

An empirical study of risk and risk reducing approaches

Hifza Mahmood Rana

Department of Management Sciences, Iqra University,
Islamabad, Pakistan

Affan Uddin Ahmed

Department of Management Sciences,
COMSATS Institute of Information Technology
Vehari, Pakistan

Saqib Murtaza

Department of Management Sciences, Iqra University,
Islamabad, Pakistan

Keywords

Risk perception, risk propensity, education, self-efficacy, wealth position, proportion in stocks, frequency of transactions.

Abstract

The aim of this research study is to develop a theoretical framework of risk and risk reducing approaches in order to understand the behavioral aspects of individuals in stock market. Model and hypotheses were formed and were tested through the utilization of survey instrument. Data was gathered from households; from each household, the individual who took most part in investment decisions is requested to take part in this study by giving their response. 812 questionnaires were finalized for analysis.

Self-efficacy, education level and wealth position of household was found to have negative influence on risk perception. Risk taking propensity was also negatively associated with risk perception of household. The part of financial assets invested in stock market tends to increase with the decrease in risk perception and risk perception positively associated with the frequency of transactions related to stock market. However, risk propensity assumed to have positive effect on part of invested financial assets but the results indicated negative relationship between these two constructs. Moreover, risk propensity was found to have no impact on frequency of transactions. A study in future will inspect the comprehensive perceptual procedures explaining the link among risk propensity and perceived risk in the investment framework.

1. Introduction

Various pragmatic research studies have been discovered that as per efficient market hypothesis (EMH), markets are not efficient due to some market abnormalities. So, the conventional finance theories do not tell about the importance of investor behavior towards decision making regarding investment. Researchers are now making use of behavioral approaches for understanding the market in order to learn about the lacking of conventional approach of finance. Thus, to consider it in the modern literature of finance, behavioral finance has become a key subject.

An important role in investor psyche is played by perceived risk, especially in decision-making in a risky situation. For studying importance of perceived risk, extensive research studies have been conducted for investigating perceived risk's role in diverse decision circumstances, including an assessment of a service (for example, Bansal and Voyer, 2000) or a

specific product/brand (for example, Erdem and Swait, 2004) to the acceptance/testing of innovative technologies or products (for example, Forsythe and She, 2003). The major subject in such research studies is related to steps taken by customers for minimizing or evading risk (usually termed as approaches for risk-reduction). Greater perceived risk, for example, is the reason for which customers do comprehensive search of information (Dowling and Staelin, 1994); to depend on a particular communication channel (for example, word-of-mouth or private sources) (Bansal and Voyer, 2000); or using further signals like brand name/repute, warranty, or price (Erdem and Swait, 2004). This study aims to add valuable findings in this line of research. Specifically, the role played by risk in an investor's employment of risk-reducing approaches from the perspective of stock investment decisions is examined in this study. Although balanced in its nature and importance to the above mentioned risk literature, this study aims to develop the present understanding in these manners.

First, two different aspects are included in perceived risk, that is, value of outcome and risk, so possibly involving two different types of behavioral answers for reducing risk (Cox, 1967; Taylor, 1974). Taylor (1974) argued that "Uncertainty regarding the consequence could be minimized by obtaining and managing information. Ambiguity regarding outcomes may be solved if the outcomes are minimized by minimizing the value at stake" (p. 54). Informal research studies, on the other hand show that consumers handle risk by making behavioral decisions which would decrease the influence of negative outcomes (like opting for the most inexpensive product, delaying an acquisition, or skipping a purchase). A comprehensive understanding of risk-reducing approach of consumers cannot be achieved in the absence of a simultaneous examination of both behavioral responses.

Second, the present studies on risk in consumer behavior overlooked risk propensity and are more focused towards perceived risk. Risk propensity must be included for connecting risk-reducing approaches and perceived risk, as it affects behavioral decisions facing risk and the perceived risk itself (for example, Forlani et al., 2002). Unpredictable empirical results in the association among risky behavior and risk perception (that is, greatly risky decisions even in greater risky circumstances) is mainly associated with the absence of risk propensity (Sitkin and Pablo, 1992).

Addressing these questions, we study a behavioral approach for minimizing perceived risk (that is, lowering the value of outcomes and lowering risk), while studying risk propensity as a different concept shaping these behaviors. Wealth and self-efficacy are also studied as two major risk antecedents. In all, a model is proposed which discovers the associations among the projected antecedents, two risk concepts, and their ensuing behavioral responses. With the help of this model, we examine alongside the relationship among perceived risk and risk propensity, and their influences on a type of risk-reducing approaches.

2. Theoretical Framework

The proposed theoretical model is depicted in Figure 1. It is proposed that risk perception is influenced by education level, wealth level and self-efficacy of an individual. Apart from these, risk perception is also influenced by individual's tendency to avoid or take risk i.e. risk propensity. Both risk perception and risk propensity affects individual's behavior aims to develop risk reducing approaches by managing importance and uncertainty of outcomes. The conceptual relationships among constructs are discussed below.

2.1 Risk perception

According to Cox (1967), a decision condition is uncertain if a decision maker is not sure regarding the outcome of an alternative. Libby and Fishburn (1977) argue that this condition

occurs if the probable consequences related to a decision differ hugely and also getting the preferred consequences is greatly influenced due to chance. A number of decision makers estimated and evaluated the intensity of this improbability (that is, perceived risk). The perceived risk is a prejudiced and predisposed assessment of the objective risk if an inbuilt uncertainty is seen as the objective risk. According to Dowling and Staelin (1994), perceived risk stimulates the decision maker to involve in a specific behavioral pattern.

In addition to uncertainty, an additional element is included in perceived risk i.e. the importance of outcomes (Cunningham, 1967; Taylor, 1974). According to Mitchell (1999), instead of a person's perceived exposure to the probable unfavorable outcomes, importance of outcomes is usually related to how destructive the probable monetary failures linked to a negative outcome are. A decision condition is termed as uncertain when individuals face huge losses because of a poor decision, particularly if this loss greatly influences their economic conditions.

Risk perception is described as a person's evaluation of how uncertain a condition is in terms of probabilistic calculations of the amount of conditional uncertainty, how handy that risky condition is, and assurance in those calculations (Baird & Thomas, 1985; Bettman, 1973). Even though it is recognized that risk perceptions are not clearly considered by prospect theory, Sitkin and Pablo (1992) argued that prospect theory results are in accordance with a negative association among making uncertain decisions and perceived risk. It means increased risk avoidance is there if risks to assets are significant (greater risk is perceived) compared to it is when a person perceives small risk since he has nothing to drop. It is also sensible to hypothesize that greater perceived conditional risk will be negatively linked with making uncertain choices as risk is more strongly related with negative consequences compared to outcome inconsistency (for example, Levitt & March, 1988).

The evaluation of perceived risk greatly relies upon an individual's conditional and behavioral aspects since perceived risk is one's prejudiced evaluation of an uncertain condition. Wealth position (Grable and Lytton, 1998) and self-efficacy (e.g., Krueger and Dickinson, 1994) are the variables which influence an individual's risk estimation most considerably. According to Bandura (1977), self-efficacy is defined as an individual's perception regarding how capable he is in managing and accomplishing acts essentially to control a likely condition. Self-efficacy is the biased evaluation of an individual's capability of doing necessary duties included in a decision making condition. Individuals having greater level of self-efficacy see themselves as being capable of examining, processing, and drawing true conclusions from partial or unclear data. So, self-efficacy may affect how individuals evaluate uncertainty level in a particular condition (Krueger and Dickinson, 1994). Individuals having greater self-efficacy assess a natural risk in an investment condition as not much unfamiliar, thus making a more risky choice among investment allocation choices (Dulebohn, 2002).

As self-efficacy forms the perceived level of risk through influencing an individual's evaluation of risk and the wealth position influences the outcome aspect of perceived risk. The importance of consequences for a person is determined by his wealth position (like domestic assets or income) since wealth position tells about his ability of understanding financial loss and also to recuperate from it; this ability describes a reference point through which unfavorable outcomes are assessed (Barsky et al., 1997). Persons having huge amount of wealth perceive a lower risk level linked to a particular investment compared to those with less wealth, thus showing a greater level of risk-taking behavior (Grable and Lytton, 1998). Therefore, we expect that a higher wealth position is the reason for a smaller degree of perceived risk for the stock market

According to Victor Vicciardi (2004), risk for an investor is the likelihood of losing a customer, whereas in the eye of customer, risk is the likelihood of losing his major investment, a part of it, or even a difference in income. It has been observed that the focus of earlier empirical literature was on the association among attitude towards risk, risk perception, and decision of investment by an investor; clearly investment decision chiefly relies upon risk attitude and risk perception. According to Nasic and Weber (2007), it is evident from behavioral finance studies that asset allocation decision in non-risky and risky assets depends upon the investor's risk-taking behavior.

The education level of investor hugely affects his behavior. It influences risk perception of investor. According to Grimes and Snively (1999), well-informed investors take large amount of risk however, less educated investors are more doubtful regarding their risk perception. Chen & Tsai (2010) argue that people with greater knowledge invest in risky asset that is; education level influences an investor's propensity to face risk. Therefore we hypothesize that;

H₁: *The higher level of self-efficacy regarding individual's own financial concerns decreases the level of perceived risk for stock market.*

H₂: *The higher level of wealth position decreases the level of perceived risk for stock market.*

H₃: *The higher level of education decreases the level of perceived risk for stock market.*

2.2 Risk Propensity

Risk propensity can be described as a person's existing inclination for taking or evading risks. It is considered as a person's characteristic which may alter with time and therefore is a growing asset of the individual who makes decision. This risk propensity's explanation follows Sitkin and Pablo (1992) and is linked to, although departs in a significant manner from earlier theories of propensity as a constant dispositional feature (for example, Fischhoff et al., 1981; Rowe, 1977). Interestingly, even opponents of risk propensity's projecting value (for example, MacCrimmon & Wehrung, 1990; Schoemaker, 1990) have used the established conceptualization of risk propensity as a constant personal characteristic.

In explaining risk propensity, two different approaches exist. Firstly, describe this construct as an individual characteristic meaning that it remains steady as time passes and in different situations (for example, Fischhoff et al., 1981). According to this viewpoint, risk propensity shows a person's general tendency for risk, risk-averse or risk prone.

Investors having risk-prone behavior are interested in taking risks with huge stakes and get satisfaction from it; they take pleasure in taking risk and become uncomfortable and impatient in even and definite circumstances. The opposite may be said for investors having risk-averse attitude. Risk propensity can be seen as behavioral propensity instead of a pure individual characteristic alternatively. As per this viewpoint, not only an individual's risk preference effects risk propensity but it is also affected by the decision of whether it is worth taking chances for enhancing the possibility of achieving good profits (Sitkin and Pablo, 1992). According to this viewpoint, although risk propensity is comparatively constant, it may vary by a decision situation and can be changed on the basis of acquaintance and understanding regarding the circumstance. A number of scientists have empirically proved that an investor's interest for taking risks changes relying on perceptual and related elements. Individuals were more interested in taking risks through resources of their organization instead of their own resources (MacCrimmon and Wehrung, 1990). In a particular circumstance, risk propensity is influenced by the results of prior tendency to avoid or take in alike circumstance (Taylor et al., 1996). In reality, there is little proof in the existing literature that risk propensity is common among circumstances (for example, Huff et al., 1997). In modern studies related to risk, risk

propensity concept prevails (Keil et al., 2000). Risk propensity is explained in this study as a behavioral leaning for avoiding or taking risk in investment choices.

Risk propensity is classified as a different concept influencing an investor's risk evaluation in terms of stock market. Particularly, greater tendency for taking risk is a reason for a lower level of perceived risk. It is explained in different studies that risk propensity of individuals affects the way in which they assess an uncertain condition. In evaluating a risky condition, an investor who is risk-averse is more expected to experience and consider negative consequences, therefore overrating the likelihood of loss compared to the likelihood of profit. Consequently, a risk-averse investor overvalues the degree of risk inbuilt in a decision condition (Sitkin and Pablo, 1992). The contrary point is made from the perspective of a risk-taking investor. A manager having lower propensity for risk assesses an innovative product idea as having more chances to flop, therefore perceiving a higher risk level while introducing a fresh product compared to a manager having high propensity for risk (Forlani et al., 2002). According to Keil et al. (2000), a manager having risk-taking tendency was expected to perceive a lower risk level compared to a manager having risk-averse tendency in commencing a risky project. We thus hypothesize that;

H₄: *Risk perception of individual for stock market decreases with the increase in risk taking propensity.*

2.3 Risk reducing approaches by reducing stakes

By decreasing the vulnerability attached to an unfavorable consequence or the value at stake, risk may be controlled. This act helps in lowering the influence of negative outcomes emerging from a decision. In this study, the important action in this manner is to decrease the amount of monetary assets spent in stock market. Managers with high risk perception level for the stock market would have a lesser part of their monetary assets spent in stocks. Short-term holdings (i.e., regular transactions) are also identified as one different behavioral reaction for controlling outcomes. Dorn and Huberman (2002) observed that investors putting their money in an uncertain, growing market have a tendency to have regular transactions. A high risk level with this sort of market will make it hard for people investing for enduring commitments. Also, managers having high risk perceptions are encouraged to expand investment times along with their portfolio. They acquire smaller segments at different times in spite of making fewer transactions with huge money. Thus, we hypothesize that;

H₅: *The higher the risk perception for stock market, the lesser the part of financial assets put in stock market.*

H₆: *The higher the risk perception for stock market, the more recurrent the transactions of stocks.*

Due to risk propensity, behavioral consequences related to risk also get affected. The value of an expected return is balanced due to high risk propensity, therefore resulting in risk-seeking behavior through enhancing the attachment to an uncertain condition. The share of assets in stock market would rise as risk propensity enhances, as this behavior can get more considerable profits. The transaction frequency can also get affected by risk propensity. Risk-taking managers demonstrate aggressive approaches of investment, dealing in more repeated turnovers of their portfolio compared to managers who are risk-averse (Fellner and Maciejovsky, 2002). The stock trading frequency enhanced due to a positive attitude for taking investment risk (Wood and Zaichkowsky, 2004). We hypothesize that;

H₇: *The invested proportion of financial assets in the stock market increases with the increase in risk taking propensity.*

H₈: *Stock transactions get more recurrent with the increase in risk taking propensity.*

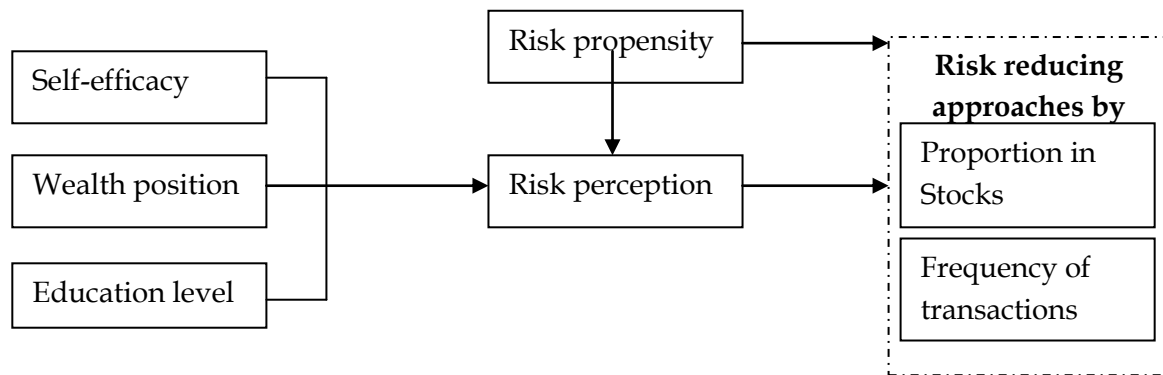


Figure 1: Theoretical framework of risk reducing approaches

3. Methodology

3.1 Measures

The risk reducing approach was measured by utilizing two constructs a) the total invested proportion of financial assets in stock market (computed by taking the ratio of money invested in stocks and mutual funds to money spend in all financial assets) and b) the total number of both individual stocks and mutual funds transactions made in last twelve months.

Survey instrument that is questionnaire was prepared to measure the constructs including self-efficacy, risk perception and risk propensity. Different questions were adopted from various studies as items in order to measure the above mentioned constructs. The responses for each item was evaluated on 5-point Likert scale from strongly disagree to strongly agree. The items were widely accepted by many surveys before; we examined the reliability and validity of the hypothesized constructs. The results of reliability and validity testing are discussed in detail in data analysis sections below.

The net worth of household was utilized to assess wealth position of individual. Net worth of individual is computed as the sum of total non-financial (including prime house and other commercial/ residential real estate) and financial assets minus the total individual's liabilities (including car and margin loans, mortgage and debt of credit card, etc.). The education level of household was measured by giving options ranging from Grade school (1-8) to University graduate or beyond.

3.2 Data collection

Data was gathered from households; from each household, the individual who took most part in investment decisions is requested to take part in this study by giving their response. Convenient sampling was used to get the responses from individuals. A total of 889 individuals met this standard to measure and therefore were included in this research study. A total of 812 questionnaires were included as these were completed in all respect. Approximately 96% households were male; almost half of the individuals aged 41 to 55; had net worth between Rs. 2500001 and Rs. 3500000; and almost 53% were university graduates. About 48% of households had invested in financial assets between Rs. 100000 and Rs. 300000 in the stock market, and made approximately 3.3 transactions of stock in last twelve months.

3.3 Data analysis

Exploratory Factor Analysis (EFA) was carried out to assess the reliability of items of survey instrument. Initially, 100 questionnaires were put in to EFA analysis to confirm the items. Table 1 shows the factor loadings of each item, each facto loading is more than 0.60 (Bagozzi and Yi, 1988). Sampling adequacy was measured by KMO which was 0.894, whereas suggested

minimum is 0.6. After the finalization of items, reliability analysis was conducted for these 100 questionnaires through Cronbach Alpha. The values of Cronbach Alpha are as follows; self-efficacy 0.834, risk perception 0.812 and risk propensity 0.840; whereas suggested minimum value is >0.7 (Hair et al., 1998).

Items	Mean	S.D	Factor loadings	Cronbach Alpha (composite reliabilities)
Self-efficacy				
SE1	2.51	0.76	0.88	0.834
SE2	3.01	0.79	0.81	
SE3	1.54	0.95	0.71	
SE4	2.97	0.79	0.69	
Risk Propensity				
RP1	2.64	0.85	0.68	0.840
RP2	1.72	0.94	0.84	
RP3	2.54	0.91	0.73	
RP4	2.83	0.83	0.69	
Risk Perception				
RPR1	2.09	0.72	0.82	0.812
RPR2	2.18	0.94	0.90	
RPR3	1.75	0.91	0.78	
RPR4	2.86	0.84	0.67	

Table 1: EFA analysis

All the items were finalized at EFA stage and no item was discarded during EFA analysis. Confirmatory factor analysis (CFA) was then performed for 812 questionnaires. The CFA is basically performed to evaluate whether the data adjusted with proposed structural model. No single item was taken out at this stage as none of the item was sharing higher degree of residual variance with other items (Asparouhov and Muthen, 2009). The absolute fit indices showed that model has good fit (GFI=0.901, NFI=0.948, CFI=0.985, AGFI=0.927, RMR=0.043 and RMSEA=0.052). Model is considered to be fit when value of GFI and CFI are greater than 0.90 and value of RMSEA is less than 0.08 (Gefen et al., 2000; Jaccard and Choi, 1996).

4. Results

Multiple regression analysis was performed to analyze the relationship between constructs. Firstly, the path analysis between risk perception and self-efficacy indicated significant and negative relationship ($\beta=-0.298$, $p<0.05$); supporting H₁. Wealth position of individuals also found to have negative effect on risk perception ($\beta=-0.369$, $p<0.05$), accepting H₂. The education level of household indicated negative and significant effect on risk perception ($\beta=-0.683$, $p<0.05$), supporting H₃. The relationship between risk propensity and risk perception is significantly and negatively associated ($\beta=-0.783$, $p<0.05$), supporting H₄.

Path	β	t-value	p-value
H ₁ : Self-efficacy → Risk perception	-0.298	3.689	0.000*
H ₂ : Wealth position → Risk perception	-0.369	7.452	0.001*
H ₃ : Education level → Risk perception	-0.683	8.151	0.000*
H ₄ : Risk propensity → Risk perception	-0.783	2.547	0.000*
H ₅ : Risk perception → Proportion in stocks	-0.189	15.421	0.002*
H ₆ : Risk perception → Frequency of transactions	0.624	4.812	0.001*
H ₇ : Risk propensity → Proportion in stocks	-0.248	3.689	0.000*
H ₈ : Risk propensity → Frequency of transactions	0.347	0.189	0.89

Table 2 Relationships in the model

* $p < 0.05$

Perceived level of risk found to have significant and negative effect on part of financial assets invested in the stock market ($\beta = -0.189$, $p < 0.05$), supporting H_5 . The results showed that increased risk perception enhance the frequency of transaction related to stock ($\beta = 0.624$, $p < 0.05$), supporting H_6 . Results signified that risk propensity had significant and negative effect on part of financial assets put in stock market ($\beta = -0.248$, $p < 0.05$), rejecting H_7 . Risk taking propensity found to have insignificant effect on frequency of transactions ($p > 0.05$), rejecting H_8 .

5. Discussion

First, the findings show that a negative relationship exists among perceived risk, wealth position, self-efficacy and education level. These results prove that perceived risk is shaped both by how investors view themselves being capable of managing risk also by how investors understand the effect of probable negative consequences (that is, having a different risk tolerance of the probable negative consequences). Dowling and Staelin (1994) argued that though a number of perceived-risk concepts include hidden wealth impacts in their assessments (for example, significance of loss factor of compositional assessments), only some investigators clearly shape this feature of a personal disposition. This variable is explicitly identified and it has been found that failure to understand a financial loss is really a crucial thing in modeling perceived risk. The contribution of this study is to enhance the role of education level that influences the level of perceived risk. It has been evident from the results that more educated households tend to perceive less about risk.

Risk propensity is one more major perceived risk determinant in addition to wealth position, education level and self-efficacy. Particularly, an investor having a greater tendency for risk-taking in his investment decisions sees less perceived risk linked to the stock market. The association among perceived risk and risk propensity is not considered in risk-related customer studies. This result emphasizes the significance of including risk propensity for the purpose of understanding perceived risk. As maintaining the association among risk propensity and perceived risk, but, the information is not enough for validating the cognitive methods suggested for this association in earlier research studies. A study in future will inspect the comprehensive perceptual procedures explaining the link among risk propensity and perceived risk in the investment framework.

It is concluded from the findings that in a high perceived risk situation, investors tend to make behavioral decisions that would reduce their susceptibility to likely negative consequences. Particularly, investors having greater perceived risk for the stock market have considerably lesser amounts of their monetary assets spent in stocks. It is also found that greater risk propensity guides investment choices in a manner to support more risky decisions. Particularly, investors having greater risk propensity allot lesser amounts of their monetary assets to more risky investments. It is also obvious from the findings that regular stock transactions happen due to greater perceived risk instead of greater risk propensity; it is a behavioral reaction for handling greater perceived risk (that is, risk-reducing approach) in spite of an effort to take risk for getting improved outcomes. According to Kennon (2005), making investment with an amount of money at diverse periods of time is usually recommended as a strategy for handling the risk linked with greater market variations, though it might not help in getting greatest probable outcome.

6. Conclusion and Limitations

Firstly, findings must be comprehensive keeping in mind the actual context. The suggested model focuses on risk and approaches of risk-reduction for investors' investment

choices. The results would be best employed to investor behavior in alike situation. Secondly, the evaluation items can be enhanced. In fact, researchers have observed the absence of a risk measure suitably showing the particular framework of a decision scenario. Primary research carried out for making or verifying risk evaluators in monetary issues is promoted, as it would aid public, business, and academic policy-makers define an improved image of risk-related investor behavior from the perspective of monetary services/products. Thirdly, this research study is static by design in a way that its focus is not on the variations in an investor's choices and views that are resultant prior actions. For example, people can change their approaches because of prior behavioral decisions. A study in future can follow how investors' risk perception and risk propensity have altered with time as their situational and behavioral factors alter. Fourthly, only educational level is taken as a demographic variable which influence risk perception. In future, other demographic variables including gender and age would also be analyzed.

References

- Asparouhov, T. and Muthén, B. (2009). "Exploratory structural equation modeling", *Structural Equation Modeling*, 16, 397-438
- Bagozzi, R. P., and Yi, Y. (1988). "On the evaluation of structural equation models". *J Acad Mark Sci*, 16, 74 - 94.
- Baird, I. S., and Thomas, H. (1985). "Toward a contingency model of strategic risk taking", *Academy of Management Review*, 10, 230-243.
- Bandura, A. (1977). "Towards a unifying theory of behavior change", *Psychol Rev*, 84, 1999-2150.
- Bansal, H. S., and Voyer, P. A. (2000). "World-of-mouth processes within a services purchase decision context", *J Serv Res*, 3(2), 166 -78.
- Barsky, R. B., Juster, F.T., Kimball, M. S., and Shapiro, M.D. (1997). "Preference parameters and behavioral heterogeneity: an experimental approach in the health and retirement study", *Q J Econ*, 112(2), 537-79.
- Bettman, J. R. (1973). "Perceived risk and its components: A model and empirical test", *Journal of Market Research*, 10, 184-190.
- Chen, S. & Tsai, C. (2010). "Investment Preference, Risk Perception, and Portfolio Choices under Different Socio-Economic Status Department of Finance", Nan Hua University, Chiayi, Taiwan.
- Cox, D. F. (1967). "Risk taking and information handling in consumer behavior", Cambridge, MA' Harvard University Press.
- Cunningham, S. M. (1967). "The major dimensions of perceived risk. In: Cox DF, editor. Risk taking and information handling in consumer behavior", Cambridge, MA' Harvard University Press.
- Dorn, D., and Huberman, G. (2002) "Who trades?", Columbia University Working Paper.
- Dowling, G. R., and Staelin, R. (1994). "A model of perceived risk and intended risk handling activity", *J Consum Res*, 21, 119- 34.
- Dulebohn, J. H. (2002). "An investigation of the determinants of investment risk behavior in employer-sponsored retirement plans", *J Manage*, 28(1), 3-26.
- Erdem, T., and Swait, J. (2004). "Brand credibility, brand consideration, and choice", *J Consum Res*, 31(1), 191-9.
- Fellner, G., and Maciejovsky, B. (2002). "Risk attitude and market behavior: evidence from experimental asset markets", Max Planck Institute for Research into Economic Systems, Papers on Strategic Interaction, 34-2002.

- Fischhoff, B., Lichtenstein, S., Slovic, P., Derby, S. L., and Keeney, R. L. (1981). "Acceptable risk", New York, NY' Cambridge University Press.
- Forlani, D., Mullins, J., and Walker, O. C. (2002). "New product decision making: how chance and size of loss influence what marketing managers see and do", *Psychol Mark*, 19(11), 957-81.
- Forsythe, S. M., and She. B. (2003). "Consumer patronage and risk perceptions in Internet shopping", *J Bus Res*, 56(11), 867- 80.
- Gefen, David., Straub, D., and Boudreau., M. (2000). "Structural equation modeling and regression: Guidelines for research practice", *Communication of AIS*, 4 (7).
- Grable, J. E., and Lytton, R. H. (1998). "Investor risk tolerance: testing the efficacy of demographics as differentiating and classifying factors", *Financ Couns Plan*, 9(1), 61- 73.
- Grimes, D. A. and Snively, G. R. (1999). "Patients' Understanding of Medical Risks: Implications for Genetic Counseling", *Obstetrics and Gynecology*, 93, 910-914.
- Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. (1998). "Multivariate Data Analysis", fifth edition, Prentice-Hall International, Inc.
- Huff, R. A., Keil, M., Kappelman, L., and Prybutok, V. (1997). "Validation of the Sitkin-Weingard business risk propensity scale", *Manage Res News*, 20(12), 39- 49.
- Jaccard, J. Wan., and Choi, L. (1996) "LISREL approaches to interaction effects in multiple regression", Thousand Oaks, CA' Sage Publications.
- Keil, M., Tan, B. C., Wei, K., and Wassenaar, T. (2000). "A cross-cultural study on escalation of commitment behavior in software project", *MIS Q*, 24(2), 299- 325.
- Kennon, J. (2005). "Dollar cost averaging". About.com. Accessed from <http://www.beginnersinvest.about.com/cs/newinvestors/a/041901a.htm>.
- Krueger, N., and Dickinson, P. R. (1994). "How believing in ourselves increases risk taking", *Decis Sci*, 25(3), 385 -400.
- Levitt, B., and March, J. G. (1988). "Organizational learning", In W. R. Scott & J. Blake (Eds.), *Annual review of sociology*, 14, 319-340. Palo Alto, CA: Annual Reviews.
- Libby, R., and Fishburn, P. C. (1977). "Behavioral models of risk taking in business decisions: a survey and evaluation", *J Acc Res*, 15(2), 272.
- MacCrimmon, K. R., & Wehrung, D. A. (1990). "Characteristics of risk taking executives", *Management Science*, 36, 422-435.
- Mitchell, V. (1999). "Consumer perceived risk: conceptualizations and models", *Eur J Mark*, 33, 163- 95.
- Nosic, A. and Weber, M. (2007). "How Risky Do I Invest: The Role of Risk Attitudes, Risk Perceptions and Overcon_dence", Working Paper.
- Rowe, W. D. (1977). "An anatomy of risk", New York: Wiley.
- Schoemaker, P. (1990). "Are risk attitudes related across domains and response modes?", *Management Science*, 36, 1451-1463.
- Sitkin, S. B., and Pablo, A. L. (1992). "Reconceptualizing the determinants of risk behavior", *Acad Manage Rev*, 17, 9- 38.
- Taylor, J. W. (1974). "The role of risk in consumer behavior", *J Mark*, 38, 54 - 60.
- Taylor, L. A., Hall, P. D., Cosier, R. A., and Goodwin, V. L. (1996). "Outcome feedback effects on risk propensity in an MCPLP task", *J Manage*, 22(2), 299- 322.
- Wood. R., and Zaichkowsky, J. L. (2004) "Attitudes and trading behavior of stock market investors", *J Behav Finance*, 5(3), 170- 9.