

## Exploring Risk Tolerance Factors that Influence Investment Decision

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### Abstract:

Risk tolerance is a term widely used in the personal financial planning industry to refer to an investor's attitude towards risk. In 21<sup>st</sup> century, it is very important to understand for financial investment decisions. However, risk tolerance has different dimension. Thus, in current study it is try to identify risk tolerance factors that influence on investment decision. Current study confirms the three risk tolerance factors that influence Investment decisions, for that 320-sample size and exploratory factor analysis were performed. Thus this study is helpful to understand risk profiles of investors and also help them to understand level of different factors of risk tolerance.

**Keywords:** Risk Tolerance, Investment Decision, Investors, Exploratory factor analysis

### 1. Introduction:

In today's word, financial investment decision became a very complex process due to presence of different complex investment instruments in financial markets. However, in personal financial planning industry risk tolerance is widely used to refer to an investor's attitude towards risk those results in investment decision. It can be defined as the amount of uncertainty or investment return volatility that an investor is willing to accept when making a financial decision (Grable, 2000; Grable and Lytton, 1999) or the extent to which an individual is prepared to risk experiencing a less attractive outcome in the pursuit of a more attractive outcome (Davey, 2000).

Risk is defined as "the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realized" (Sitkin and Pablo, 1992, p.10). Financial risk tolerance, on the other hand, is defined as "the maximum amount of uncertainty someone is willing to accept when making a financial decision" (Grable, 2000, p.625).

It is accepted that financial risk tolerance plays an important role in people's personal and professional lives. According to Grable (2000), financial risk tolerance investigations should not only include psychological factors but also should incorporate demographic, socioeconomic, and attitudinal factors, since considerations, such as gender, age, marital status, income, and occupation may influence a person's level of risk taking in everyday money matters.

In the same context, purpose of this study is to explore the factors of financial risk tolerance.

## **2. Review of Related Literature:**

In broader term, risk tolerance, as research did not emerge as a subject of importance until the 1900s. Bernoulli's logic for the basis of risk taking propensity was accepted by the all economist until two notable studies prior to the 1950s were undertaken first by Keynes (1921) and second Knight (1921). Addition to this, Keynes' (1937) published the general theory with notable understanding of risk tolerance. Wallach and Kogan (1959; 1961) had contributed a major advancement in the study of choice in risky situations. These researchers developed the widely used Choice Dilemmas Questionnaire to measure risk tolerance in everyday life situations. According to Bernstein (1996), "the modern conception of risk is rooted in the Hindu-Arabic numbering system that reached the West seven to eight hundred years ago". He also pointed out, most research attempts to understand investor risk tolerance have occurred recently.

In the next part research, methodology to be undertaken for getting the direction for further research is discussed. Based on the literature review 12 statements of risk tolerance measure were included in study. Using this 12 statement present study is tried to explore factors using exploratory factor analysis.

## **3. Research Methodology**

The study aims consider those investors who are residing in Gujarat, who invests in any of the various investment avenues, must be an adult (able to make his own decisions and have enough purchasing power). Sampling units were households in the major cities of Gujarat consisting investors recruited through convenience sampling. The research design used was "quantitative, descriptive and non-experimental".

Respondents were recruited through non-probability convenience sampling method. A Structured questionnaire was administered for data collection. Data were collected through personal contact approach. The questionnaire (Annexure II) was then circulated among 320 respondents and this was completed in 2.0 months.

There were three dimensions of risk measured by these 12 items, which included probable versus guaranteed choice, risk choice in general, sure gain versus sure loss selection, risk as understanding and experience, level of comfort, speculative risk, theory of prospect, and investment related risks.

A principle component factor analysis was performed in order to further refine the measures. The result produced a 12-item measure that tests the constructs of investment risk, capital risk comfort and experience, and speculative risk.

The collected data was processed and analysed in accordance with the objectives and requirement of the study. Based on the distribution of the descriptive statistics

obtained from the study that showed a normal distribution, frequency distribution was used. Inferential statistics was used to draw conclusions about the populations on the basis of data obtained from samples. The data analysis for this study has been performed with SPSS 20.0 for windows. Factor analysis was used for factor extraction.

#### **4. Data Analysis**

##### 4.1 Descriptive Analysis:

Information about the profiles of the respondents was provided in the annexure I: Table 1. The results showed that majority of the respondents were male (n = 242, 75.6%) with only 78 female respondents (24.4%). Sample was dominated by respondents within the age group of 26-35 (n = 147, 45.9%) and 21.3% in age group below 25.

However out of 320 respondents 57 were above 45 years. Moreover, sample was inclined towards highly educated respondents as majority of respondents were postgraduate and above (n=206, 64.4%). Out of 320 respondents 225 respondents (70.3%) are married where as 95 respondents were not married.

In the sample 31.9% respondents were without a child whereas 91 respondents had only one child (28.4%) and 111 respondents had two children (34.7%) but very few respondents had more than two children (5%).

Most of the respondents were having a household size of three to five person (n= 197, 61.6%) while 23.4 % of respondents had a household size of less than 3. The sample was dominated by full time working professionals (n= 257, 80.3%) whereas 17 respondents were self employed and 23 respondents were homemakers.

The sample was balanced in terms of income with 108 respondents being in the income group of Rs.10001 and Rs.30000 whereas rest of the respondents could be considered in the higher income group. The sample includes 85 respondents in the income group of Rs.30001 to Rs.50000 and again 85 respondents in income group of more than Rs.50000. Overall the sample can be called balanced in terms of income. Summary of sample profile is shown in Annexure I: Table 1.

##### 4.2 Factor analysis:

Reliability statistics Cronbach Alpha for the 12 statements of risk tolerance were found 0.728 (Annexure II: Table 2). Value is quite above standard value of 0.700 and thus, further research can be carried on.

In order to assess the underlying dimensions of risk tolerance scale, exploratory factor analysis was performed. For that, all thirteen variables were entered and principal component analysis (PCA) was selected to extract factors. Varimax rotation method was used. Results on anti-image correlation matrix indicated that all measuring sampling adequacy (MSA) values at diagonal were higher than 0.5 (Hair et al. 2009). From communality results, it was found that the communality value for variable RT01,

RT03, RT05, RT06, RT07, RT08 and RT12 is less than lower limit value 0.5. However, only one variable at a time was allowed to be extracted from the factor.

So, RT01 variable was omitted from the list, which had least communalities of 0.285. Remaining 11 statements were entered again. The anti-image results for these 11 statements were satisfactory, but variable RT 08 got communality value of 0.335 and hence deleted.

Again factor analysis was run on rest of 10 variables and anti-image correlation matrix was obtained. The anti-image results for these 10 statements were satisfactory, but Here, RT07 variable was omitted from the list, which had least communalities of 0.354. It was also less than 0.5 and hence deleted.

Remaining 9 variables were run again and as anti image result indicated that all the variables have MSA value more than 0.5. Hence, by proceeding further, RT12 variable is omitted from the list, which had the least communalities of 0.416, which is 0.5.

Finally, factor analysis was performed on remaining 8 variables. The KMO Measure of Sampling Adequacy was 0.717 and significant of Bartlett's test of sphericity ( $p < 0.001$ ) indicated that factor analysis could be useful (Annexure I: table 3). Results indicated that all nine variables were extracted into three factors based on eigenvalues higher than 1. These three factors explained 57.861% variance in risk tolerance (Annexure I: table 4) and shown with its loading (Annexure I: table 5).

- ✓ The first factor contributed up to 21.4945% of variance and was made up of four variables. Out of the four variables, three variables measured the basic aspects of Investment risk while measuring risk tolerance level were as consistent with Gilliam, Chatterjee and Garble (2010) study. Thus, this factor was named as "*Investment Risk Tolerance (IRT)*".
- ✓ Second factor explained 19.245% of variance in common core with two variables. These two variables were used to measure the aspects of speculative risk when measuring risk tolerance level and were as consistent with Gilliam, Chatterjee and Garble (2010) study. Thus, this factor was named as "*Speculative Risk Tolerance (SRT)*".
- ✓ Third factor contributed up to 17.1216% of variance and made up of two variables. These two variables measured the capital risk tolerance level of investor and were consistent with Gilliam, Chatterjee and Garble (2010) study. Thus, this factor was named as "*Capital Risk Tolerance (CRT)*" (Annexure I: table 4 and 5).

## 5. Findings of the Study

- Three factors were extracted which were considered important for measuring the influence of risk tolerance on the investment decisions
- The IRT, SRT and CRT were the three important factors one should consider when finding out the influence of financial risk tolerance on investment decisions.

➤ The three factors named “IRT”, “SRT” and “CRT” contributed to 21.4945%, 19.245% and 17.1216% of variance respectively as consistent with (Gilliam, Chatterjee, and J Grable, 2010) study.

## 6. Limitations of the Study

This study is an attempt to study the Impact of Risk Tolerance on Investment decisions. Care and attention had been taken to ensure that the research was designed and optimized to achieve the objectives of the study. However, sometimes it is very difficult to conduct the study with complete perfection due to personal resource constraints in terms of time, manpower and money. Some other limitations are listed below

- There are different methods to measure the risk tolerance and investment decisions and different assessment and measurement techniques have been developed for the same. In this regards, views of experts may differ from one another.
- The study used the non- probability convenience sampling method. So the limitations of this method are applicable to findings of the study also.
- Accuracy of the analysis and interpretation is dependent upon the accuracy and profitability of the sources of the data collected
- The target population for this study is the investors across Gujarat. Therefore the generalisation of the findings of this study to investors other than that might be limited.

## 6. Conclusion

12 statements given for measuring risk tolerance level can be further divided in to three factors of risk tolerance namely IRT, SRT and CRT. Furthermore, these three dimensions of risk tolerance can be used to understand influence of it on investment decision. This way they can used for earn maximum return for their investment for sustainable wealth.

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**Annexure I: Tables****Table 1: Sample Profile**

<b>Demographic variables</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent</b>
Gender	Male	242	75.6
	Female	78	24.4
Age	Less than 25	68	21.3
	26-35	147	45.9
	36 to 45	48	15
	Above 45	57	17.8
Education	Up to HSC	18	5.6
	Under Graduate	15	4.7
	Graduate	81	25.3
	Post-graduate and higher	206	64.4
Marital status	Married	225	70.3
	Unmarried	95	29.7
Monthly Income	Less than 10,000	42	13.1
	10,001- 30,000	108	33.8
	30,001-50,000	85	26.6
	More than 50,000	85	26.6
Profession	Full time	257	80.3
	Part time	23	7.2
	Self employed	17	5.3
	Homemaker	23	7.2
Household size	Less than three	75	23.4
	3 to 5	197	61.6
	More than 5	48	15
Home ownership	Yes	209	65.3
	No	111	34.7
No of Children	None	102	31.9
	One	91	28.4
	Two	111	34.7
	Three	14	4.4
	More than three	2	0.6

**Table 2: Reliability Statistics**

<b>Study variable</b>	<b>No. of statements</b>	<b>Cronbach Alpha</b>
Risk Tolerance	12	0.728

**Table 3: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.717
Bartlett's Test of Sphericity	Approx. Chi-Square	300.142
	Df	28
	Sig.	0.000

\* indicates p < 0.001 levels

**Table 4: Factors with Eigen values, Percentage of Variance and Cumulative Percentage of Variance**

Factors	Eigenvalues	% of Variance	Cumulative % Variance
Factor 1	1.7196	21.4945	21.4945
Factor 2	1.5396	19.2450	40.7395
Factor 3	1.3697	17.1216	57.8611

**Table 5: Factor and Corresponding Items with Factor Loadings**

Variable Name	Factor 1 Investment Risk	Factor 2 Speculative Risk	Factor 3 Capital Risk	Communality
RT10	0.735			0.559
RT04	0.634			0.618
RT05	0.615			0.542
RT06	0.611			0.548
RT11		0.787		0.630
RT09		0.693		0.612
RT03			0.758	0.576
RT02			0.692	0.545



**PART A: Basic Information**

1. Age group:  less than 25  26 to 35  36 to 45  above 45
2. Gender: :  Male  Female
3. Marital status:  Married  Unmarried
4. Education (highest degree):  Up to HSC  Under graduate  Graduate  
 Post graduate and higher
5. Home ownership:  Yes  No
6. No. of Children (if any): \_\_\_\_\_
7. Household size:  Less than three  3 to 5  more than five
8. Profession:  full time  part time  self employed  homemaker
9. Monthly Income:  less than 10000  10001-30000  30001-50000  
 More than 50000

**PART B Financial Risk Tolerance**

1. In general, how would your best friend describe you as a risk taker?\*

  - a. A real gambler
  - b. Willing to take risks after completing adequate research
  - c. Cautious
  - d. A real risk avoider

2. You are on a TV game show and can choose one of the following, Which would you take?
  - a. Rs.20, 000 in cash
  - b. A 50% chance at winning Rs. 1, 00,000
  - c. A 25% chance at winning Rs. 2, 00,000
  - d. A 5% chance at winning Rs. 20, 00,000
3. You have just finished saving for a “once-in-a-lifetime” vacation. Three weeks before you plan to leave, you lose your job. You would:
  - a. Cancel the vacation
  - b. Take a much more modest vacation
  - c. Go as scheduled, reasoning that you need the time to prepare for a job search
  - d. Extend your vacation, because this might be your last chance to go first-class
4. If you unexpectedly received Rs. 2, 20,000 to invest, what would you do?
  - a. Deposit it in a bank account, money market account, or an insured CD
  - b. Invest it in safe high-quality bonds or bond mutual funds
  - c. Invest it in stocks or stock mutual funds
5. In terms of experience, how comfortable are you investing in stocks or stock mutual funds?
  - a. Not at all comfortable
  - b. Somewhat comfortable

- c. Very comfortable
6. When you think of the word “risk”, which of the following words comes to mind first?
- Loss
  - Uncertainty
  - Opportunity
  - Thrill
7. Some experts are predicting prices of assets such as gold, jewels, collectibles, and real estate (hard assets) to increase in value. Bond prices may fall; however, experts tend to agree that government bonds are relatively safe. Most of your investment assets are now in high interest government bonds. What would you do?
- Hold the bonds
  - Sell the bonds, put half the proceeds into money market accounts, and the other half into hard assets
  - Sell the bonds and put the total proceeds into hard assets
  - Sell the bonds, put all the money into hard assets, and borrow additional money to buy more
8. Given the best and worst case returns of the four investment choices below, which would you prefer?
- Rs. 1000 gain best case; Rs. 0 gain/loss worst case
  - Rs. 5000 gain best case; Rs. 1000 loss worst case
  - Rs. 15000 gain best case; Rs. 5000 loss worst case
  - Rs. 30000 gain best case; Rs. 15000 loss worst case
9. In addition to whatever you own, you have been given Rs. 20, 000. You are now asked to choose between:
- A sure gain of Rs. 10, 000
  - A 50% chance to gain Rs. 20, 000 and a 50% chance to gain nothing and In addition to whatever you own, you have been given Rs. 12,000. You are now asked to choose between:
  - A sure loss of Rs. 3000
  - A 50% chance to lose Rs. 6,000 and a 50% chance to lose nothing
- 1 and 4
  - 2 and 4
  - 1 and 3
  - 2 and 3
10. Suppose a relative left you an inheritance of Rs.10,00,000, stipulating in the will that you invest ALL the money in ONE of the following choices. Which one would you select?
- A savings account or money market mutual fund
  - A mutual fund that owns stocks and bonds
  - A portfolio of 15 common stocks
  - Commodities like gold, silver, and oil

11. If you had to invest \$20,000, which of the following investment choices would you find most appealing?

- a. 60% in low-risk investments, 30% in medium-risk investments, 10% in high-risk investments
- b. 30% in low-risk investments, 40% in medium-risk investments, 30% in high-risk investments
- c. 10% in low-risk investments, 40% in medium-risk investments, 50% in high-risk investments

12. Your trusted friend and neighbor, an experienced geologist, is putting together a group of investors to fund an exploratory gold mining venture. The venture could pay back 50 to 100 times the investment if successful. If the mine is a bust, the entire investment is worthless. Your friend estimates the chance of success is only 20%. If you had the money, how much would you invest?

- a. Nothing
- b. One month's salary
- c. Three month's salary
- d. Six month's salary