E-ISSN: 2706-8927
P-ISSN: 2706-8919
www.allstudyjournal.com
IJAAS 2025; 7(3): 23-29
Received: 09-01-2025
Accepted: 13-02-2025

Himanshi Chopra
Department of Amity Business School, Organization Amity University, Noida, Uttar Pradesh, India

Corresponding Author:
Himanshi Chopra
Department of Amity Business School, Organization Amity University, Noida, Uttar Pradesh, India

Impact of demographic variables and risk tolerance on investment decisions

Himanshi Chopra

DOI: https://www.doi.org/10.33545/27068919.2025.v7.i3a.1387

Abstract
This study shows relationship between pattern of investment and decision based on finance of investors and tolerance in terms of risk by the respondents. This paper uses the tolerance of financial risk on the basis of scale proposed by Grable and Lytton for the measurement of different aspects of risk in terms of finance. With the help of Kendall's W test, which sources of investments are preferred by individual investor? With the help of Chi-square test different demographic variables are identified and also their pattern of investing. The paper shows the investment patterns and decision making of the investors are affected by gender of the respondent.

Keywords: Risk tolerance, demographics, investment pattern, investment decision

Introductions
This paper is based on finding the impact of demographic variables in investment decision by one person and their financial risk tolerance. The financial decisions are effected by various factors out of which demographic variables like age, gender and occupation and individual risk tolerance are most considerable. This paper is based on the scale developed by Grable and Lytton (1999) [8] on financial risk tolerance of one person. Person invests in different market sector to attain returns. I think number of times there exist a gap between one person's sense of thinking about assumption of getting return and actual return he/she got after investment. This is due to error while taking investment decision which is mostly effected by one person's risk tolerance in investment. These paper is pointing out that most of the persons is not able to identify their actual level of risk they can easily take because of their need to be accepted socially. It identifies the issues developed from the psychology of investors and the decision which are irrational undertaken by person in behavioral finance.

Literature Review
Financial risk tolerance can be defined as a total amount of uncertainty an individual can take while taking a financial decision, which is taken by every individual in their social and economic life (Grable, 2000) [7]. There is an inverse relationship exist between risk taking and age of the person said by Jaggia and Thosar (2000) [20], they also find out that person who are investing for longer time allocate more part of their investment in the portfolio as they think they can tolerate more risk. Another factor is income of the individual that can help to avoid the risk. Higher income people can bear better losses than the people who has less income. Hinz *et al*. said that people with less income tend to take more risk. (Firda Nosita, 2020) [5].
In 2015 a researcher Heena made a conclusion that there exist relations in personality and demographic variables on the attitude of individuals against risk. She concludes that level of risk tolerance is proportional to earning. ude of investors against risk. (Heena, 2015) [9].
In 2010 researcher Dinesh and Abhijeet understand the psychology of investors which effect the behavior of investors while making investment decision. Various factors based on Psychology of investors' are level of confidence, conserve nature etc. They find out that investors can get a great help from more transparent and higher frequency of diffused information.
In 2010 a researcher Kabra *et al*. find out the factors that affect the process of making decision and behavior and risk patients of investment. The population of research is regular investors of market.

The population is sub-divided among the gender, age, working area and yearly earning. People prefer investment based on their preference towards risk. People who avoid risk are generally takes into account number of points and before they actually take investment decision they consider many information sources. This research find out that gender and age of investors effect the level of risk the people can take. (Kabra, 2010) [10].

In 1966 researcher Bernasek and Bajtelsmit study the research work that is already available against the gender of investors having different investment criteria. Female take investment decision which are quite different as compared to male and are opposite in considering their level of risk they can take. Preference of individual in investment and risk consideration with different gender is different. Job, earning and wealth of male/female affect the risk taking level. (Bajtelsmit, 1996) [1].

Objectives

The research work is based in the Psychology of investors which effect the decision they take while investing and where they like to invest. The research work finds out that there exists a relation between decision while investing and variables based on demography. Level of risk investors can take is known as Risk tolerance, or an investor can tackle the level of uncertainty. Risk tolerance of investor many times fluctuates with occupation, gender and age. A questionnaire is formulated to find out the level of risk tolerance. The main objective is to find out the person's investment decisions are affected by the factors which are deterministic. Then to identify the relationship between variables based on demography and the patterns of investment and investors makes decision during investments and lastly to find out the risk tolerance of investors by adopting different streams developed by Grable and Lytton.

- 1
- 2.

Hypothesis Testing

Based on Chi Square Test researcher will try to detect the relationship between different investments options like share, mutual funds, bonds etc which is a dependent variable and Gender, Occupation and Age which is independent variable in the study. Then again on the basis of Chi square test researcher is try to detect the relationship between level of risk investor can take called as Risk Tolerance which is a dependent variable in the study with the independent variables i.e. Occupation and Age. A chi-squared test, also known as a square test or two tests, is a type of statistical hypothesis test that can be used when the test statistic is distributed under the null hypothesis in a chi-squared manner. Pearson's chi-squared test and its variations fall under this category. If there is a statistically significant difference between the expected frequencies and the observed frequencies in one or more categories of a contingency table, it can be determined using Pearson's chi-squared test.

Methodology

The research works consider the cross sectional and descriptive research design. A convenient sampling technique is used based on Non-probabilistic and the sample population is investors that invest regularly in market. With the help questionnaire which is prepared in Delhi, India, responses of respondents were acquired. Total respondents were 115 out of which only 108 responses were accurately filled and undertaken for the research work. Collection of respondents responses were undertaken through various following methods:

1. Google form (Survey method)
2. 5 point scale (i.e. Likert scale)
3. SPSS
4. Factor analysis using Rotated component matrix
5. Bartlett's test (KMO value)

Theory of prospect

Correlation tests by Kendall rank Chi-square test Risk tolerance Scale proposed by Lytton and Grable is used for this research work.

On the basis of questionnaire, investment risk tolerance dimensions are noticed which are mentioned below:

Probable gambles versus Guaranteed, Risk preference that are general, Preference - confirmed loss and confirmed gain, Knowledge and experience while considering risk,

Comfort level of Risk, Speculation in risk, Theory of prospect and Risk related with investment.

Analysis of Data and Interpretation

Analysis of data is carried out in two streams. The first stream depicting the variables based demography and decision in investment and hypotheses testing. The second stream depicting level of risk investors are comfortable. Effect on the decision of investors is finding out by factor analysis. On the basis of pilot study and literature study total 9 variables are explored that are based on decision making of investors.

Table 1: Depict the relation between 9 variables explored from literature study and factors based on investment.

Factors based on decision of investment	Variables based on decision of investment
Security of investor	I prefer investment for living a secure and safe life.
	I prefer investment in risk free assets only.
	I prefer investment to fulfill the future requirements of my family.
Coverage of risk	I prefer investment to get the benefit by saving tax.
	I prefer investment for the coverage of risk.
	I prefer investment so that I can save for my retirement.
Planning of future	I would love to invest for a long period of time over a short period of time.
	I prefer savings so that I can secure my social obligation of future.

Table-II shows the rotated component matrix. Analysis based on Principal component is undertaken and method used is varimax rotation. Those variables which have highest loadings (more than 0.5 at least) come under the respective components or factors are obtained from the matrix i.e. rotated component matrix. Security of investor which contains three variables like requirement of family, secure and safe life and investment made assets which are largely loaded and are the factors that affect the decision regarding investment.

Table 2: Factor analysis to understand the factors influencing investment pattern

Rotated Component Matrix			
Variables of invest decision	**Components**		
	1	**2**	**3**
I prefer investment in risk free assets only.	.763	-.013	.206
I prefer investment for living a secure and safe life.	.727	.144	.342
I would love to invest for a long period of time over a short period of time.	.663	0.363	-0.092
I prefer savings so that I can secure my social obligation of future.	0.217	0.775	-0.043
I prefer investment to get returns like dividend and interest	-0.099	0.722	0.265
I prefer investment so that I can save for my retirement.	.331	.518	.201
I prefer investment to fulfill the future requirements of my family.	.404	.490	.436
I prefer investment for the coverage of risk.	.0380	.276	.804
I prefer investment to get the benefit by saving tax.	.292	.007	.750
Method based on Extraction: Analysis based on Principal Component. Method based on rotation: Varimax with Kaiser Normalization			
a. Rotation converged in 5 iterations.			

The tested KMO value is.781 for the adequacy of sampling and the result of significance based on statistics of the factor analysis are shown by Bartlett's test. The percentage of variance is 61.166% which is more than the acceptable range (more than 060.0%).

Table-III a test is conducted (Kendall's W Test) for testing the preferred source that affect the investors. 1-5 ranking is provided to the factors that influence the investors. Friends and Family have the major influence on investor's investment decision considering the Indian scenario with score of 1.61 which is least. The second one is Business news Channels. So here we can interpret that the person believes in impersonal sources as well as personal sources before investing. The mean rank of my broker/agent is 4.67 which is highest so its preference is least.

Table 3: Kendall's W test

Influencers for investment decision	Mean Rank
Friends and family	1.61
Newspapers - Financial	3.40
Channel of business news	2.24
My agent/broker	4.67
I use Google	3.08

Table-IV shows that mostly the population prefers investment in Shares, Mutual funds and Insurance because it looks to them as an option of safe investment for a long term. The second option for investment is Gold as it is risk less and they believe that no chance they lose their money with investing in Gold and the least preference option for investing is given to the corporate bonds.

Table 4: Option of investment - based on Preference

Options of Investing money	Freq.	% age	Acceptable % age	Cum. % age
Yellow metal (i.e. gold)	19	17.6	17.6	17.6
Shares	20	18.5	18.5	36.1
Mutual funds	20	18.5	18.5	54.6
Govt. bonds	17	15.7	15.7	70.3
Corporate bonds	12	11.2	11.2	81.5
Insurance	20	18.5	18.5	100.0
Total	108	100.0	100.0	

To find out the relationship among investors considering variables based on demography like occupation, gender and age and how the prefer to spend on investments, Chi-square test is conducted.

Hypothesis 1 (H_0): No serious relationship exists between the investment model and gender

The research shows that 27.7% of the male respondents like to invest in shares whereas 27.9% of the female mostly prefer to invest in mutual fund.

Table V shows Chi-square test is conducted between investment model and gender.

.014 is the value obtained from test, which is <0.05, therefore null hypothesis is rejected. Hence we can interpret that there is serious relationship exists between investment model and gender.

Table 5: Chi-square test -Investment model and gender

Investment model and gender	Significance	Degree of freedom	Asymptotic Significance
Chi-Square (Pearson)	14.246a	Five	.014
Likelihood Ratio	15.649	Five	.008
N of Valid cases	108		

a.1 cells (8.3%) have expected count <5. The minimum expected count is 4.78.

Hypothesis 2 (H_0): No serious relationship exists between the investment model and occupation

Table VI shows Chi-square test is conducted between investment model and occupation.

.541 is the value obtained from test, which is >0.05, therefore null hypothesis is accepted. Hence we can interpret that there is no serious relationship exists between investment model and occupation.

Table 6: Chi-square test- Investment model and occupation

Patterns of investment and occupation.	Significance	Degree of freedom	Asymptotic Significance
Chi-Square (Pearson)	18.711a	Twenty	.541
LR	19.720	Twenty	.476
N of Valid cases	108		
The minimum expected count is.11.			

Hypothesis 3 (H_0): No serious relationship exists between the investment model and age

Table VII shows Chi-square test is conducted between investment model and age.

.163 is the value obtained from test, which is >0.05, therefore null hypothesis is accepted. Hence we can interpret that there is no serious relationship exists between investment model and age.

Table 7: Chi-square test - investment model and age

Investment model and age	Significance	Degree of freedom	Asymptotic Significance
Chi-Square (Pearson)	26.078a	Twenty	.163
LR	27.069	Twenty	.133
N of Valid cases	108		
The minimum expected count is.33.			

Hypothesis 4 (H_0): No serious relationship exists between investors' risk tolerance & acceptance and occupation

In the research most no. of respondents after completing adequate research are willing to take risks and across various occupation they have average risk tolerance. 56.4% from the sample of respondents have occupation in Pvt. Sector, 60.0% of the respondents working in public sector and 51.1% respondents working as a Businessman are enjoy to accept risk after completing adequate research. The research shows that house wives (71.4%) avoid risk. To confirm the nature of above hypothesis, a test is conducted (Chi-square test) between investors risk tolerance and occupation, shown in Table VIII.019 is the value obtained from test, which is less than 0.05, therefore null hypothesis is rejected. Hence we can interpret that there is a serious relationship exists between investors risk tolerance & their acceptance and occupation.

Table 8: Chi-square test - risk tolerance and occupation

Risk tolerance and occupation	Significance	Degree of freedom	Asymptotic Significance
Chi-Square (Pearson)	19.768a	Nine	0.019
LR	16.812	Nine	0.052
N of Valid cases	108		
The minimum expected count is.65.			

Hypothesis 5 (H_0): No serious relationship exists between investors' risk tolerance & acceptance and age

Table IX shows Chi-square test is conducted between investors risk tolerance and age.

.424 is the value obtained from test, which is >0.05, therefore null hypothesis is accepted. Hence we can interpret that there is no serious relationship exists between investors risk tolerance and age.

Table 9: Chi-square test - risk tolerance and age.

Risk tolerance and age	Significance	Degree of freedom	Asymptotic Significance
Chi-Square (Pearson)	12.488a	Twelve	0.407
LR	12.269	Twelve	0.424
N of Valid cases	108		
The minimum expected count is.28			

Hypothesis 6 (H_0): No serious relationship exists between investors' risk perception and occupation

56% of the population working as public sector employees, 36.4% of the respondents working as private sector employees and businessman (38.1%) believe that risks refers to an opportunity while 85.7% housewives believes that risk refers to less.

Only businessmen consider taking risk in investment as compared to other occupation so they are called Risk taker as they assume thrill equivalent to risk and enjoy it.

Table X shows Chi-square test is conducted between investors risk perception and occupation.

0000 is the value obtained from test, which is less than 0.05, therefore null hypothesis is rejected. Hence we can interpret that there is a serious relationship exists between investors risk perception and occupation.

Table 10: Chi-square test - Investors risk perception and occupation

Investors risk perception and occupation	Significance	Degree of freedom	Asymptotic Significance
Chi-Square (Pearson)	42.440a	Nine	.00000
LR	34.686	Nine	.000
N of Valid cases	108		
a. 8 cells (50.0%) have expected count less than 5. The minimum expected count is 1.04.			

Dimensions of Risks Assessed by Each Item in the Risk Tolerance Questionnaire: The second stream of analyses of data is based on the level of risk the investors can take. With the help of scale of Risk tolerance developed by Lytton and Grable the questions based on risk tolerance are formulated in questionnaire and responses are recorded.

Theory of prospect is used as the Ist stream of risk in financial investment. In 1979 Tverseky and Kahnemann developed theory of prospect which is also known as behavioral theory of finance. On the basis of this theory people make risk taking decision. By this theory we can conclude that person have different view point regarding loss and profit.

Table XI depicts theory of prospect considering profit. As per the responses of people, 43.5% have selected option 1st i.e. Confirm profit of five thousand rupees and 53.5% have selected option 2nd i.e. they will take some risk. People chose option which is little variable as the variable option may results in higher profit to them against the option which provide little but confirmed profit.

Table 11: Theory of prospect - Considering Profit Suppose that ten thousand rupees is given to you without any condition. Now options available to you are:

Options	Freq.	%age	Acceptable %age	Cum. %age
Confirm profit of Five thousand rupees	47	43.5	43.5	43.5
Chance of fifty percent to earn ten thousand rupees and a chance of fifty percent to get no profit	61	56.5	56.5	100
Total	108	100	100	

Table XII depicts the theory of prospect considering loss. As per the responses of people, 61.1% have selected option 2nd i.e. Chance of Fifty percent to loss thousand rupees and a chance of fifty percent to get no loss when two thousand rupees given to them additionally so we can say that they are more comfortable with taking risk and 38.9% have selected option 1st i.e. a confirm loss of Five Hundred rupees.

People chose option which is variable against the option which results in a confirmed loss as it is in the nature of people to avoid any confirmed loss.

Table 12: Theory of prospect - Considering loss

Suppose that two thousand rupees is given to you an additional amount to you with already earned amount. Now options available to you are:				
Options	**Freq.**	**%age**	**Acceptable %age**	**Cum. %age**
Confirm loss of Five Hundred rupees	42	38.9	38.9	38.9
Chance of Fifty percent to loss thousand rupees and a chance of fifty percent to get no loss	66	61.1	1.1	100
Total	108	100	100	

Table XIII shows a class at which the investors are comfortable with risk. As per the responses of people, 43.5% avoid taking risk, choose option 1st. 38.9% are moderate thinking towards risk taking choose option 2nd and 17.6% of them choose option 3rd i.e. they appreciate risk and are comfortable while taking it.

Table 13: Theory of prospect - Nature of Risk

Suppose that twenty thousand rupees is given to you to invest, which option you choose?				
Options	**Freq.**	**%age**	**Acceptable %age**	**Cum. %age**
Sixty percent - Small risk Thirty percent - Moderate Risk Ten percent - More Risk taking	47	43.5	43.5	43.5
Thirty percent - Small risk Forty percent - Moderate Risk Thirty percent - More Risk taking	42	38.9	38.9	82.4
Ten percent - Small risk Forty percent - Moderate Risk Fifty percent - More Risk taking	19	17.6	17.6	100
Total	108	100	100	

Table XIV and XV depicts nature of risk tolerance - Investment risk and Knowledge & experience while dealing with risk. This correlates the investors' knowledge with his view point while measuring risk in high risk tolerance and tackling the risk. Table XIV shows that as per the response of the people, 28.7% select option 2nd i.e. prefer risk less investment, 32.4% opted for option 1st and 38.9% opted for option 3rd i.e. they would like to take risk in investments. People take decisions after getting a sense of knowledge about the market and find out that in market opportunity and risk both exists which is measured on the basis of their experience.

Table 14: Investment risk and Knowledge & experience while dealing with risk

Suppose that two thousand rupees is received by you suddenly, which option you choose?				
Choices	**Freq.**	**%age**	**Acceptable %age**	**Cum. %age**
Bank deposit, deposit in market acc. or a certificate of deposit	35	32.4	32.4	32.4
Investment in lowest risk bonds or MF bonds	31	28.7	28.7	61.1
Investment in MF - equity stock	42	38.9	38.9	100
Total	108	100	100	

From Table XV shows that as per the response of the people, after conducting proper analysis, they decides to take risk. They form 54.6% of the total sample. 20.4% of the samples are avoiding risk. Only 9.3% are choosing to be Risk lover and enjoying taking risk. 15.7% prefer risk Cautious. People have generally more patience towards risk than others who have experience and knowledge about the investment.

Table 15: Investment risk and Knowledge & experience while dealing with risk

Nature of risk	**Freq.**	**%age**	**Acceptable %age**	**Cum. %age**
Risk lover	10	9.3	9.3	9.3
With proper analysis the risk is taken	59	54.6	54.6	63.9
Cautious	17	15.7	15.7	79.6
A real risk avoider	22	20.4	20.4	100
Total	108	100	100	

Table XVI determines the Speculating risk as a stream of risk tolerance. As per the response of the people, 20.4% prefer option 1st i.e. they avoid risk, 31.5% prefer option 2nd i.e. moderate thinking towards risk taking and only 19.4% choose 4th option i.e. they are real risk lover and speculator.

Table 16: Speculating risk as a stream of risk tolerance

Suppose that a television channel has invited you and provide following options to you. Provide your choice:-				
Options	**Freq.**	**%age**	**Acceptable %age**	**Cum. %age**
A cash in hand of thousand rupees	22	20.4	20.4	20.4
A chance of fifty percent to win five thousand rupees	34	31.5	31.5	51.9
A chance of twenty five percent to win ten thousand rupees	21	19.4	19.4	71.3
A chance of five percent to win One lakh rupees	31	28.7	28.7	100.0
Total	108	100.0	100.0	

People who consider risk as fluctuating and loss are generally risk avoider and those who take risk as thrill and opportunity are risk lover. As per the response of the people, 39.8% consider risk as Opportunity and 14.8% consider as thrill shown in Figure 1. 30.6% of the respondents feel that it is an Uncertainty and 14.8% perceive it as loss.
54.6% of the total sample population considers risk as Gain and 45.4% perceive it as a sure loss.

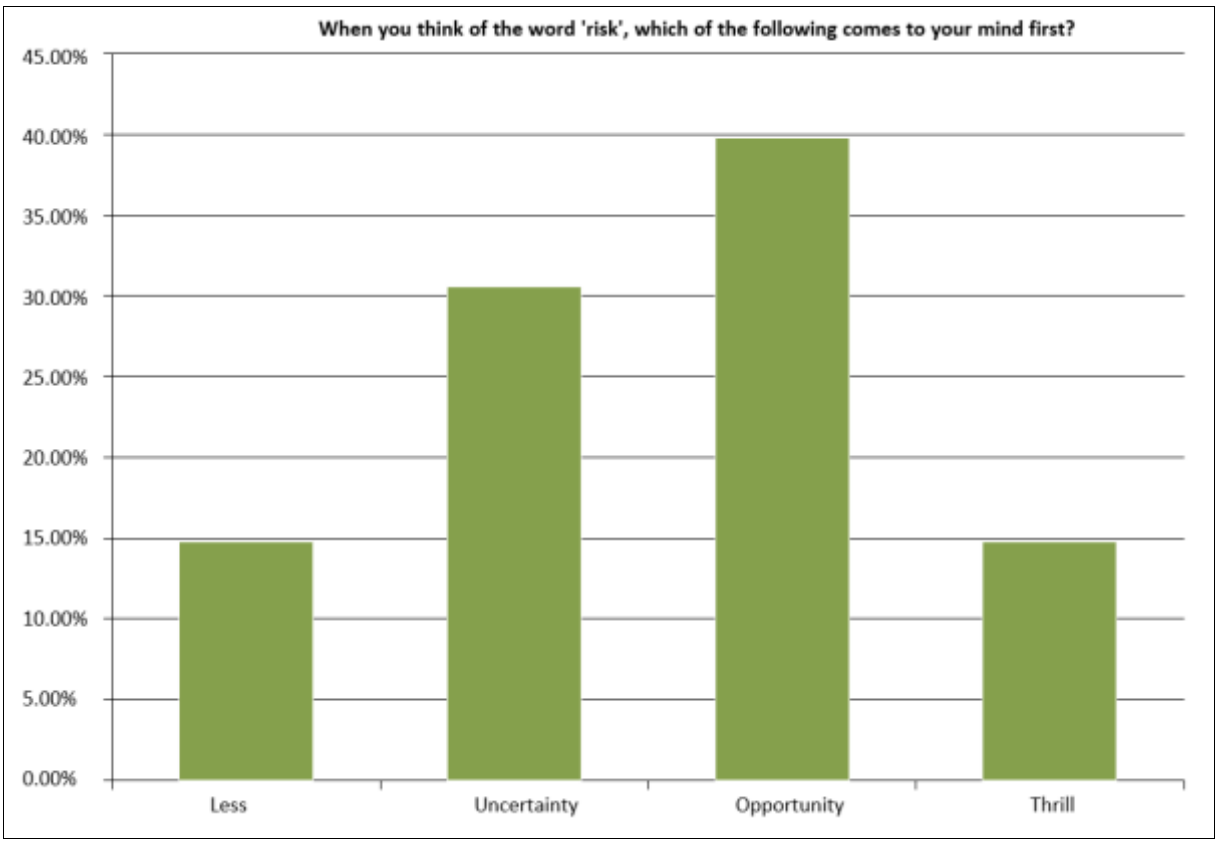

Fig 1: Shows Option between confirm profit and loss as a nature of risk tolerance. Discussion, finding and conclusion

By acquiring the knowledge of investment model and learning of decision making in relation to finance is quite interesting and very useful. Model of investment of people and decisions in relation to investment are affected by variables based on demography (i.e. Occupation, Gender and Age) and patience towards risk. The most important finding of this research work is that gender is the only variable of demography influencing the model of investment. The Chi-square test helps researcher to know that only the occupation of the people impacting the investor's patience towards risk and acceptance of risk. With the help of analysis of developed factors in research a conclusion is made that people prefer to invests 1st for their security and then to cover their risk and finally to plan for their future. With Kendall's W test the result obtained is that friends and family affect the decision of investors during investment. With the help of questionnaire the research work depicts the different nature of risk.53.5% of respondent are ready to take some risk. People chose option which is little variable as the variable option may results in higher profit to them against the option which provide little but confirmed profit.61.1% respondent are more comfortable with taking risk by going for option having greater variable losses as there is a hope of profit rather than selecting the option which results in confirmed loss.54.6% of the people after proper analysis love to take risk. 20.4% of the respondent are avoiding risk. Only 9.3% are choosing to be Risk lover and enjoying taking risk. 15.7% prefer risk Cautious. People have generally more patience towards risk than others who have experience and knowledge about the investment. As per the response of the people, 20.4% prefer to avoid risk, 31.5% prefer moderate thinking towards risk taking and only 19.4% prefer to be real risk lover and speculator.
54.6% of the total sample population considers risk as Gain and 45.4% perceive it as a sure loss**.**

References

1. Bajtelsmit VB. Why do women invest differently than men? Financial Counselling and Planning. 1996;7:1-10.
2. Bemestein J. The Investor's Quotient: The Psychology of Successful Investing in Commodities and Stocks. New York: John Wiley and Sons; c1993.
3. Chavali KM. Impact of demographic variables and risk tolerance on investment decision: An empirical analysis. International Journal of Economics and Financial Issues. 2016;6(1):169-175.
4. Duda HB. Rationality on the rise: Why relative risk aversion increases with stake size. Journal of Risk and Uncertainty. 2010;40(2):147-180.
5. Firda Nosita KP. Impact of demographic factors on risk tolerance. Journal of Security and Sustainability Issues. 2020;1327-1336.
6. Gilliam JG. Risk-tolerance estimation bias: Do married women and men differ? Journal of Consumer Education. 2010;27:45-58.
7. Grable JJ. A cross-disciplinary examination of financial risk tolerance. Consumer Interests Annual. 2000;46:1-7.

8. Grable JL. Financial risk tolerance revisited: The development of risk assessment instrument. Financial Services Review. 1999;8:163-181.
9. Heena T. Risk tolerance dependent on what? Demographics or personality type: Findings from an empirical research. Journal of Marketing and Consumer Research. 2015;6:48-56.
10. Kabra GM. Factors influencing investment decision of generation in India: An econometric study. Asian Journal of Management Research. 2010;1(1):308-326.
11. Kahneman DT. Prospect theory: An analysis of decision under risk. Econometrica. 1979;47(2):263-291.
12. Kogan NM. Risk taking: A study in cognition and personality. New York: Holt, Rinehart and Winston; c1964.
13. Lampenius NZ. Development and validation of a model and measures of financial risk-taking. Journal of Behavioural Finance. 2005;6(3):129-143.
14. Lewellen WL. Patterns of investment strategy and behaviour among individual investors. The Journal of Business. 1977;51(7):296-333.
15. Lewellen WL. Patterns of investment strategy and behaviour among individual investors. The Journal of Business. 1997;50(3):59-67.
16. Michael JG. Effects of framing on measures of risk tolerance: Financial planners are immune. Journal of Behavioural Economics. 1990;19:3237-3246.
17. Moreschi R. An analysis of the ability of individuals to predict their own risk tolerance. Journal of Business and Economic Research. 2005;3(2):39-48.
18. Shefrin HS. Behavioural aspects of the design and marketing of financial products. Financial Management. 1993;22(2):123-134.
19. Wilbur GL, Lewellen RC. Patterns of investment strategy and behaviour among individual investors. The Journal of Business. 1997;50(3):59-67.
20. Jaggia S, Thosar S. Risk aversion and the investment horizon: A new perspective on the time diversification debate. The Journal of Psychology and Financial Markets. 2000 Sep 1;1(3-4):211-215.