Are Professional and Individual Investors Equally Prone to Disposition Effect? Evidence from Indian Stock Market

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Abstract. *Financial theory has identified the tendency of investors to hold losing investments too long and sell winning ones too soon. This tendency was denominated the disposition effect by Shefrin and Statman (1985). This research provides evidence of the disposition effect on the Indian stock market, by studying a unique database that consists on trading records of 165 individual investors and 130 professional investors. First, we identify their investing performance by reporting the subsequent return of stocks they sold versus stocks they purchased. Second, we determine to what extent Indian investors are disposed to holding poorly performing stocks (''losers'') while selling ''winners'' (i.e., the disposition effect). Finally, we compare our findings for individual investors with professional investors. The preference for realizing gains to losses was observed for both individual and professional investors. We also found that professional investors are less prone to the disposition effect than individual investors. Also, the lower participation of females in the study is an indication that in Indian stock markets women are less exposed to stock markets.*

Keyword: *Disposition effect, professional investors, Individual in vectors, round trips, winning stocks, losing stocks.*

Finance theory implies that investors should base portfolio decisions on expectations of future stock price movements rather than past stock price movements. They should not show a preference for selling either losing or winning investments. However, behavioral research suggests that investors may not act in this way when it comes to selling stocks. Researchers call this the disposition effect.

The disposition effect is the tendency to sell assets that have gained value and hold onto assets that have lost value. Say an investor held one share in his portfolio. If the investor believed that the share was going to appreciate in price then we would think the share would be retained. If the investor believed that the share was going to depreciate in price then we would think the share would be sold. From this it can be seen that the point from which the investor should make sell decisions is the current share price. However, the disposition effect arises from the fact that investors don't measure their expected gains and losses from the current price, but rather actual gains and losses from some reference point, typically historic purchase price.

This paper is organized as follows: first we introduce the nature of the disposition effect as well as some literature on previous studies. Then we present the database that was used in this study. It follows a presentation of the methodology and a discussion of the empirical results. We conclude with a summary of the paper and some suggestions.

LITERATURE REVIEW

The disposition effect is the tendency of investors to sell winning stocks too early and to hold losing stocks too long. It was first analyzed by Shefrin and Statman (1985) and confirmed on individual data by Odean (1998), among others. Experimental evidence of the disposition effect has also been obtained in the first place by Weber and Camerer (1998). Selling winning stocks too early can refer to self-control problems, to aversion to regret or to

a belief in mean reversion of prices. It also suggests a possible time-inconsistency in successive decisions. It is as if investors were changing their horizon of investment, depending on the evolution of stock prices and such investors are usually called disposition investors. The effect was first noticed by Shefrin and Statman (1985), and subsequently documented for investors in various contexts, including the USA (Odean, 1998), Finland (Grinblatt and Keloharju, 2001; Seru et al, 2009), Israel (Shapira and Venezia, 2001), China (Feng and Seasholes, 2005; Shumway and Wu, 2006), Japan (Misumi, Shumway, and Takahashi, 2007, Taiwan (Barber et al, 2007). It has been noticed among professional market makers and mutual fund managers. Weber and Camerer (1998) carried out experiments to document disposition effects in the subjects. Dhar and Zu (2006) attempted to explain the cross sectional differences in disposition effect exhibited by distinct investors.

Traditionally, it was believed that investors are rational agents who maximize expected utility defined on final wealth. But, psychologists and some economists led by Daniel Kahneman and Amos Tversky proposed that investors do not always behave as expected utility maximisers.

Individual investors are the investors unduly influenced by familiarity and salience (Barber and Odean, 2002; Grullon, Kanatas and Weston, 2003; Huberman, 2001), vulnerable to errors in assessing risk (Benartzi and Thaler, 1999), slow to incorporate news into prices (Cohen, Gompers and Vuolteenaho, 2002), and otherwise prone to errors. If these investors affect asset prices, their trading should be responsible for some market anomalies. Jackson (2003) found that individual investor trades follow persistent, systematic patterns. However, they are not successful in predicting future returns. Kumar and Lee (2006) also found correlation in the trades of individuals. They report that individual investor trading explains return co-movements for some stocks, particularly smaller, lower priced stocks with high individual investor ownership.

A number of recent studies have examined investor trading decisions. Odean (1998) found that, as predicted by Shefrin and Statman (1985), individual investors exhibit a disposition effect—investors tend to sell their winning stocks and hold on to their losers.

The review of the previous studies reveals that most of the studies have been done on individual investors because they are normally considered to be the most uninformed and unskilled economic agents. They seem to be the real-world counterparts to the noise traders described by behavioral models (see, for example, De Long et al., 1990; Shleifer and Vishny, 1997, among others).

Individual investors have been modeled or documented to behave in many naïve ways. For example, they may under-react or over-react to news; they may insufficiently or naïvely diversify their portfolios; they may hold too many local or domestic equities; they may make investment decisions based on familiarity instead of utility maximization; and confusion concerning stock tickers may even lead them to respond to news incorrectly. In short, individual investors seem to be making a variety of mistakes that have significant economic consequences. Therefore, they are suitable subjects for investigating potential learning behavior. If they are able to learn rationally, it seems plausible to argue that other more sophisticated economic agents should be able to learn as well.

There are several reasons based on existing research to expect that we are born to exhibit a disposition effect. First, a recent gene association study by Zhong et al. (2009) identified the specific genes that affect the concavity and convexity of the prospect theory value function in the gain and loss domains. Second, neuroimaging studies report evidence on the neural basis of loss aversion and the disposition effect (Frydman, Barberis, Camerer, Bossaerts, and Rangel, 2011). Finally, the evidence, discussed above, of significant loss aversion and framing effects in animals that are genetically close to humans also suggests that

we are born with the disposition effect (e.g., Chen, Lakshminarayanan, and Santos, 2006; Lakshminarayanan et al., 2011).

OBJECTIVES AND METHOD

Objectives of the Study:

Review of the existing literature suggests that most of the studies have been conducted on individual investors. In this study, we conduct two sets of empirical tests on both professional as well as individual investors. First, we identify their investing performance by reporting the subsequent return of stocks they sold versus stocks they purchased. Second, we determine to what extent Indian investors are disposed to holding poorly performing stocks (''losers'') while selling ''winners'' (i.e., the disposition effect). Finally, we compare our findings for individual investors with professional investors.

Source of Data:

The National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE) are the two most significant stock exchanges in India and between them are responsible for the vast majority of share transactions. The NSE's key index is the S&P CNX Nifty, known as the NSE NIFTY (National Stock Exchange Fifty), an index of fifty major stocks weighted by market capitalization. The National Stock Exchange of India was set up by Government of India on the recommendation of Pherwani Committee in 1991. NSE is mutually owned by a set of leading financial institutions, banks, insurance companies and other financial intermediaries in India but its ownership and management operate as separate entities. NSE is the third largest stock exchange in the world in terms of the number of trades in equities. It is the second fastest growing stock exchange in the world with a recorded growth of 16.6%.

Our data for analysis of disposition effect came from a leading brokerage house in India. Due to confidential reasons we are not disclosing the name of the brokerage house. For proving disposition effect in the Indian stock market we have restricted our study to the 50 stocks that comprise the Nifty index and also we have considered the data which involved single round trips.

The distinguishing factor between individual and professional investor in this case was that anyone seeking professional portfolio management services from the brokerage firm was tagged as professional investor. Our sample period is from Jan 01, 2011 to December 31, 2011. For both individual and professional investors, we have data on the number of years that the investor has held the account, the investor's trading activities (stocks bought and sold), the size of the investor's brokerage account, and the branch (city) in which the account is located. A total of 1180 transactions were considered which translated to 590 round trips. Out of this, 330 round trips were made by individual investors and the remaining 260 by professional investors.

Profiles of Investors:

The data collected from the brokerage house comprised both individual and professional investors. A total of 295 investors are considered for study on disposition effect. Out of this 165 are individual investors and 130 are professional investors. Professional investors are those investors who solicit the assistance of professional portfolio and money managers (PMMs) who also act as brokers. Most of these PMMs are not members of the National Stock Exchange (NSE), so they execute their transactions through an exchange member, (usually a large bank or other financial institution).

We consider the following hypothesis:

***H01*:** There is no difference between the average duration of winning and losing roundtrips for individual investors.

***H02*:** There is no difference between the average duration of winning and losing roundtrips for professional investors.

RESEARCH METHOD

Calculation of Roundtrip duration

Consider an investor buying a certain quantity of stock on a particular day at a particular price. After a few days of trading the investor decides to sell the stocks he bought earlier. This complete transaction is termed as a round-trip which basically means buying and selling of a stock. In our analysis we have included the data having complete round-trips and not the partial ones. By complete round-trips we mean if 'A' buys 100 quantity of stock on a particular day then for him a round-trip will qualify when he sells the entire 100 quantity. The round-trips can be easily calculated by below formula:

D = (Sell Date) – (Buy Date)

Where, D is the Round-trip duration

Identification of Winners/Losers

The next step to prove disposition effect is to figure out which stocks are the winners and which ones are the losers. Once those are identified we can compare the round trip duration for both winners and losers.

We identify a winner stock by the mechanism that if the stock has gained in value from the price it was bought at then it is termed as a winner. For example, if investor A buys a share X at Rs. 100 and after some days the price of X increases to 120 then X will be termed as winner. Similarly if investor A buys a share X at Rs. 100 and after some days the price of X decreases to 80 then X will be termed as loser. Thus a loser will be defined as the stock which has lost value from the price it was bought at.

Stock

- Winner, if $X_i < X_s$
- Loser, if $X_i > X_s$

Where,

X_i = Initial price or buy price

X_s = Selling price

Test of Disposition Effect

To test the disposition effect, we compared the duration of losing round trips (round trips are transactions where there was a buy and a subsequent sale so that at the end of the round trip the client had a zero position in the security) to those of winning round trips. If returns are not negatively correlated over time, and if there are no tax considerations, shorter

duration of winning round trips compared to losing round trips would constitute evidence for the disposition effect. For each investor we have considered one winning round trip and one losing round trip. This will give us a better way of comparison where the same sets of individuals are involved in both form of round trips.

ANALYSIS AND INTERPRETATION

Gender of Respondents

The study has included both males as well females though the proportion of female investors is less than that of male investors. For individual investors, 88.4% investors were male while 11.52% investors were females. For professional investors, there were 90.77% male investors while females were 9.23%. The less participation of females in the study is an indication that in Indian stock markets women are less exposed to stock markets.

S. No.	Gender	Frequency	Percent	Cumulative Percent
1	Male	146	88.48%	88.48%
2	Female	19	11.52%	100.00%
	Total	165	100.00%	

Table 1: Gender distribution of Individual Investors

S. No.	Gender	Frequency	Percent	Cumulative Percent
1	Male	118	90.77%	90.77%
2	Female	12	9.23%	100.00%
	Total	130	100.00%	

Table 2: Gender distribution of Professional Investors

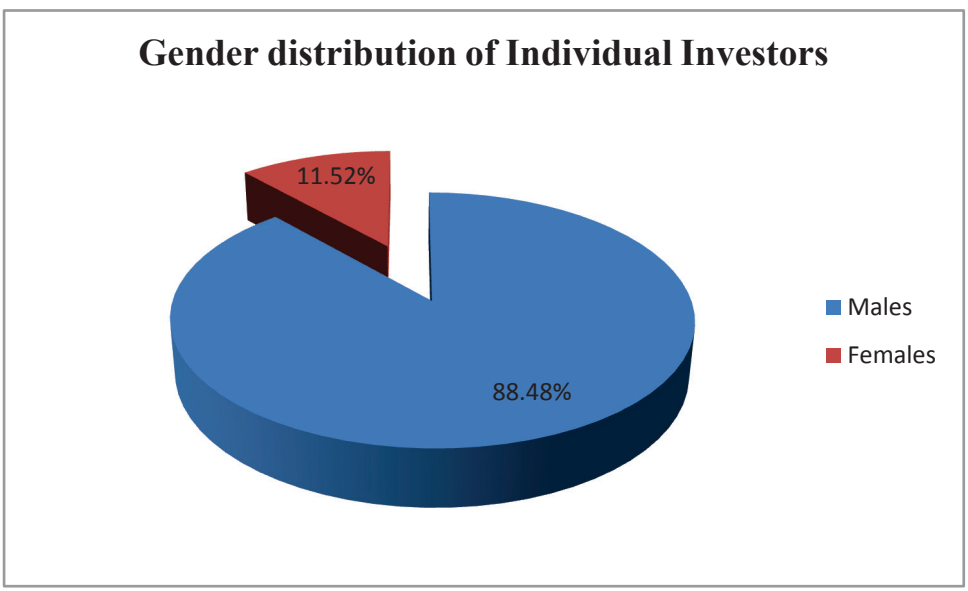

Figure 1: Gender distribution of Individual Investors

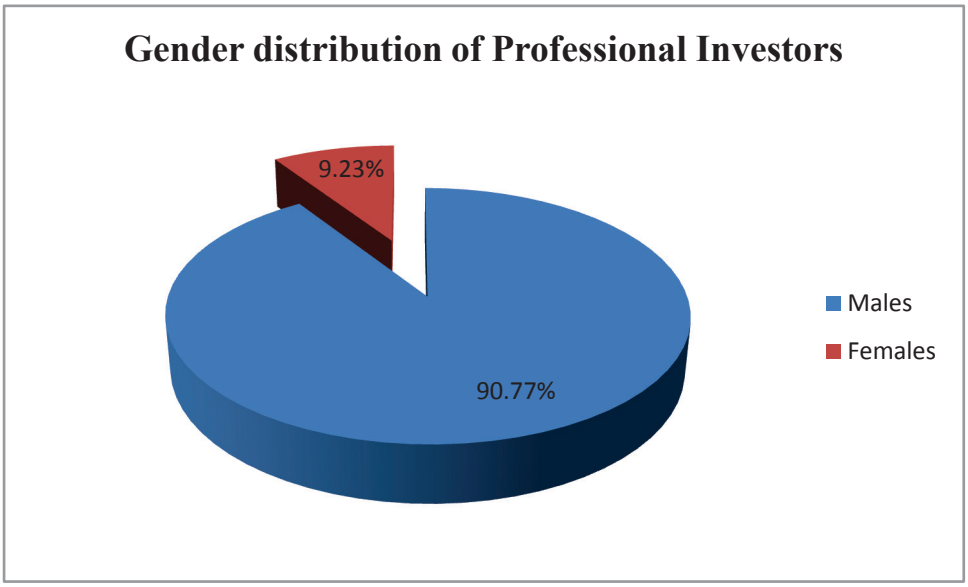

Figure 2: Gender distribution of Professional Investors

Age

The age of investors was divided in 4 categories. These were labeled as 18-30, 30-40, 40-60 and more than 60 years. For both individual and professional investors the maximum frequency was in the 30-40 years age group.

S. No.	Age	Frequency	Percent	Cumulative Percent
1	18-30	36	21.82%	21.82%
2	30-40	69	41.82%	63.64%
3	40-60	46	27.88%	91.52%
4	> 60	14	8.48%	100.00%
	Total	165	100.00%	

Table 3: Age distribution of Individual Investors

S. No.	Age	Frequency	Percent	Cumulative Percent
1	18-30	8	6.15%	6.15%
2	30-40	64	49.23%	55.38%
3	40-60	43	33.08%	88.46%
4	> 60	15	11.54%	100.00%
	Total	130	100.00%	

Table 4: Age distribution of Professional Investors

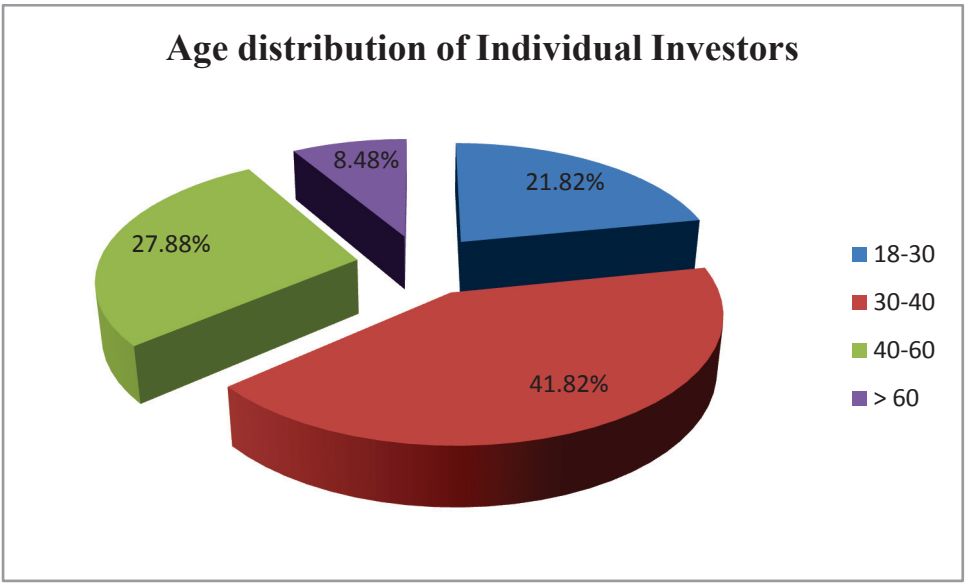

Figure 3: Age distribution of Individual Investors

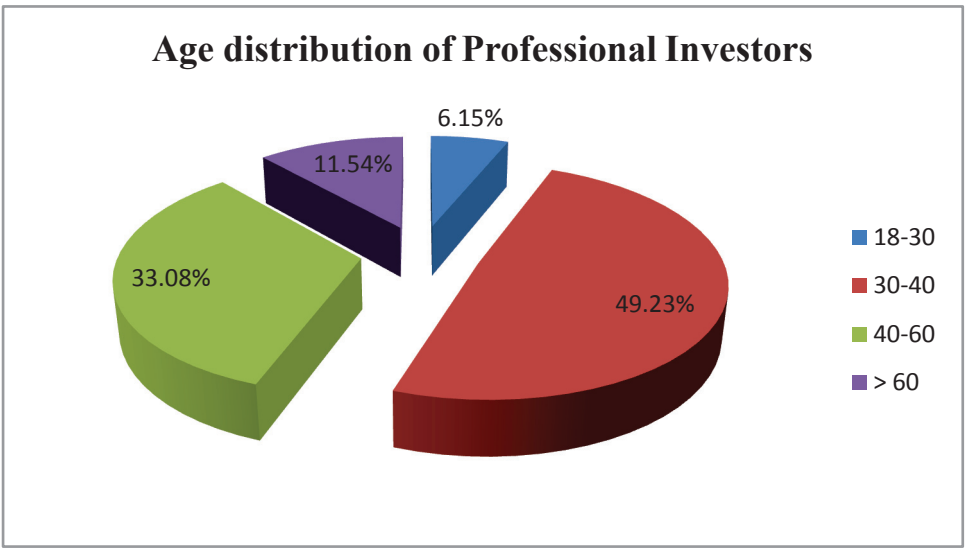

Figure 4: Age distribution of Professional Investors

Education

Nearly half of the individual investors were having a bachelor degree as compared to professional investors where most of them were master degree holders. Also, a decent proportion of individual investors had studied till the high school level only. This is an important observation because this lack of education can be a driver of a lot of behavioral bias.

S. No.	Education	Frequency	Percent	Cumulative Percent
1	High School	33	20.00%	20.00%
2	Diploma	21	12.73%	32.73%
3	Bachelor	73	44.24%	76.97%
4	Master	29	17.58%	94.55%
5	Doctorate	9	5.45%	100.00%
	Total	165	100%	

Table 5: Education Details of Individual Investors

S. No.	Education	Frequency	Percent	Cumulative Percent
1	High School	12	9.23%	9.23%
2	Diploma	21	16.15%	25.38%
3	Bachelor	41	31.54%	56.92%
4	Master	54	41.54%	98.46%
5	Doctorate	2	1.54%	100.00%
	Total	130	100%	

Table 6: Education Details of Professional Investors

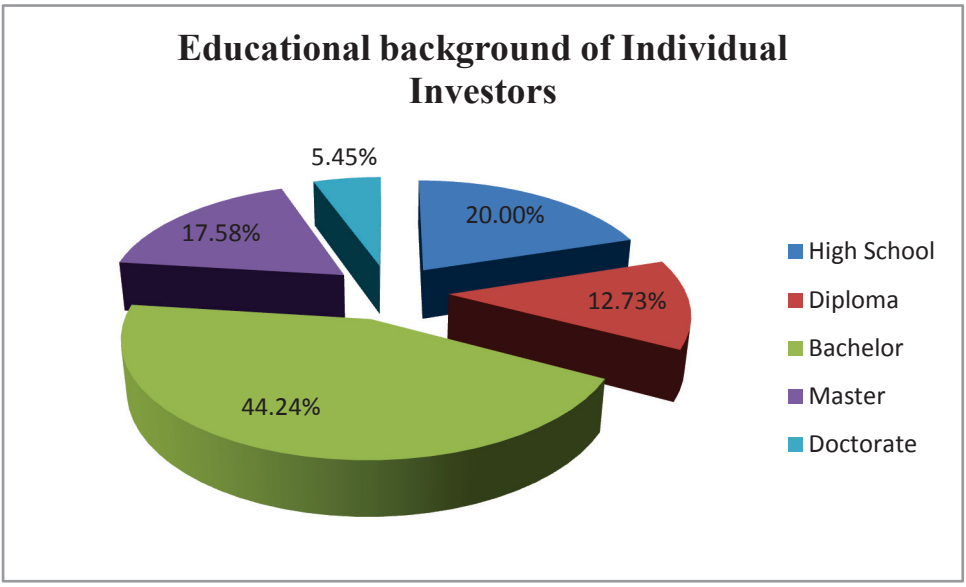

Figure 5: Educational background of Individual Investors

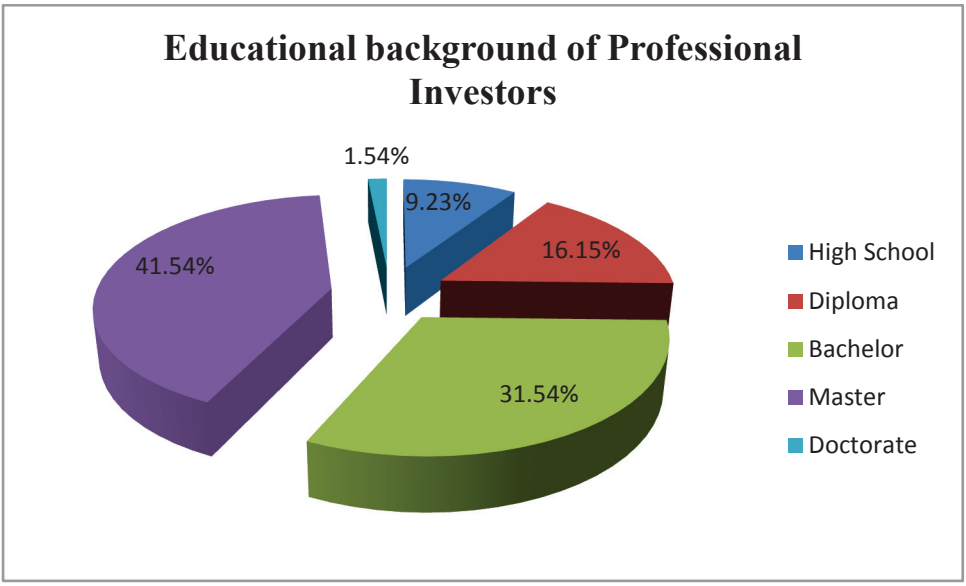

Figure 6: Educational background of Professional Investors

Employment

For individual investors, the population is scattered among all the employment sectors with only 25.45% of the investors working for the financial sector. On the other hand almost half of the professional investors work in the financial sector. It is interesting to note that a good proportion of individual investors are from the IT sector. This may be due to the easy access to e-trading platforms and good disposable income.

S. No.	Employment	Frequency	Percent	Cumulative Percent
1	Financial Sector	42	25.45%	25.45%
2	Business	22	13.33%	38.79%
3	Education	17	10.30%	49.09%
4	Real Estate & Construction	12	7.27%	56.36%
5	Government Job	14	8.48%	64.85%
6	IT	26	15.76%	80.61%
7	Others	32	19.39%	100.00%
	Total	165	100%	

Table 7: Employment details of Individual Investors

S. No.	Employment	Frequency	Percent	Cumulative Percent
1	Financial Sector	62	47.69%	47.69%
2	Business	11	8.46%	56.15%
3	Education	4	3.08%	59.23%
4	Real Estate & Construction	10	7.69%	66.92%
5	Government Job	3	2.31%	69.23%
6	IT	12	9.23%	78.46%
7	Others	28	21.54%	100.00%
	Total	130	100%	

Table 8: Employment details of Professional Investors

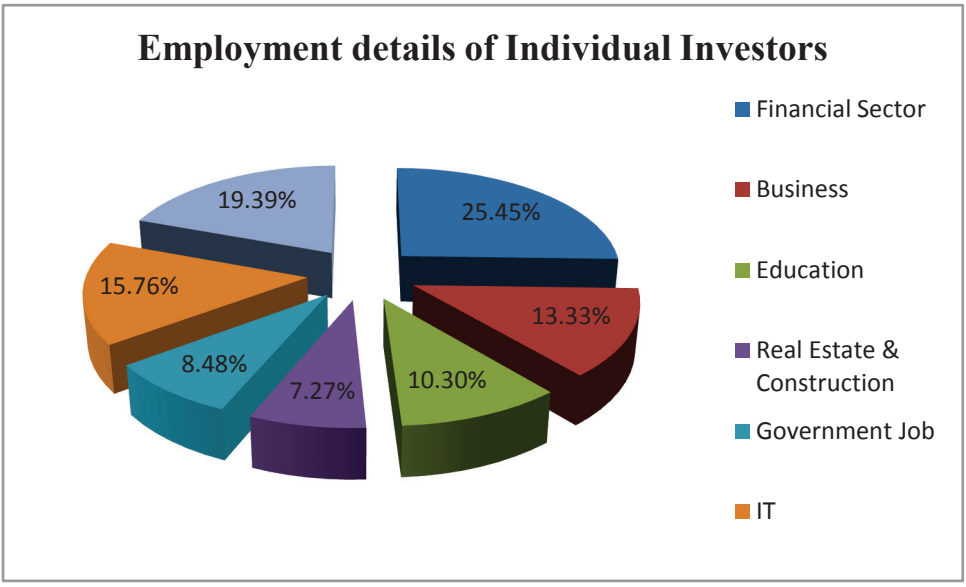

Figure 7: Employment details of Individual Investors

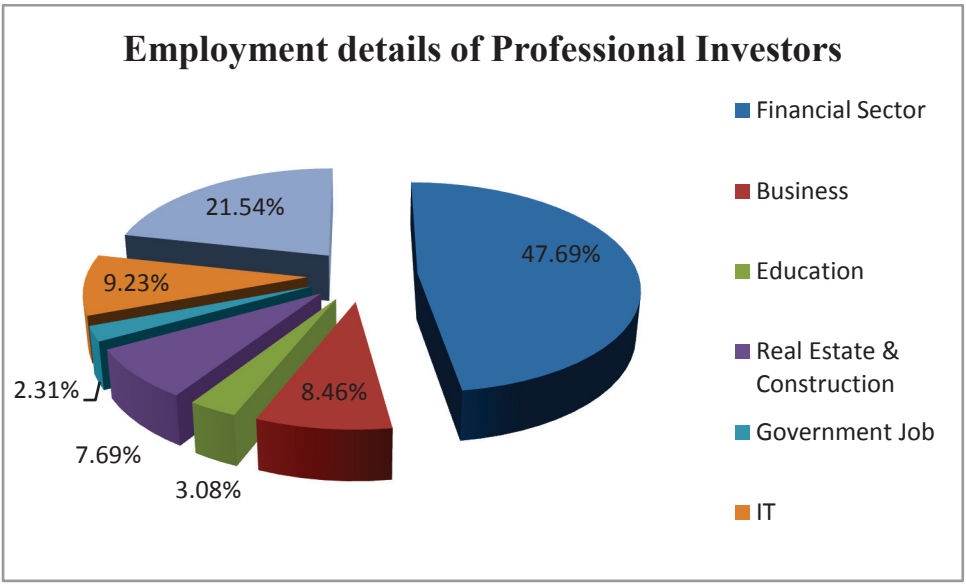

Figure 8: Employment details of Professional Investors

Investing Experience

There is an obvious difference in terms of investing experience for individual and professional investors. Around 60% of individual investors have less than 4 years of investing experience unlike professional investors where more than 60% investors have 5 or more years of investing experience.

S. No.	Investing Experience	Frequency	Percent	Cumulative Percent
1	< 1 year	14	8.48%	8.48%
2	1-2 Years	36	21.82%	30.30%
3	3-4 Years	53	32.12%	62.42%
4	5-6 Years	41	24.85%	87.27%
5	6 Years and above	21	12.73%	100.00%
	Total	165	100%	

Table 9: Investing experience of Individual Investors

S. No.	Investing Experience	Frequency	Percent	Cumulative Percent
1	< 1 year	5	3.85%	3.85%
2	1-2 Years	8	6.15%	10.00%
3	3-4 Years	28	21.54%	31.54%
4	5-6 Years	47	36.15%	67.69%
5	6 Years and above	42	32.31%	100.00%
	Total	130	100%	

Table 10: Investing experience of Professional Investors

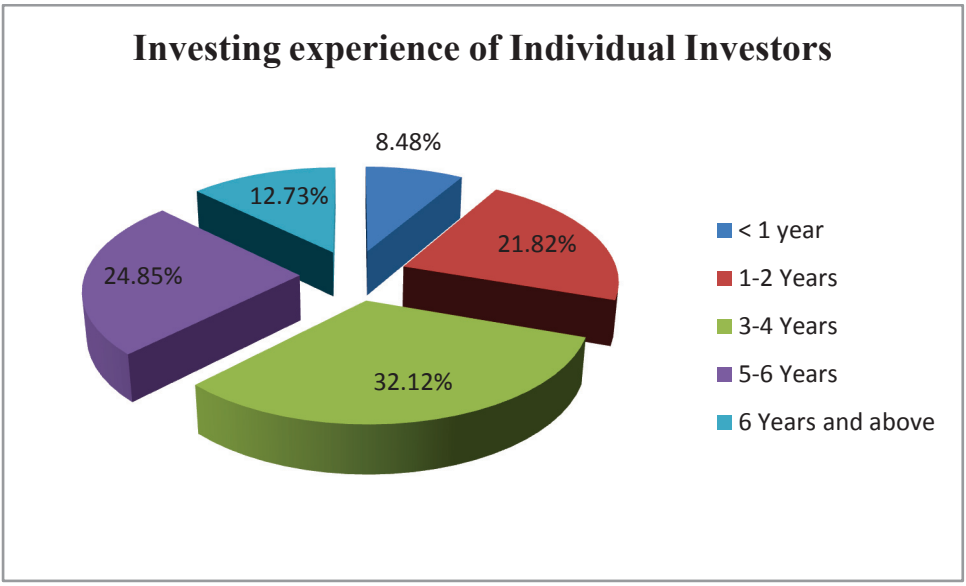

Figure 9: Investing experience of Individual Investors

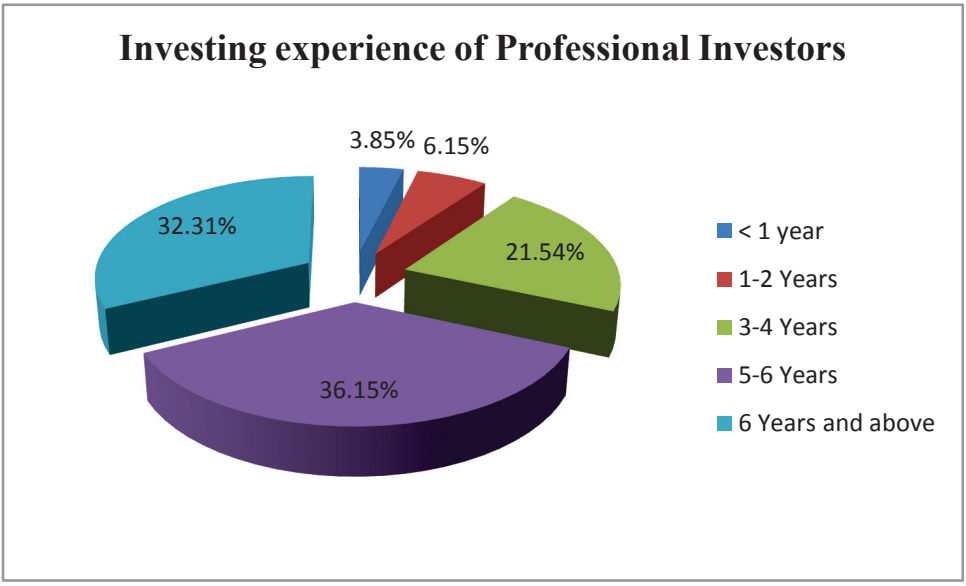

Figure 10: Investing experience of Professional Investors

Hypothesis Testing

The means and standard deviations of the duration of all round trips (winners and losers) of individual investors are presented below. The average duration of a losing round trip is 70.55 days for the professional investors, and 89.67 for individual investors and the average duration of winning round trip is 52.07 days and 41.28 days for professional and individual investors respectively. The average duration of losers is significantly longer than that of winners for both groups, as suggested by the disposition effect.

Hypothesis	t-Value	Significance (2-tailed)	Result
H01	-10.505	0.000	Rejected
H02	-3.336	0.001	Rejected

Table 11: Hypothesis test results

A t-test was applied between the losing and winning round trips of both professional and individual investors. The null hypothesis in both the cases is rejected suggesting that there is difference between the average duration of winning and losing round trips for both individual and professional investors. Thus, both individual and professional investors exhibit disposition effect in the Indian stock market.

We also observe that the average duration of the winning round trips is longer while the duration of the losing round trips is shorter for professional investors in comparison with the individual investors. Therefore, the disposition effect, defined as the difference between the average duration of a losing round trip and a winning round trip, is smaller for professional investors.

Thus, professional investors are less prone to disposition effect as compared to individual investors.

CONCLUSION AND SUGGESTIONS:

We conclude that:

1. The lower participation of females in the study is an indication that in Indian stock markets women are less exposed to stock markets.
2. Most of the trading was observed in the investors of the age group of 30-40 years.
3. Most of the individual investors are less educated than professional investors.
4. Most of the professional investors belong to the financial sector while decent number of individual investors came from the IT sector.

Finally, we find that trading experience seems to help reduce the disposition effect, which supports other findings showing that experience can eliminate some market anomalies (List 2002). Professional investors are found to have more trading experience than individual investors in the Indian stock market.

Our paper shows that certain demographic characteristics that correspond to lower sophistication have higher disposition effect. We show that "low-income" and "non-professional" investors have the highest disposition effect among all investors. It is particularly unfortunate as the changes in investment return may have the greatest adverse impact on them.

The study also shows that both individual and professional investors exhibit disposition Effect, but professional investors are less prone to disposition effect as compared to individual investors. The average duration of losing round trips for individual investors is (89.67) much longer than those of professional investors (70.55).

However, trading frequently has also been shown to be hazardous to investors' wealth (Barber and Odean, 2002), indicating that it is rather costly to alleviate behavioral bias through trading. Brokerage firms and investment clubs should use newsletters and reminders to educate investors of such biases and help them make better investments.

We recommend policy makers and non-profit organizations should try to make investors aware of such biases, especially those at the lower income levels and engaged in non-professional occupations. Such advocates can help these investors pay closer attention to loser stocks in their portfolio, make them aware of tax benefits of realizing losers toward year-end and motivate them to switch from direct investment to other investment vehicles such as mutual funds.

Our findings are also valuable to various brokerage firms, which dedicate themselves to helping investors make better investments. We believe that the brokerage firms will be more profitable if their clients enjoy higher rate of return in their investment for the long run. As a result, it is in the brokerage firms' own interests to better inform their clients of the existence of the disposition bias and its implications. With demographic information, the brokerage firms could also effectively target "low-income" and "non-professional" clients who are most likely to suffer from the disposition effect.

It is possible to minimize the disposition effect by using a concept called hedonic framing to change one's mental approach. For example, in situations where you have a choice of thinking of something as one large gain or as a number of smaller gains (such as finding Rs.100 versus finding a Rs.50 bill from two places), thinking of the latter can maximize the amount of positive utility. Finally, for situations where you have a choice of thinking as something as one large loss with a smaller gain or a situation where you have a smaller loss (-Rs.100 and +Rs.55, versus –Rs.45), it would be best to try to frame the situation as separate gains and losses. Trying these methods of framing your thoughts should make the experience more positive and if used properly, it can help minimize the dispositional effect.

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APPENDICES

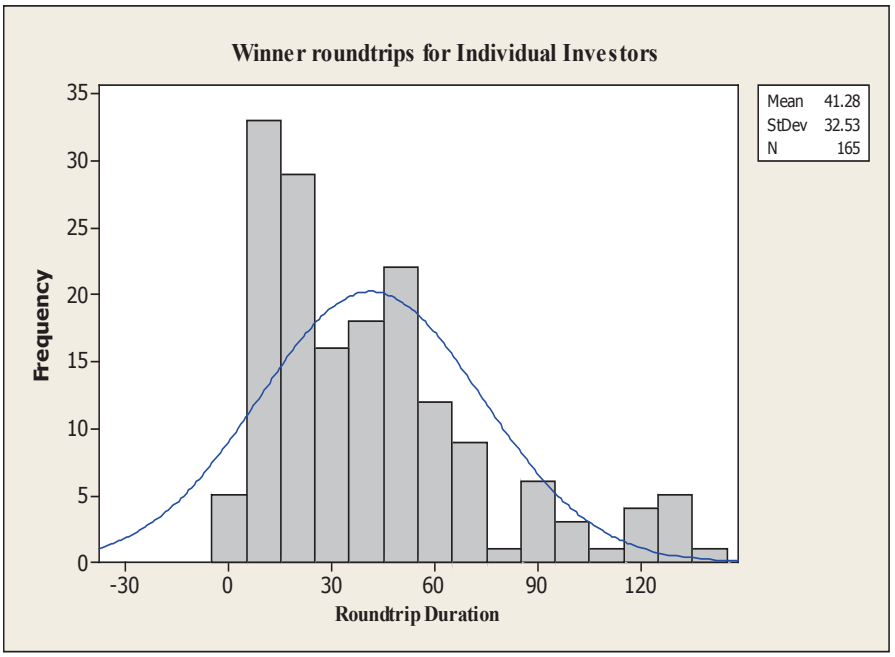

Figure 11: Winner roundtrips for Individual Investors

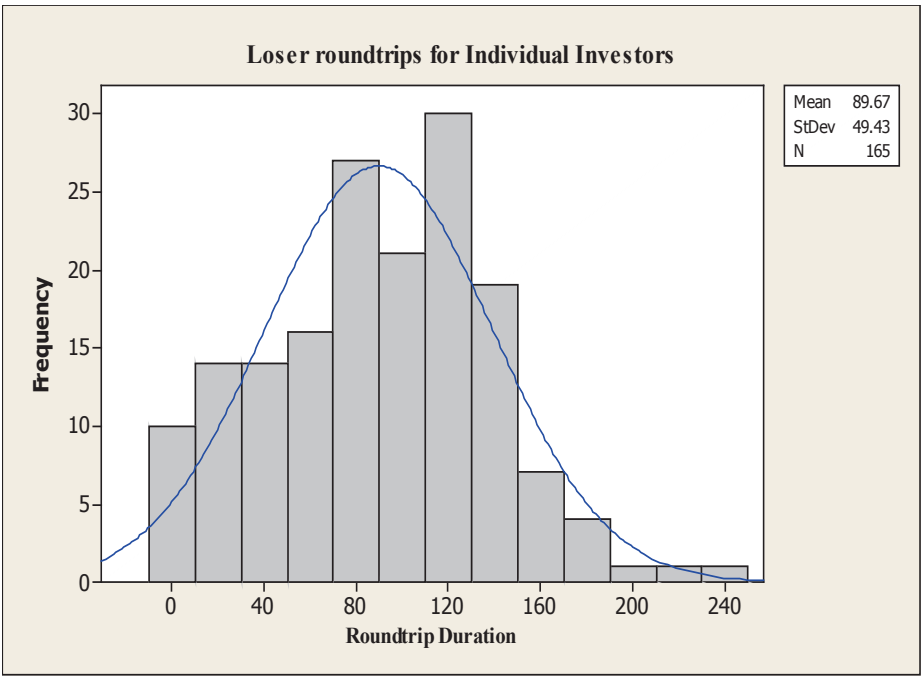

Figure 12: Loser Round Trips for Individual investors

Group Statistics

	Stock	N	Mean	Std. Deviation	Std. Error Mean
Roundtrip	Winner	165	41.28	32.529	2.532
	Loser	165	89.67	49.433	3.848

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Roundtrip	Equal variances assumed	30.090	.000	-10.505	328	.000	-48.394	4.607	-57.457	-39.331
	Equal variances not assumed			-10.505	283.606	.000	-48.394	4.607	-57.462	-39.326

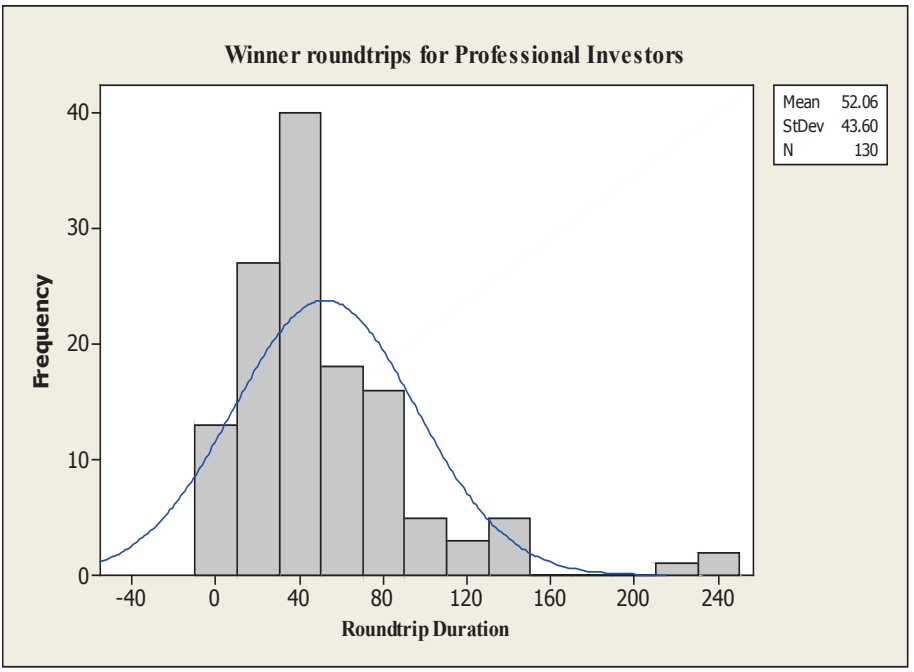

Figure 11: Winner roundtrips for Professional Investors

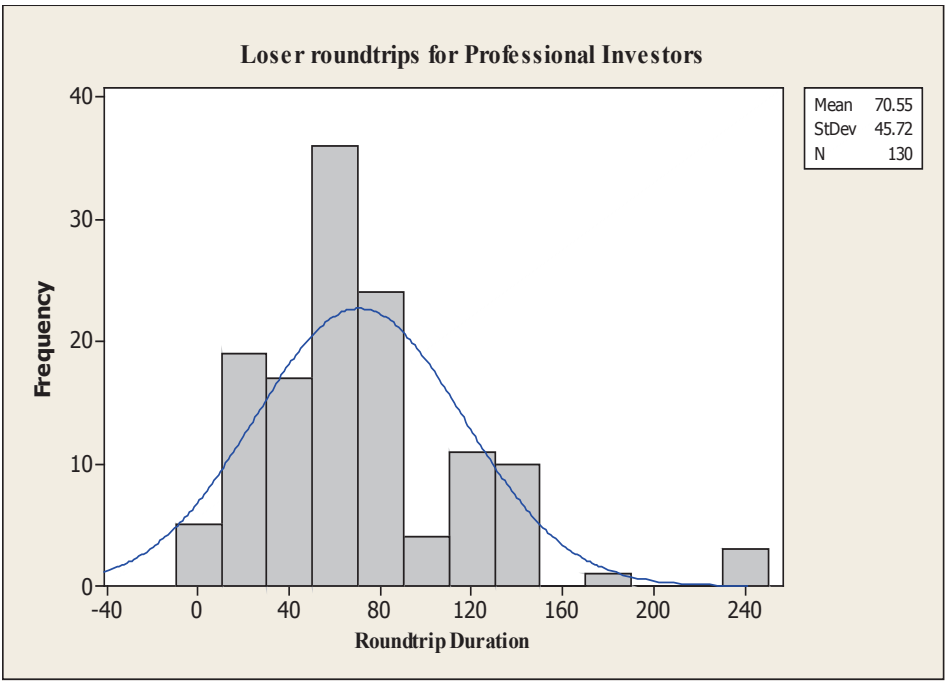

Figure 12: Loser roundtrips for Professional Investors

Group Statistics

	Stocks	N	Mean	Std. Deviation	Std. Error Mean
Roundtrip	Winner	130	52.06	43.598	3.824
	Loser	130	70.55	45.725	4.010

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Roundtrip	Equal variances assumed	.379	.538	-3.336	258	.001	-18.485	5.541	-29.396	-7.573
	Equal variances not assumed			-3.336	257.417	.001	-18.485	5.541	-29.396	-7.573