

Behaviour of Investors in the Stock Market: Does Age Matter?

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Abstract

Most financial theories are based on the concept that individuals act rationally and consider all available information in the decision-making process. Behavioural finance is the study of the methodical errors made by market participants due to psychological biases. The primary objective of the study was to look at the behaviour of investors among different age groups. This paper investigated how investors in the young, middle, and old age groups differed in their investment behaviour. A survey of 100 investors from Pondicherry was conducted through personal interviews with the help of a structured questionnaire. The data were analyzed using the Kruskal-Wallis H Test and F test. The study proves that there is a significant difference between the age group of the investors with respect to their saving objectives, experience, and proportion of investment. The study concludes that there existed significant differences between the investors belonging to different age groups, and particularly, investors in the young and old age groups differed while making investments in the stock market.

Keywords: age difference, behavioural finance, investment decision, investors' behaviour, saving objective

JEL Classification: G02, G10, G11

Paper Submission Date : September 29, 2013; **Paper sent back for Revision :** February 5, 2014; **Paper Acceptance Date :** April 17, 2014

Most financial theories are based on the concept that individuals act rationally and consider all available information in the decision-making process. Behavioural finance is the study of the methodical errors made by market participants due to psychological biases. Therefore, it is “the study of how humans interpret and act on information to make informed investment decisions” (Lintner, 1998, pp. 7-8).

Behavioural finance is the study of the influence of psychological factors on the evolution of financial markets, and tries to describe the interaction of psychology and finance to develop models and theories to have a deeper and better understanding of the investment pattern of the investors. It also gives guidance to investors to understand how emotions and cognitive errors influence investors and the decision making process and studies how investors behave while trading in financial products (Siddiqui, 2008).

It is also observed that demographic variables like gender, age, marital status, education, and income influence the investment behaviour of individuals and their decision making (Jain, 2012 ; Lewellen, Lease, & Schlarbaum, 1977 ; Ramanujam & Devi, 2012 ; Shaikh & Kalkundrikar , 2011b ; Waweru, Evelynne, & Uliana, 2008). Among different demographic factors, age is found to be most important determinants of investor style (Wang, 2011). Furthermore, the behaviour of investors towards the stock market (SM) can be studied from several viewpoints, that is, investment objectives, experience, proportion of investment, investment strategy, source of information, and so on. Previous studies have shown that young people are less risk averse than the older people, and they have different attitudes toward financial decisions than those possessed by their older counterparts (McInish, 1982;

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Morin & Suarez, 1983). However, there arises a scope for studying the facts behind these issues. Hence, this paper attempts to investigate whether investors in the young and old age group differed in behavioural aspects with regards to investments in the stock market.

Review of Literature

A number of studies have been done by many researchers regarding investments in stock markets, particularly on investors' attitudes, preferences, and behaviour. In this context, a few appropriate studies are reviewed here that are related to investors' behaviour towards stock market investments.

Lewellen et al. (1977) found that age, gender, income, and education affect the investors' preference and attitudes towards their investment decisions. The demographic factors had an impact on retail investors' investment decisions (Shaikh & Kalkundrikar, 2011b). Varadharajan and Vikkraman (2011) studied the perception of investors and their attitude towards selection of stocks, risk, company, and expected return, and found that age, occupation, and experience of an investor do not affect the risk they are prepared to take, and there is no significant association between percentage of returns, risk appetite, and factors that influenced the investment decisions of investors.

Jain and Thakur (2012) examined the relationship between age of the investors and their investment-related characteristics and found that there was no significant relationship between age and investors' investment strategies, reason to invest in capital markets, fund management strategy, and awareness & investors' risk bearing capacity. Shaikh and Kalkundrikar (2011a) revealed that the level of knowledge significantly leveraged the returns on investment and also found that there is a negative correlation between occupation of the investors, and the level of risk assumed by them. Shylajan and Marathe (2006) identified the major factors responsible for determining the attitudes and behaviour of stock market investors. Feng and Seasholes (2008) found that there is no significant relationship between investors' age and the percentage of equities in investors' portfolios. Shanmugasundaram and Balakrishnan (2011) pointed out that the industry factor has a significant relationship with age of the investors.

These studies support the view that the behaviour of investors varies and is influenced by several factors. Hence, the present paper is an attempt to analyze the effect of the age of the investors towards stock market investments.

Objectives of the Study

In order to answer the question, the following objectives were framed :

- To study the difference in saving objectives of investors towards stock market among the investors of various age groups.
- To analyze the differences in investment decisions based on the experience of various age group of investors.
- To estimate factors that influenced the investors to invest in the stock market.
- To study the investors' objective of investment in the stock market.
- To analyze the difference in proportion of investment made by the investors of various age groups.

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Hypotheses

The following hypotheses were developed to study the behaviour of different age groups of investors :

- **H01** : There is no significant difference between age and saving objectives of investors making investments in the stock market.

➤ **H02** : There is no significant difference between age and experience of investors making investments in the stock market.

➤ **H03** : There is no significant difference between age of the investors and the factors affecting the selection of an investment in the stock market.

➤ **H04** : There is no significant difference between the age of the investors and the objective of making investments in the stock market.

➤ **H05** : There is no significant difference between the age of the investors and proportion of investments made by them in the stock market

Research Methodology

➤ **Data Source** : The data required for the study were collected through a structured questionnaire from the investors who had made investments in the stock market. The study is confined to Puducherry region only with a sample size of 100 investors. Data for the study was collected during August 2013. The collected data were analyzed using appropriate research methods with the help of Statistical Package for Social Sciences (SPSS).

➤ **Research Methods** : For testing H01 and H04, the Kruskal Wallis H Test (or simply stated as 'H test') was used, while for testing hypotheses H02, H03, and H05, ANOVA was used. Based on the responses from the questionnaire, the analysis had been carried out. For this purpose, the age of the investors was classified into three groups, that is, respondents who were below 30 years of age were grouped under the 'young age group,' respondents whose age was between 31 to 50 years were grouped under the 'middle age group,' and the respondents whose age was above 51 years were grouped under the 'old age group'.

(1) Kruskal Wallis (H) Test : The H - test is a non-parametric test, which is equivalent to one-way ANOVA used for the comparison of more than two independent groups. It is used to compare three or more sets of scores that come from different groups. The H - test formula is as follows:

$$H = \frac{12 \sum \left(\frac{R^2}{n} \right)}{N(N+1)} - 3(N+1) \sim \chi^2_{k-1 \text{ df}} \quad \dots\dots\dots (1)$$

where,

R = Sum of rank of each group,

N = Total number of observations,

n = Number of observations in each group,

k = Number of groups.

(2) ANOVA : ANOVA (F - test) is a technique used to test the significance of the difference when multiple samples are involved. It is used to test for differences among the population by examining the amount of variation within the samples and the relative amount of variation between the samples. The two estimates of variance are compared with F -test, which can be calculated as:

$$F = \frac{(\text{Variance between sample } (V_1))}{(\text{Variance within sample } (V_2))} \quad \dots\dots\dots (2)$$

$$V_1 = \sum_i n_i (\bar{Y}_i - \bar{Y})^2 / (K - 1)$$

where,

Table 1. Results of the H Test on Saving Objectives of Investors Among the Three Levels of Age Groups

Saving Objectives	Age Group	N	Mean Rank	H Test	Sig.
To provide for retirement	Young age group	28	48.11	9.241	0.010**
	Middle age group	55	45.88		
	Old age group	17	69.38		
	Total	100			
For tax saving	Young age group	28	59.05	4.094	0.129
	Middle age group	55	47.23		
	Old age group	17	47.00		
	Total	100			
To meet contingencies	Young age group	28	64.30	12.937	0.002*
	Middle age group	55	41.52		
	Old age group	17	56.82		
	Total	100			
For children's education	Young age group	28	48.34	20.758	0.000*
	Middle age group	55	59.82		
	Old age group	17	23.91		
	Total	100			
For purchase of assets	Young age group	28	63.00	7.988	0.018**
	Middle age group	55	46.93		
	Old age group	17	41.47		
	Total	100			
For children's marriage	Young age group	28	43.25	29.732	0.000*
	Middle age group	55	63.09		
	Old age group	17	21.71		
	Total	100			

*Significant at 1%, **Significant at 5%

$\bar{Y}_i$ = sample mean in the i^{th} group,

n_i = number of observations in the i^{th} group,

$\bar{Y}$ = overall mean of the data, and

K = number of groups.

$$V_2 = \sum_{ij} (Y_{ij} - \bar{Y}_i)^2 / (N - K)$$

where,

Y_{ij} = j^{th} observation in the i^{th} out of K groups and,

N = overall sample size,

$K - 1, N - K$ = degrees of freedom under the null hypothesis.

Analysis and Results

The Kruskal-Wallis H Test was used to test whether the saving objectives of investors towards stock market investments varied with the three levels of age groups. The results of the test are presented in the Table 1. The

Table 2. Test of Significance Between Age of Investors and their Experience of Investment in Stock Markets (ANOVA Results for Age and Experience)

Experience in SM Investment	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.493	2	13.247	12.639	0.000*
Within Groups	101.667	97	1.048		
Total	128.160	99			

*Significant at the 1% level

Table 3. Results of Intra-Comparison - Age Group Mean Difference

(I) Age Group	(J) Age Group	Mean Difference (I-J)	Std. Error	Sig.
Young age group	Middle age group	-0.692	0.238	0.012**
	Old age group	-1.576	0.315	0.000*
Middle age group	Young age group	0.692	0.238	0.012**
	Old age group	-0.883	0.284	0.007*
Old age group	Young age group	1.576	0.315	0.000*
	Middle age group	0.883	0.284	0.007*

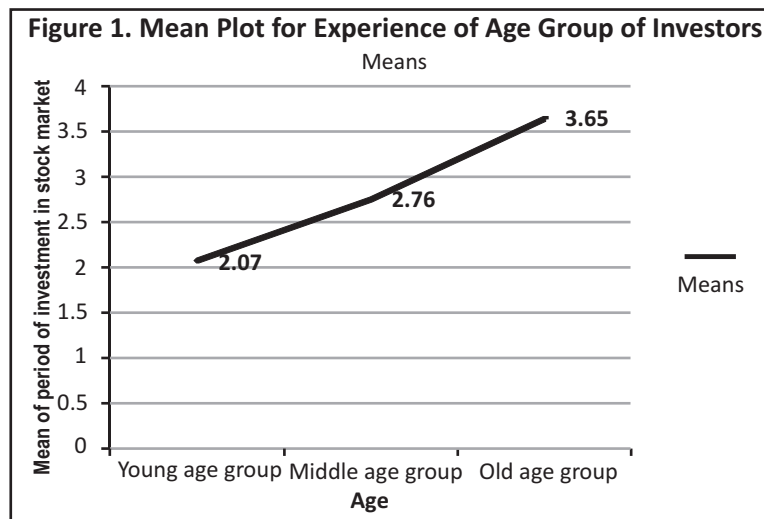
*Significant at 1%, **Significant at the 5% level

results of the H test (Table 1) reveal that there is a significant difference between the investors belonging to different age levels with respect to their saving objectives while making investments in the stock market. However, the difference is not significant for the saving objective - 'tax saving,' which reveals that there is no significant difference between age of the investors and the saving objective 'tax saving'. The mean rank of the saving objectives on the basis of age level reveals that while the young respondents saved for their children's marriage as well as for their education, the middle aged respondents preferred saving for contingencies. Since the p - value is less than 0.05 for all the saving objectives, the H01 is rejected and leads us to conclude that there is a significant difference between age and the saving objectives of investors making investments in the stock market.

From the Table 2, it can be inferred that the mean square has much difference between them (13.247 and 1.048) resulting in a significant difference. Since the p -value 0.000 is less than 0.05, the hypothesis H02 is rejected. Hence, we conclude that there is a significant difference between age and experience of investors making investments in the stock market. The results of ANOVA do not indicate which of the three categories of investors, based on age level, differed from one another. In order to accurately ascertain which age group of investors differed among themselves, the post-hoc test was performed. The Table 3 shows the results of the post-hoc test, revealing which group differs from which one.

From the Table 3, it is inferred that in terms of experience of investing in the stock market, there was a significant difference between the young and middle-aged group of investors ($p = 0.012$) as well as between the young and old aged group of investors ($p = 0.000$). Hence, there is a significant difference in the experience possessed by the middle-aged and young respondents ($p = 0.012$) as well as the middle-aged and old age group of investors while investing in stocks ($p = 0.007$). More specifically, there is a huge difference in terms of experience possessed by the young and old investors while investing in the stock market.

The results prove that there is a statistically significant difference between age groups as proved by one-way ANOVA ($F = 12.639$, $p = 0.000$). The Tukey post-hoc test reveals that the experience of the investors investing in the stock market is statistically significant among the young and old age group of investors. By using the Turkey post-hoc test, the experience of the respondents was separated into three groups based on the age of the investors. In the mean plot, as shown in the Figure 1, the respondents falling in the young age group had less experience in the field of stock market investments. The mean is high for old age group of investors, indicating that they had rich experience in the field of stock market investments.



➤ **Selection of Factors Influencing the Choice of Investment :** One of the important components of behavioural finance is the stock selection process. Before investing, the investors generally consider their needs, objectives, and constraints while making investments. However, every time, it is not possible for the individual investors to make a successful decision and attain the desired investment goals as they are influenced by several other factors too before investing in the stock market, that is, dividend, inflation, risk, and so forth. Das (2012) identified five factors, that is, financial statement of the company, referral, public information, profitability variables, and accounting information which influenced the investors' stock selection decision while making investments in the stock market. Benet, Selvam, Ebenezer, Karpagam, and Vanitha (2011) pointed out that return on equity, quality of management, return on investment, price to earnings ratio and finally, various ratios of the company are the factors that influence the stock selection behaviour of investors. However, in the present study, 10 factors were taken based on the past studies and the same were tested using ANOVA. Accordingly, the hypotheses were framed to test the factors affecting the selection of investment in the stock market.

To test whether the factors affecting the selection of investment varies with the age of the investors, ANOVA (F test) was performed, and the results are shown in the Table 4. It is inferred from the Table 4 that the difference is found to be significant for two factors, namely return on investment and inflation. However, the difference is not significant for factors, that is, capital appreciation, period of holding, risk level, tax benefit, company size and reputation, liquidity, market trend, and government policies. The mean sum of squares between the groups for return on investment (4.083) and inflation (13.623) shows that there exists a significant difference between the age group of investors and the factors influencing them to prefer stock market investments. The factors, that is, return on investment and inflation are impacted differently with respect to their age levels. All other factors, that is, capital appreciation, period of holding, risk level, tax benefit, company size and reputation, liquidity, market trend, and government policies are independent of the age group of investors.

The p -value for the factors, that is, return on investment and inflation is less than 0.05, which leads us to conclude that there is a significant difference between the age of the investors and the factors influencing the selection of investments in the stock market. In particular, we can say that the factors like return on investment and inflation had a great influence on the investors to invest in the stock market. However, the p - value for other factors is more than 0.05 (which is not significant). Hence, it leads to the conclusion that there is no significant difference between different age group of investors and the factors influencing the selection of investment portfolio in the stock market, and therefore, the hypothesis H03 is accepted.

To test whether the investment objective of the investors varied within three levels of age groups, the H test was applied, and the results of the test are shown in the Table 5. The analysis reveals that the investors belonging to various age groups did not vary significantly with regard to the investment objective in the stock market. Since the p - value $0.196 > 0.05$, the hypothesis H04 is accepted. ANOVA was used to test whether the proportion of

Table 4. Results of the ANOVA Test for Age and Factors Influencing the Selection of Investments

Factors		Sum of Squares	df	Mean Square	F	Sig.
Capital Appreciation	Between Groups	0.471	2	0.236	0.774	0.464
	Within Groups	29.529	97	0.304		
	Total	30.000	99			
Period of Holding	Between Groups	1.408	2	0.704	1.829	0.166
	Within Groups	37.342	97	0.385		
	Total	38.750	99			
Risk Level	Between Groups	0.465	2	0.233	0.468	0.627
	Within Groups	48.175	97	0.497		
	Total	48.640	99			
Return on Investment	Between Groups	4.083	2	2.041	2.928	0.058**
	Within Groups	67.627	97	0.697		
	Total	71.710	99			
Tax Benefit	Between Groups	0.464	2	0.232	0.199	0.820
	Within Groups	113.296	97	1.168		
	Total	113.760	99			
Company size & Reputation	Between Groups	3.223	2	1.611	1.647	0.198
	Within Groups	94.887	97	0.978		
	Total	98.110	99			
Liquidity	Between Groups	1.077	2	0.539	0.752	0.474
	Within Groups	69.433	97	0.716		
	Total	70.510	99			
Market Trend	Between Groups	2.001	2	1.001	1.383	0.256
	Within Groups	70.189	97	0.724		
	Total	72.190	99			
Government Policies	Between Groups	0.673	2	0.337	0.306	0.737
	Within Groups	106.717	97	1.100		
	Total	107.390	99			
Inflation	Between Groups	13.623	2	6.812	6.559	0.002*
	Within Groups	100.737	97	1.039		
	Total	114.360	99			

*Significant at 1% , **Significant at 5%.

Table 5. Mean Rank and Test Statistics for Age Group and Reason to Invest in Stock Markets

Investment Objectives	Age Group	N	Mean Rank	H Test	Sig.
	Young age group	28	44.79	3.296	0.196
	Middle age group	55	54.98		
	Old age group	17	45.41		
	Total	100			

Table 6. Test of Significance Between Age of Investors and the Proportion of Investments made in the Stock Market (ANOVA Results for Age and Proportion of Investments)

Groups	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.929	2	1.964	3.903	0.023**
Within Groups	48.821	97	0.503		
Total	52.750	99			

**Significant at the 5% level

Table 7. Multiple Comparison Table

(I) Age Group	(J) Age Group	Mean Difference (I - J)	Std. Error	Sig.
Young age group	Middle age group	0 -.240	0.165	0.315
	Old age group	-0.609	0.218	0.017**
Middle age group	Young age group	0.240	0.165	0.315
	Old age group	-0.369	0.197	0.152
Old age group	Young age group	0.609	0.218	0.017**
	Middle age group	0.369	0.197	0.152

** The mean difference is significant at the 5% level.

investments made in the stock market varied with the age of the investors (H05). The results are summarized in the Tables 6 and 7.

The Table 6 shows the results based on analysis of difference between proportion of investment made by investors and the age of the investors. There is a significant difference between age of the investors and the proportion of investments made in the stock market. Since the p - value $0.023 < 0.05$, the difference is significant at the 5% level, which indicates that there is a significant difference between the three age groups of investors with regard to the proportion of investments made in the stock markets. To understand more specifically about which age group of investors was influenced with respect to the proportion of investments made in the stock market, the post-hoc test was applied. The results of the Turkey post- hoc test are presented in the Table 7.

From the Table 7, it can be inferred that there is a significant difference in the proportion of investments made by the young and old age group of investors ($p = 0.017$). However, there is no significant difference between the middle and young age group of investors and also middle and old age group of investors respectively ($p = 0.315$, $p = 0.152$) in terms of proportion of investments made in the stock market. Specifically, there is much difference in the experience of the young and old age group of investors. Hence, there is a statistically significant difference between age groups as determined by one-way ANOVA ($F = 3.903$, $p = 0.023$). The H05 is rejected, since the Tukey post-hoc test reveals that the proportion of investments made by the investors in the stock market is statistically significant between the young and old age group of investors.

Findings

The paper brings forth certain peculiar characteristics of investors residing in Puducherry with regards to age. The results of the study are summarized below:

- From the difference between age of the investors and the saving objectives, the results revealed that young, middle, and old age group of investors differed in their saving objectives. Old age group of investors always preferred to save their investable surplus for their retirement benefits.
- The difference between the experience levels in investment and the age of the investors is statistically

significant at the 1% level, indicating a significant difference between them. Using the post-hoc test, the p-value is 0.000, which reveals the difference between the young and old age groups of investors based on their experience level. The difference level is highly significant as the p -value is less than 0.05.

➡ Most of the investors, before investing their hard earned investable surplus into the stock market, focus on return on investment and inflation as the important factors before making their investments.

➡ There is no significant difference between age of the investors and the objective of investment in the stock market.

➡ As compared to the young and middle aged investors, the old and young differed in their proportion of investments made in the stock market.

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Implications

The study analyzed the differences between the demographic variable, that is, age of investors towards various aspects of stock market investments, that is, saving objective, experience, factors affecting the selection of investment objective, and proportion of investment. The results showed that the investments made by the investors in the stock market differed with their personal characteristics. Specifically, the age of the investors played a vital role in behavioral finance, which led to the inference that the investors' demographic variables influence the investment behavior of every individual. However, for analyzing the investors' behavior other than stock market investments, special focus needs to be placed on the investors' behavior, both psychological as well as emotional.

Concluding Remarks

The objective of the study was to provide evidence on the difference between different age groups of investors and their behaviour towards stock market investments. The results of the study prove that investors' financial behaviour - in terms of making investments in the stock market - differed with respect to their age. The H test found that there is a significant difference between age and saving objectives; however, it showed an insignificant difference between different age groups of investors and their objective of investing and the factors affecting the selection of investment in the stock market. With regards to the difference between age and experience and proportion of investments, the study found that there existed a significant difference between them. Overall, the study found that there exists a significant difference between age and general behaviour of the investors towards stock market investments. In particular, young and old age group of investors differed significantly in their behaviour towards investments in the stock market.

Limitations of the Study and Scope for Further Research

The sample size for the present study was limited to 100 respondents only. The study was confined to the investors in Puducherry region. Hence, the results cannot be generalized for investors across India. Further studies may be extended by concentrating on other regions in India. The study was conducted by considering 'age' as the variable to analyze the investment behaviour of the respondents. However, the results may vary if the study is extended using other demographic variables, that is, gender, educational levels, occupation, and so forth.

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