RISK TOLERANCE AND INVESTMENT DECISIONS AMONG CREDIT BENEFICIARIES

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ABSTRACT

Risk attitude and risk perceptions are two crucial factors that could influence an individual's investment decisions. In developing countries like Pakistan, the whole society experiences different risks; however, financial risk is an essential factor affecting investors' decisions. This study used a dataset of 120 respondents collected through face-to-face interviews from two districts of Punjab province. A logit model is used to assess the impact of various socio-economic and behavioral factors on respondents' decisions to invest the borrowed money in enterprises. The findings revealed that investment in low-risk enterprises and diversification of income were the two main strategies adopted by the survey respondents. The results further revealed that health risk perception has positive while risk tolerance has a negative influence on the decision to invest in low-risk enterprises to mitigate the adverse consequences of risks. The findings also revealed that education and the adoption of diversification of income sources are positively correlated, while the perception of non-repayment and coefficient of location are negatively correlated with the adoption of diversification of income sources. Additionally, the study recommends that the Government should make sustainable and investor-friendly credit policies and educate the general public on how to use credit efficiently.

INTRODUCTION

While making important decisions about investments, risk tolerance plays a key role. In the risk situation, investors may make a mistake in making important decisions regarding their business (Bashir et al., 2014). Risk tolerance directly impacts investors' investment decisions and evaluates the key factors of various assets in the portfolio (Cordell, 2002). Financial risk tolerance can be described as an individual's desire to take a financial risk. The personal management of finance has determined the whole society's success because the society is made of individuals. There is a greater probability that individual investors will have more issues. Investors having a large-scale investment have many assets to get important and critical knowledge about their investment goals. It is hard for small-scale investors to process information. That's why individual investors fail to make wise in large organizations (Chen, 2011). Decision-making factors, i.e., market and information structures, systematically influence personal investment decisions (Mehta and Chaudhari, 2016).

While investing, the investors are interested in maximizing their income and minimizing their expenditures. Individuals pursuing their benefits behave rationally, save some of their income for expenditure, and invest their savings into an enterprise. These investment decisions, however, are not straightforward and simple. In the investment process, the probability of profit and loss makes decision-making difficult for individuals as the investor can use his/her savings proficiently (Islamoğlu et al., 2015). In addition to the probabilities of profit and loss, numerous other

factors affect the investment decisions such as salient market features, the risk profiles of individuals and disclosed accounting information (Jagongo and Mutswenje, 2014; Kannadhasan, 2015). Individual investors mostly get information from media and the current situation in the market, on the other hand, professional investors can collect information from technical analysis and authentic means (Dimitrios et al., 2007). Risk tolerance can remain in different forms because it usually discusses the fears that are unfavorable or flaws in the well-being of the households. The risk-taking persons can easily work in a risky environment (Shaw, 1996) and would like to invest in riskier enterprises with higher returns (Pak and Mahmond, 2015; Kannadhasan, 2015). The risk-averse individuals, however, are caught in a dilemma of choosing an event with higher returns but with a fair degree of risk involved against an event with lower but sure returns.

This research is planned to determine the impacts of potential factors, including the socio-economic attributes of the sampled respondents and their risk tolerance on their financial decisions. The demographic factors influencing the financial decisions of respondents include gender, age, occupation, and individual financial risk tolerance. Risk tolerance is a critical factor that actually affects a different financial decision (Chavali and Mohanraj, 2016). Risk tolerance is termed as an individual's likelihood or ability to get engage in a financial activity which is not certain (Fehr-Duda et al., 2010).

Various researchers demonstrated that the investors with high-risk tolerance got more habituated to an investment associated

with more risk (Pak and Mahmond, 2015; Kannadhasan, 2015). Opposite to the risk disinclined, these are investors who deny taking or moving up with the threat. In fact, in simpler words, it can be mentioned that the range of risk tolerance of the risk disinclined is lower than that of risk takers. The personality of risk takers will be more belligerent, great audacious in investment, whereby in comparison to risk taker, the nature of risk disinclined is much less belligerent and audacious (Mishra &Lalumiere, 2011). In general, each investor has his level of risk tolerance depending on various key factors. According to previous researchers, some demographics can significantly affect the risk of toleration. They found relationships between risk toleration and gender. Thus, women should be more risk disinclined than men (Bajtelsmit and Bernasek, 1996). Then furthermore, the individuals with great education are generally considered as more risk tolerant (Haliassos and Bertaut, 1995,). The significant amount of literature is available on the relationship of risk tolerance and socio-economic attributes on one hand and investment decisions on other hand, however, there is a lack of literature on the role of risk attitude, risk perceptions and socio-economic characteristics on individuals' decision of investing the borrowed money. This study is specifically designed to seek answers to the basic research questions of what is the role of behavioral factors including risk attitude and risk perceptions and individuals' decision regarding investing borrowed money and how socio-economic attributes shape individuals' decisions of investing loaned money in an enterprise?

METHODOLOGY

Sampling and Data Collection

This study was conducted in two districts of Punjab province namely Faisalabad and Rahimyar Khan. The primary data for the current study is collected between January and April 2023. A total of 120 sample respondents mostly household heads were selected to explore the study objectives. This study has adopted a multiple stage sampling technique. In the first stage of sampling process, the researchers selected the Punjab province purposively as the main study area due to the fact that Punjab is the most populated province of Pakistan. In the second stage of sampling, the researchers selected two districts randomly out of 36 districts. In the third and final stage of sampling procedure, a total of 120 sample respondents were randomly selected (60 from each district) using a list of the total number of borrowers shared by the relevant Banks authority in the study area.

All the interviews for the current study were conducted in the context of shared research principles and ethics (Shah et al., 2018). Formal consent was asked before initiating the field survey and the study objectives, purpose, and data usage were properly explained before the start of interviews. The respondents who showed concerns about participating in the field survey were substituted with other respondents.

Empirical Modeling

Descriptive statistics were used, including frequency distribution, percentages, averages and standard deviations. The logit model was also employed to assess the impact of various socio-economic and behavioral factors on respondents' decisions to invest the borrowed money in various enterprises.

Assessing the Impacts of Various Factors on the Adoption of Risk Management Strategies

Logit model is a useful analysis model especially for determining the relationship between variables in such a way when dependent

variable is binary and the independent variables are nominal, ordinal, interval or ratio-level. Our research uses investment in low-risk enterprises and diversification of income sources as dependent variables. By following this model, we determined the impacts of socio-economic attributes, investor's risk perceptions and attitude on their decisions to accept risk management strategies to mitigate the adverse consequence of risk.

We can describe the model as follows;

$$\text{LogitY}[P/1-P] = \beta_0 + \beta_i X_i + e_i \qquad (1)$$

Where Y is a binary dependent variable (1 denotes if the individual has adopted the specific investment strategy and 0 otherwise). β_i denotes the coefficient vector (to be estimated), β_0 is constant, while X_i signifies independent variables. The present study considered 2 most prominent investment strategies namely, investment in low risk enterprises and diversification of income sources in response to mitigate the adverse consequence of risk and estimated the logit model for each strategy.

Odd ratios

Odds ratio (OR), relative to different events, describes the relative measure of relationship between two odds (Szumilas, 2010). The odds of A happening relative to B for two events (A and B) can be drawn as follows:

$$\text{Odds } \{A \text{ vs } B\} = \text{odds } \{A\}/\text{odds } \{b\} = P_A/(1-P_A)/P_B/((1-P_B) \quad (2)$$

Dependent Variables

The two most dominate investment strategies under uncertain circumstances namely, investment in low-risk enterprises and diversification of income sources adopted by borrowers in the study area considered to be the dependent variables. The dependent variables are dichotomous in nature and have value 1 if individual adopted the specific strategy and 0, otherwise

Independent Variables

Individual investors Attributes: The age, education and income were measured in years, schooling year and rupees per month, respectively.

Behavioral factors: The perceptions regarding the occurrence and severity of risk sources of the respondents were recorded on following five-Likert scale. Risk matrix is provided in the Figure 1.

Figure 1. Risk Matrix.

Risk Attitude was derived from the toss method, where respondents were asked to choose an option with equal probabilities payoff amounts, these options were;
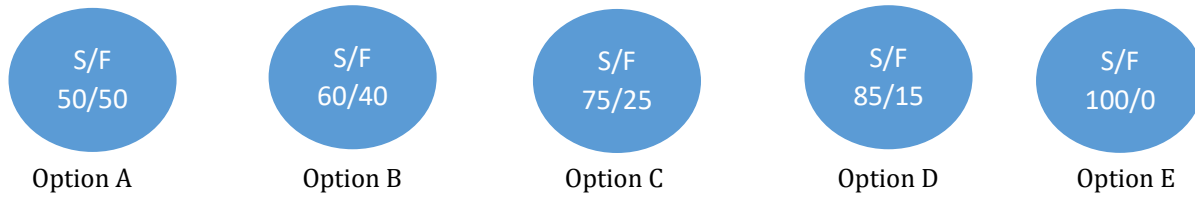
Figure 2. Elicitation of Risk Attitude.

Respondents choosing option A are considered to be highly risk averse while B are considered to be moderately risk averse similarly, C are considered to be risk neutral likewise, D are considered to be moderately risk seekers and E are considered to be higher risk seekers.

Location: A dummy variable for location is also added to know the location differences in adoption of risk management strategies. Respondents from Faisalabad were assigned a value of 1 while 0 was assigned to respondents from Rahimyar Khan.

RESULTS AND DISCUSSION
This section highlights the study's main findings of investors who borrow money from commercial banks and other sources of finance. The section is divided into two main parts. The first part indicates the descriptive statistics of the investors' characteristics and the second part depicts the logit model's empirical estimation.

The mean value of an investment in low risk enterprise indicates that in our sample 37.5 percent of the sampled respondents were using this strategy while investing the borrowed money from financial institutions while 27.5 percent of the sampled respondents opt diversification of income sources when it comes to investment of the borrowed money. Most of the sampled respondents were concerned about non-repayment of the borrowed money in time (0.49), followed by respondents with major concern of loss in business (0.48). The mean value of risk attitude indicates that most respondents are between risk-averse and risk-neutral attitudes.

Parameter estimates of the Logit Model
The determinants of respondents' decision to adopt the two dominant risk management strategies for minimizing risk while investing the borrowed money in an enterprise are provided in Table 2.

Table 1. Variables' descriptive statistics.

Variables	Mean	Std. Dev.	Max	Min
Investment in Low Risk enterprise	0.375	0.48615	1	0
Diversification of income sources	0.275	0.4484	1	0
Age	44.075	9.8511	75	27
Education	9.983	4.40203	18	0
Income	44825	31647.13	300000	15000
Perception of non-repayment of loan	0.49167	0.50202	1	0
Perception of loss in business	0.48333	0.50182	1	0
Perception of health loss	0.3167	0.46713	1	0
Risk Attitude	2.79166	1.3956	5	1
Location	0.5	0.5021	1	0

Source: Authors' calculations from survey data.

Table 2. Parameters estimate of the logit model.

Variables	Investment in Low Risk Enterprise		Diversification of income sources	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Age	0.003	0.259	0.147	0.024
Education	0.071	0.064	0.110*	0.064
Income	-0.00001	0.000009	0.000009	0.000007
Perception non-repayment	0.321	0.459	-1.041**	0.484
Perception Loss	-0.261	0.459	0.592	0.474
Perception Health	1.862***	0.553	-0.484	0.528
Risk Attitude	-0.711***	0.174	-0.021	0.166
Location	-0.004	0.489	-1.273***	0.495
Constant	0.946	1.667	-2.065	1.6299
Log Likelihood	-65.266		-62.848	
LR Chi² (8)	35.79***		22.57***	
Pseudo R²	0.2152		0.1522	

Investment in Low-Risk Enterprises
The data of the logit model is given in Table 2. The empirically estimated coefficient indicates the positive relationship between age and the adoption of low-risk enterprises to minimize various risks in an enterprise. The key cause behind this could be the fact that older people are likely to invest in low-risk enterprise compared with the young individuals to minimize or lessen the adverse impacts of different risks sources.

Education is a crucial factor in enhancing one's ability to bring more awareness and knowledge to deal with different kinds of risks sources. The coefficient of education and adoption of low-risk enterprise has a positive and non-significant relationship. This could be because respondents with more education have more chances to adopt low-risk enterprise to moderate the harmful impacts of risks on enterprises. The results further revealed that more educated individual investors are more likely to adopt low-risk enterprises to lessen the adverse effect of risks on enterprise.

Economic status is an important attribute of an individual or household adaptive capacity to deal with different risks sources. The coefficient of income in Table 2 shows a significant relationship with the adoption of low-risk enterprise to minimize the negative consequences of risks. However, this relationship is negatively associated as the income level of the respondents increases, there are less chances of the household head to adopt low risk enterprise to minimize the adverse consequences of risks. Similarly, the coefficient of perception of non-repayment in Table 2 has a positive but non-significant relationship with the adoption of low risk enterprise to mitigate the adverse consequences of risks. The logic of this could be the fact that when the household head's perception of non-repayment increases, there are more chances of an individual to adopt low risk enterprise to minimize the adverse impact increases.

The coefficient of perception of losses in business has a negative and non-significant impact on the adoption of low risk enterprise to mitigate the adverse effect of risks on an enterprise. The findings further illustrates that household head perception of loss in a business increase there are less chances to choose investing in low risk enterprise. The reason could be due to the fact that majority of the sample respondents were highly motivated to invest in different businesses to diversify their livelihoods which made them more pro active to invest in order to prevent their investment and get maximum benefits.

Perception of health has positive as well as highly significant impact on adoption of low risk enterprise to mitigate the adverse consequences of risks. Above outcomes illustrate that when an individual's health increases, there are more chances to invest in low-risk enterprise to minimize the various risks in an enterprise. The main reason could be that respondents with good healthy lives bring more clarity in ideas, innovation, and better understanding of risk sources. This encourages him always to foresee the risk and invest in such enterprise which is more risk free.

The empirically estimated coefficient indicates that attitude has a negative and highly significant impact on adopting low-risk enterprise to minimize various risks in an enterprise. The findings illustrate that the attitude of older individuals are less likely to choose investing in low risk enterprises in order to minimize the adverse consequences of risks as compared with the middle age and young people. This could be due to the fact that young people are highly motivated and positive that's why their attitude towards risk associated with different enterprises is more settled way of thinking or feeling about low risk enterprise adoption.

The empirical findings in Table depict that the coefficient of location has insignificant impact on adoption of low risk enterprises indicating that the adoption of low risk enterprise to cope with the risks is similar in both districts.

Determinant of Income Diversification of Income Sources
The empirically estimated coefficient indicates that age has a positive but insignificant impact on adopting diversification of income sources to minimize various risks associated with enterprises. The main reason could be that older people are more likely to choose diversification of income sources as they have experience and skills to utilize their energies and knowledge better than their younger counterparts. In addition to this older people have more patience and in depth thinking once they diversify their income sources because they are responsible for the maintenance of equilibrium within a family. If they are financially strong and have diversified income sources, this will make them more resistant to deal with future challenges in the shape of natural disasters and other risks sources. Our results are in-line with the findings of Rehima et al. (2013) and Deressa et al. (2010) and are opposite with Mesfin et al. (2011) and Ashfaq et al. (2008).

According to Table 2, the coefficient of education and adoption of diversification of income sources are positively corelated. This implies that education brings awareness, skills and critical thinking to deal with different risk sources as respondents with more education have a higher probability likely to adopt diversification of income sources to minimize various types of risks compared with the less educated or illiterate people. The results of this study are similar to the findings of Ullah et al. (2015) and contradictory to the findings of Mesfin et al. (2011) and Rehima et al. (2013).

The coefficient of income is positively associated with the diversification of income sources as illustrated in Table 2. The findings in Table 2 further revealed that when the income level of the sample respondent increases there are more chances to adopt diversification of income sources to minimize different types of risks. The results of this study are in agreement with the findings of Ullah et al. (2015) who also found positive relationship of income with diversification of income sources.

The findings regarding the perception of non-repayment in Table 2 has a significant negative impact on the adoption of diversification of income sources, indicating that respondents perceiving non-repayment of the borrowed money as a potential risk will tend to avoid the adoption of diversification. The coefficient of respondent's perception of loss in business has a positive but non-significant impact on adoption of diversification of income sources to minimize various types of risks. This implies that respondents who experienced losses in their business in the past years were more worried because loss in businesses badly damaged their livelihoods and other sources of income and spent all their savings in recovering from such shocks. Hence the respondents have more chances to adopt diversification of income sources.

Findings also described in Table 2 that perception of health has negative and insignificant impact on adoption of diversification of income sources. The results in Table 2 further illustrates that when perception of health of an individual increase there are less chances to adopt diversification of income sources to minimize various risks due to the fact that diversified income sources increases the financial conditions (savings) and respondents can spend a handsome amount of their savings on health issues experienced by themselves or families.

Table 3. Odds ratio of the Logistic Model.

Variables	Low Risk		Diversification of income sources	
	Odds ratio	Std. Err.	Odds ratio	Std. Err.
Age	1.003	0.026	1.015	0.024
Education	1.074	0.069	1.117*	0.072
Income	0.999	8.97e-06	1.000	7.45e-06
Perception non-repayment	1.378	0.633	0.353**	0.171
Perception Loss	0.771	0.354	1.808	0.858
Perception Health	6.436***	3.556	0.616	0.325
Risk Attitude	0.491***	0.086	0.979	0.162
Location	0.996	0.487	0.279***	0.139
Constant	2.574	4.291	0.127	0.208
Log Likelihood	-65.266		-62.848	
LR Chi^2 (8)	35.79***		22.57***	
Pseudo R^2	0.2152		0.1522	

Similarly, the risk attitude of respondents are less likely to minimize various risks as the empirically estimated coefficient of attitude in Table 2 has a negative and insignificant impact on the adoption of diversification. Our results are in disagreement with the findings of Kouame (2010).

According to the findings in Table 2 that the coefficient of location in the study region has negative but highly significant impact on adoption of diversification of income sources to manage various type of risks, indicating that the adoption of diversification as a risk coping strategy is more common among respondents belonging to Faisalabad District.

Regarding calculating the odds ratios, we have assumed that all other variables are kept constant at their mean value. The odds ratio calculated after logit model indicates that one-unit increase in age will increase the chances of adoption of investment of borrowed money in low risk enterprise by 1.003 times. Similarly, with respect to education, the odds ratio depicts that a one-unit increase in education will increase the odds of adopting investment of borrowed money low risk enterprise by 1.074 times. The odds ratio estimated after the logit model are presented in Table 3. The odds ratio indicate that one-unit increase in income will increase the chances of adoption of investment in low risk enterprise by 0.999 times.

Findings of odds ratio indicate that one-unit increase in perception of non-repayment of credit will increase the chances of adoption of investment in low risk enterprise by 1.378 times. In Table 3 estimated odds ratio indicate that one-unit increase in independent variable namely perception of losses in business then there are more chances to adopt investment in low risks enterprise by 6.4363 times. Table 3 highlights the odds ratio estimated after logit model indicate that one-unit increase in endogenous variable which is perception of health the chances to adopt the strategies of investment in low risk enterprise reduced by 0.491 times. Findings of odds ratio highlights that with a one unit increase in risk attitude of the sampled respondents the chances to adopt investment in low risks enterprise decreased by 0.491 times.

Table 3 highlights the odds ratio calculated after logit model indicate that if the respondent belong to Faisalabad district the chances of adoption of investment in low risk enterprise decrease by 0.996 times. The odds ratio associated with age highlights that an increase in respondents' age by one year increases the chances of adopting diversification of income sources by 1.015 times. Similarly, the odds ratio associated with education represents that

a one unit increase in education will increase the odds of adopting diversification of income sources by 1.117 times. The odds ratio of income indicates that one unit increase in income will increase the chances of adopting diversification of income sources by 1.000 times. Similarly, the odds ratio indicate that one unit increase in perception of non-repayment of credit will decrease the chances of adoption of diversification of income sources by 0.353 times.

Table 3 points that an increase in the estimated odds ratio of perception of losses in business will increase the chances of adoption of diversification of income sources by 1.808 times. Similarly, a one-unit increase in the perception of health loss will decrease the chances of adopting diversification of income sources by 0.616 times. As per the findings, the chances of adopting diversification of income sources will decrease by 0.979 times for a more risk seeking individual compared to a risk averse individual while the odds ratio associated with location indicates that the chances of adopting diversification of income sources as a risk management strategy will decrease by 0.279 times if a respondent is from District Faisalabad compared to Rahim Yar Khan.

CONCLUSIONS

The study attempts to highlight the role of socio-economic and behavioral factors' role in individual decision-making processes regarding adopting risk-mitigating measures while investing borrowed money in an enterprise. The study used two individual logit models on data collected from randomly selected sampled respondents from Faisalabad and Rahimyar Khan Districts. Two dominant risk management strategies, namely, investment in low-risk enterprises and diversification of income sources, were used as dependent variables in the logit models. The empirical results demonstrate that health perceptions and risk attitudes significantly impact individuals' decisions to invest in low-risk enterprises. In case of diversifying income sources, education, perceptions of non-repayment of loan, and location dummy (Faisalabad) were significant factors shaping an individual's decision to use income diversification strategies to mitigate investment risk.

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