and risk practices, do exert a higher impact on risky investment when compared to the personality variable. The results indicate that these risky investors do behave in the manner suggested by experts in the financial management field, but the contributions of psychological variables contributing to the peace of mind was not ignored by the risky investors.

Self-worth, as another personality variable, showed greater impact on risky investing as compared to risk practices and record-keeping. Even though self-worth is a non-monetary predictor, it was found to contribute highly to the likelihood to invest in risky assets when compared to the other personality variables in the model. Self-worth also contributed more highly than the financial practices examined, with the exception of savings. Perceiving themselves as capable of doing things would most probably act as a motivating force for the family financial managers to venture into challenging tasks. Provided that financial security exists in the form of savings, such individuals are willing to accept the expected financial and psychological risks associated with risky assets. Hence, self-worth is justifiably an important factor, after savings, in the likelihood to participate in risky investments. In contrast, credit practices reflected financial commitment and low liquidity, as compared to the other financial practices and was the least likely to predict risky investing among significant predictors.

The results revealed that to participate in risky assets, a family should save more for short-term and long-term

financial needs, and purchase insurance policies to overcome various financial risks. Moreover, the high-self-worth and financial risk tolerance of the family financial manager tend to determine the likelihood to invest in risky assets. However, cash-flow activities, such as record-keeping, did not predict participation in risky assets. Involvement in credit practices by the family inversely predicted the probability of a family to invest in risky assets. Furthermore, financial planning and cash-flow of the family did not predict the probability of participating in risky assets.

CONCLUSION

The findings provided evidence that specific personality factors and financial management practices served as predictors in the investment in risky assets by families. This will assist financial planners to identify those families with potential to invest in this type of asset and encourage them to do so to gain more return from their investment. These families, on the other hand, would realise their capability in such investment. However, those who did not possess the above criteria, namely financially risk tolerance and high self-worth, could be trained to become such individuals to enhance their capability in risky investments. More families would then be investing in risky assets, thus more families would be financially stable in the long run. Concurrently, this will also contribute to the economic growth of the country. Assessing the risk tolerance of individuals has other significance for financial planners and financial service providers. Financial planners and financial service providers may be able to advise married investors whether certain types of portfolios are suitable according to the level of risk that the investor will tolerate. In view of that, an appropriate composition of assets in the portfolio may be purchased by investors accordingly to their risk tolerance.

Knowing the financial management practices performed by families having aggressive investors will enable financial educators, financial planners, and financial service providers to provide suitable advice to the investors to avoid negative effects on the financial well-being of the investors in cases of unfavourable market situation. Investors would be advised to perform specific financial practices to ensure minimum impact on their financial stability if the expected risks do arise. Specific products relating to savings could be offered to investors to cushion them from financial disaster. In terms of managing the investors' risk, insurance companies would have their role in advising investors to purchase suitable protection products to protect themselves against any significant effects associated with financial losses. New insurance policies may be developed tailored to the need of the investors. On the other hand, investors themselves would realise that the lack of specific financial practices, such as savings and risk management, in their daily lives may lead towards financial instability in certain situations. Due to that, investors lacking specific financial practices deemed important to their financial stability would prepare themselves with appropriate savings and risk practices or insurance products in view of the expected risks.

In this study, the contributions of future time orientation, financial risk tolerance, and financial management practices were considered in relation to investment decisions involving risky assets. To the knowledge of the researchers, future time orientation and financial management practices have not been tested regarding their ability in predicting investment decisions in general, particularly in the case of risky assets. The result of the study will contribute to the knowledge of the factors predicting investment decision in risky assets by families. This is expected to enhance the literature on investment decisions in the context of families and specific within Malaysian culture. Future studies on investment decisions could be performed regarding participation in risky assets based on the ratio of risky assets on the overall portfolio to determine any consistency with this study.

REFERENCES

Bailey, J. J. & Kinerson, C. 2005. Regret avoidance and risk tolerance. *Financial Counseling and Planning* 16(1): 23-28.

Bertaut, C. C. & Starr-McCluer, M. 2002. Household portfolios in the United States. In *Household portfolios*, edited by Guiso, L., Haliassos, M. and Jappelli, T. Cambridge: MIT Press.

Campbell, J. Y. 2006. Household finance. *Journal of Finance* 61: 1553-1604.

Cardak, B. A. & Wilkins, R. 2008.The determinants of household risky asset holdings: Australian evidence on background risk and other factors 10.1016/j.jbankfin.2008.09.021

Chiteji, N. S. & Stafford, F. P. 1999. Portfolio changes of parents and their children as young adults: asset accumulation by African-American families. *The American Economic Review* 89(2): 377-381.

Christiansen, C, Joensen, J. S. & Rangvid, J. 2006. Genders, marriage, and the decision to invest in stock and bonds: Do single women invest more in less risky assets?, D-CAFWorking paper No. 18, School of Economics and Management, University of Aarhus, Denmark.

Cocco, J., Gomes, F., & Maenhout, P. 2005. Consumption and portfolio choice over the life-cycle. *Review of Financial Studies* 18: 491-533.

Cooper, D. R. & Schindler, P. S. 2003. *Business Research Methods*. 8th edition. Singapore: McGraw Hill.

Corter, J. E. & Chen, Y. 2006. Do investment risk tolerance attitudes predict portfolio risk? *Journal of Business and Psychology* 20(3): 369-381.

Economic Planning Unit. 2006. *Ninth Malaysian plan 2006 - 2010*. Kuala Lumpur: Department of Prime Minister.

Feng, L. & Seasholes, M. S. 2007. Individual investors and gender similarities in an emerging stock market, *Pacific-Basin Finance Journal* Online version posted on 4 May 2007.

Garman. E. T. & Forgue, R. 2000. *Personal Finance*. 6th edition. Boston: Houghton Mifflin.

Grable, J. E. & Joo, S. 1999. Factors related to risk tolerance: A further examination. *Consumer Interests Annual* 41:1-8.

Graham, J. R., Harvey, C. R., & Huang, H. 2004. Investor competence, trading frequency, and home bias, Working paper, National Bureau of Economic Research. Guiso, L., Haliassos, M. and Jappelli, T. (2001). *Household portfolios*. Cambridge: MIT Press.

Guiso, L., Haliassos, M. & Jappelli, T. 2002. Introduction. In *Household Portfolios*, edited by Guiso, L., Haliassos, M. and Jappelli, T. Cambridge: MIT Press.

Guiso, L. & Jappelli, T. 2005. Awareness and stock market participation. *Review of Finance* 9: 537-567.

Gutter, M. S. & Fontes, A. 2006. Racial differences in risky asset ownership: A two-stage model of the investment decision-making process. *Financial Counseling and Planning* 17(2): 64-78.

Haliassos, M. 2006. *Household Portfolios*. Entry for New Palgrave Dictionary. 2nd edition.

Haliassos, M. & Bertaut, C. C. 1995. Why do so few hold stocks? *Economic Journal* 105: 1110-1129.

Haurin, D. R. & Morro-Jones, H. A. 2006. The impact of real estate market knowledge on tenure choice: A comparison of African-American and White households. *Housing Policy Debate* 17(4): 625-653.

Hershey, D. A. & Mowen. J. C. 2000. Psychological determinants of financial preparedness for retirement. *The Gerontologist* 40: 687-697.

Hira, T. K. & Mugenda, O. M. 1999. The relationships between self-worth and financial beliefs, behavior and satisfaction. *Journal of Family and Consumer Sciences* 91(4): 76-83.

Hochguertel, S. 2003. Precautionary motives and portfolio decisions. *Journal of Applied Econometrics* 18: 61-77.

Israel, G. D. 1992. Sampling the evidence of extension program impact. Program evaluation and organizational development, IFAS, University of Florida, PEOD-5, October.

Iwaisako, T. 2003. Household portfolios in Japan, Working paper No. 9647, National Bureau of Economic Research.

Jacobs-Lawson, J. M. 2003. Age differences in planning for retirement among working women. Doctoral dissertation completed at Oklahoma State University, Department of Psychology, Stillwater, OK.

Jacobs-Lawson, J. M. & Hershey, D. A. 2005. Influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviors. *Financial Services Review* 14: 331-344.

Jones, C. P. 2008. *Investment Analysis and Portfolio Management*. New York: John Wiley and Sons.

Population and Housing Census of Malaysia. 2001. *Population Distribution by Local Authority Areas and Mukim*. Putrajaya: Department of Statistics Malaysia.

Rosen, H. S. & Wu, S. 2004. Portfolio choice and health status. *Journal of Financial Economics* 72: 457-484.

Schooley, D. K. & Worden, D. D. 1999. Investors' asset allocations versus life-cycle funds. *Financial Analysts Journal* 5: 37-43.

Schubert, R. 2006. Analyzing and managing risk - on the importance of gender differences in risk attitudes. *Managerial Finance* 9: 706-715.

Shum, P. & Faig, M. 2006. What explains household stock holdings? *Journal of Banking and Finance* 30: 2579-2597.

Storesletten, K., Telmer, C. & Yaron, A. 2004. Cyclical dynamics in idiosyncratic labor market risk. *Journal of Political Economy* 112: 695-717.

Yamane, T. 1967. *Statistics: An Introductory Analysis*. 2nd edition. New York: Harper and Row

Yamishita, T. 2003. Owner-occupied housing and investment in stocks: An empirical test. *Journal of Urban Economics* 53: 220-237.

Husniyah Abdul Rahim*
Zuroni Md. Jusoh**
Universiti Putra Malaysia
MALAYSIA
husniyah@putra.upm.edu.my*
zuroni@putra.upm.edu.my**

M. Fazilah Abdul Samad (*the late)*
Universiti Malaya
MALAYSIA