Does the annual income earned influence the decision-making in the Indian Secondary equity market?

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Abstract

The annual income earned plays a very important role in stock investing as it influences several dimensions of the investment process. The main goal of this research was to examine the role of the annual income earned by the secondary equity investors in the decision- making process. The research is exploratory in nature where a questionnaire survey was conducted on a sample of 436 secondary equity investors residing in the Chennai city of India. The data was analysed using quantitative techniques like ANOVA, Multinomial Logistic Regression, Discriminant and Cross Tabulation. The ANOVA results revealed that except in economy analysis and company analysis, the investors belonging to the various income groups differed in all the other decision-making techniques. When divided in terms of gender and age as well, the results were significant. The Multinomial logistic regression analysis resulted in a robust model which showed that industry analysis, technical analysis, gender*advocate recommendation and gender*equity investment knowledge are significant predictors of the annual income. The Discriminant model developed to predict the returns earned in equity investments showed that only the industry analysis and company analysis have a positive relationship with the equity returns. The demographic and financial profile of the high- and low-income investors were examined in the Cross-tabulation analysis. The main outcomes of the study are (i) older investors are less likely to belong to the low income group compared to the average income group; (ii) the low-income investors are likely to be male investors with decreased equity investment knowledge; (iii) investors who employ industry analysis are more likely to belong to the high income group and those who employ technical analysis are less likely to belong to the high income group compared to the average income group and (iv) investors with more equity investment knowledge are more likely to belong to the high income group compared to the average income group. The results also show that adopting industry analysis and/or company analysis may lead to a higher probability of earning higher returns in the equity market whereas the adoption of economy analysis, technical analysis and/or advocate recommendation lead to lower returns. This study would guide investors and advisors to examine the direct and indirect influences of the income earned. Government bodies and investor associations need to focus on the low-income investors who are more vulnerable to financial blunders owing to their financial issues.

Keywords: Indian equity market, Decision making, Secondary equity market, Fundamental analysis; Technical analysis; Advocate recommendation

Does the annual income earned influence the decision-making in the Indian Secondary equity market?

According to the latest SEBI Investor survey report (2015), from a group of 5356 urban Indian investors, (i) 64.4% of the less than Rs. 20,000 monthly income group (ii) 50.2% of the Rs.20,000 to Rs. 50,000 monthly income group (iii) 70.3% of the top tier middle-income group who have monthly income levels ranging from Rs. 50,000 to Rs. 1,00,00 (iv) 51.6 % of the above Rs.1,00,000 monthly income group choose to invest in the equity market. Though the income levels and savings are high, the investment in the equity market is moderate owing to reasons like fear of safety (25.6%), inadequate information (21.3%), lack of expertise (15.6%), insufficient returns (15.4%), illiquidity (13.4%) and other reasons (8.6%).

In the investment scenario, the decision of stock selection is very important and complex. The pattern of the stock prices is not precise. Therefore, the investment decisions cannot be done easily by following a set of simple guidelines (Shen and Tzeng, 2015). It is important to understand the process of equity selection of the investors in terms of their understanding and reaction to the various economic and information factors and also the extent to which these factors influence their investment decision. This learning would help financial professionals, regulators, brokerage houses and investors themselves to adopt better and robust investment strategies (Chong and Lai, 2011).

Investors and finance professionals adopt multiple methods and tools to gain greater results of their decision making in financial investments (Qureshi et al., 2012; Brijlal, 2007). The investors' choice of decision-making tools has been changing over the years. In the 80s, around 70% employed fundamental analysis for stock selection (Firer, 1988). In the survey conducted in 2007, around 62% employed fundamental analysis owing to more investors adopting technical analysis or peer recommendations (Brijlal, 2007). The fundamental analysis comprising of economy, industry and company analysis and the technical analysis are the most predominantly used decision making tools (Qureshi et al., 2012; Brijlal, 2007). Fundamental analysis involves the complete analysis of important financial conditions like dividends and earnings as well as the overall equity market conditions which help to predict stock market trends. The main assumption here is that the operating conditions of any firm is reflected in the performance of its stocks. Technical analysis, on the other hand, watches out for repetitive patterns in stock prices such as herding, momentum, etc and as a result predicts future patterns (Lee et al., 2011). Fundamental analysis is adopted mostly for long term forecasting decisions whereas technical analysis would be for shorter time frames (Maditinos et al., 2006). Technical analysis is recommended for predicting turning points whereas fundamental analysis is recommended for forecasting trends (Lui and Mole, 1998). Advocate's recommendation (Nagy and Obenberger, 1994), which is decision making based on peer opinions like that of brokerage houses, stock brokers, friends or colleagues is also an important tool adopted by investors for equity selection in financial decision making (Chong and Lai, 2011; Brijlal, 2007).

This study is one of a kind which encompasses the several factors influenced by the annual income earned by the secondary equity investors, specifically the decision-making techniques adopted. The main hypotheses of the study are:

H1 The means (average values) of the decision-making techniques are the same for the secondary equity investors of all income groups and

H2 There is a significant impact of the annual income earned by the secondary equity investors on the decision-making techniques, gender, age, risk appetite, and equity investment knowledge.

In order to compare the means of the income groups, Analysis of Variance tests was used. In order to assess the influence of the annual income on the various factors, Multinomial Logistic regression was used. In addition, Discriminant analysis has been used to develop a robust discriminant model which predicts the returns earned in the secondary equity market. Cross-tabulation analysis has also been used to describe the high-income and the low-income investors.

Literature Review

Investment behavior is a systematic and direct consequence of the personal characteristics of the investor which include the demographic characteristics as well. The demographic variables of the investor influence what he/she does and also the way processes are viewed. The characteristics like investor age, gender and income significantly determine the investment process consistently (Lewellen et al., 1977).

The income earned is one of the important variables influencing the stock selection decision of equity investors (Bennet et al., 2011) and an important influencing factor of investors' competence (Chandra, 2009). The income level significantly influences the financial literacy level of investors (Bujan et al., 2016; De Clercq and Venter, 2009). The investors belonging to various income levels spend money to collect valuable investment information and are also more than ready to spend more as their financial status improves. (Lewellen et al., 1977). Income is also an important determinant of the risk-taking attitude of investors (Donkers et al., 2001)

Characteristics of the High-Income Investors

The decision to hold stocks depends on the income earned by the investors and high income suggests higher probability to invest in stock holdings (Shum and Faig, 2006). As the investors' income level increases their investment objective varies and is no longer restricted to dividend income alone. The high-income investors, until the age of 55 are not interested in additional income from their existing portfolios given the tax norms. But however, after retirement, the dividend income is preferred by the high-income investors. The high-income investors also take more risk (less risk averse) (Donkers et al., 2001), trade more frequently (Vissing-Jorgensen, 2002) owing to confidence in their competence (Chandra, 2009) and also trade in bigger denominations (Lewellen et al., 1977). The high-income investors usually have higher investment knowledge (Volpe et al., 2002) and higher financial literacy (Beal and Delpachitra, 2003; Kumar and Kasilingam, 2017; De Clercq and Venter, 2009) when compared to the lower income investors and also perceive themselves as more knowledgeable owing to longer experience in the stock market (Dorn and Huberman, 2005). They hold better diversified portfolios (Florentsen et al., 2019). The high-income investors have higher financial sophistication and hence tend to commit lesser financial mistakes. They are more confident to invest in riskier investments (Calvet et al., 2009). Hence the high-income investors have a higher fraction of risky assets, especially equity investments in their portfolio (Cohn et al., 1975; Riley and Chow, 1992). There is a significant relationship between the risk-taking ability and the income level of the investor (Geetha and Vimala, 2014). The non-investment income level has a positive influence on the risk-taking ability which indicates that the higher income investors are more risk tolerant (Sung and Hanna,

1996). The wealthier investors invest in riskier assets as they have better access to costly private information about the stocks' payoff. This is turn leads to an increased demand for information with the increase in wealth and thereby resulting in differences in the portfolio allocation between the two income groups. The access to information increases the returns which leads to increased stock holdings and higher Sharpe ratio on the portfolio as the wealth increases (Peress, 2004). The corporate stocks belonging to the high-income investors appreciate much faster than that belonging to the lower income investors. This variation is because the higher income investors invest in riskier stock investments (Yitzhaki, 1987). Hence most of them invest in mutual funds owing to higher risk-taking ability (Gupta and Sharma, 2016). Other studies like Velmurugan et al. (2015) however show that the high-income investors invest in safer investment avenues like bank fixed deposits and post office savings. The high-income investors also manage their finances more responsibly as they feel empowered to control their own financial destiny (Perry and Morris, 2005). These investors are more concerned about financial affairs because of the increased opportunities in terms of portfolio allocation and investment alternatives (Donkers and Van Soest, 1999). The investors' interest in financial instruments and also the following-up of information about the investments increase with the rise in income level (Islamoğlu et al., 2015). The high-income investors also give more attention to the disclosure of information, ownership and board structure of the investing firm and transparency of financial information in the stock market (Fu, 2006). The higher income investors are less susceptible to behavioral biases like mental accounting, representativeness, availability, loss aversion and only exhibit the overconfidence bias (Isidore and Christie, 2019). They also exhibit less local bias and less disposition effect (Dhar and Zhu, 2002; Dhar and Zhu, 2006) compared to the lower income investors as they have better access to financial advice from tax or financial planners and are also more capable of processing that information. Lower disposition effect translates to an increasing propensity to sell the losing stocks and a decreasing propensity to sell the winning stocks (Zhu, 2003). The higher income investors have better access to financial advice as they can afford such services and also find it more necessary to utilize such services as their investments are huge (Dhar and Zhu, 2002).

Characteristics of the Low-Income Investors

The low-income investors hold less diversified portfolios and hence bear the cost of under diversification. The extent of diversification rises with the level of income (Goetzmann and Kumar, 2004;2008; Florentsen et al., 2019). The low-income investors allocate a smaller proportion of their wealth to equity investments (Florentsen et al., 2019). Ranjith (2002) showed that the lower income Indian investors in the income bracket of Rs. 1 to Rs. 1.5 lakhs are actively involved in stock markets. The lower income investors also have lower education and hold mostly domestic stocks thereby exhibiting home bias (Florentsen et al., 2019). They also have lower financial literacy level relatively compared to the higher income investors (Lusardi and Mitchelli, 2007). The low-income investors prefer dividend income as the preference for dividend yield reduces with income. Hence the low-income investors buy stocks disproportionately during the period before the ex-dividend day. This results in the ex-day premium reducing with the income level of the investor with specific reference to small stocks and a lot of abnormal stock buying by the low-income investors, post the dividend announcements (Graham and Kumar, 2006). The low-income investors have a much higher portfolio size to income ratio compared to the high-income investors (Goetzmann and Kumar 2008).

Objective of the Study

The main objective of the study is to examine if the income earned by the investor played an important role in the choice of decision-making techniques employed by the secondary equity investors residing in the Chennai city of India.

Sample and Methodology

The population for the study is the active secondary equity investors located in the Chennai city in India. The samples selected include the clients of the famous financial services company named Integrated and the members of Tamil Nadu Investors Association (TIA). Only those secondary equity investors who have been active in the market for a minimum period of two years have been included in the sample. TIA was selected as it was the only formal body which granted access for data collection. Similarly, Integrated was the only company which granted access for data collection from their clients. The questionnaire survey method was adopted for data collection. The total number of valid questionnaires collected was 436 and hence the sample size was 436. The details of the questionnaires distributed, those collected, and the response rate is given in the table below for each of the data sources. The response rate is very high and the incomplete questionnaires returned are very negligible.

Data Source	Questionnaires distributed	Questionnaires returned	Incomplete questionnaires	Valid questionnaires	Response rate
Integrated	360	320	15	305	84.72%
TIA Meeting	65	61	7	54	83.07%
Online questionnaires	-	-	-	77	-
Total				436	-

Table 1. Sample of the Study

Results and Analysis

The main objective of the research was to analyse the impact of investors' income on the type of technique selected for decision making in the secondary equity market. In order to measure the various decision-making techniques employed by the respondents, the respondents were first asked to identify the variables influencing their stock investment decision in the secondary equity market. Twenty variables were listed, and the respondents were asked to rate their importance in the stock investment decision using a Likert scale ranging from 5 (Significantly important) to 1 (Totally unimportant). These variables measured were then reduced using Factor analysis (Principal Component method) followed by the Orthogonal rotation in order to derive the decision-making techniques. The decision-making techniques thus derived include: (1) Economy analysis (2) Industry analysis (3) Company analysis (4) Technical analysis and (5) Advocate recommendation. The descriptives of these techniques along with the mean and standard deviation of each of their

variables are shown in Table 2 below. The Cronbach alpha which indicates the reliability of each of these techniques is also shown in the table.

Decision Making Technique	Variables influencing stock investment decision	Mean	S.D	Cronbach's alpha
Economy analysis	GDP, growth rate, etc.	3.47	1.269	0.868
	RBI rate	3.47	1.212	
	Current economic indicators like inflation	3.58	1.108	
Industry analysis	Market for the industry to which company belongs	3.65	1.107	0.841
	Government policies in the industry	3.66	1.191	
	Supply chain constraints in the industry	3.47	1.100	
	Future prospects of the industry	3.75	1.094	
	Technology changes in the industry	3.78	1.102	
Company analysis	Bonus share issued	3.70	1.252	0.842
	Data in reports and prospectuses	3.78	1.131	
	Dividends paid by the company	3.84	1.209	
	Profits of the company	3.93	1.275	
	Financial statements of the company	4.05	1.185	
Technical analysis	Chart Patterns like Head and Shoulders	3.13	1.163	0.862
	Indicators and Oscillators	3.18	1.173	
	Support and Resistance levels	3.23	1.157	
	Moving averages	3.30	1.184	
Advocate recommendation	Friend/co-worker recommendation	2.95	1.249	0.788
	Family member's opinion	2.99	1.280	
	Professional recommendation	3.36	1.227	

Table 2. Descriptives of the decision-making techniques

The annual income which is the next important variable of the study was measured using multiple choice question. The annual income profile of the sample shown in Table 3 below, indicates that the majority of the sample belonged to the lower income group. Around 60.1% of the sample was in the group of Rs. 4 lakh and below. The average annual income of the sample was Rs. 4.24 lakh.

Annual income	Frequency	Percent	Valid Percent	Cumulative Percent
2 lakhs and below	155	35.6	35.6	35.6
2.01 to 4 lakhs	107	24.5	24.5	60.1
4.01 to 6 lakhs	60	13.8	13.8	73.9
6.01 to 8 lakhs	31	7.1	7.1	81.0
8.01 to 10 lakhs	28	6.4	6.4	87.4
More than 10 lakhs	55	12.6	12.6	100.0
Total	436	100.0	100.0	

Table 3. Annual income profile of the sample

In order to test the hypothesis of whether there is a significant difference in the means of the decision-making techniques of the secondary equity investors divided in terms of the income earned annually, Analysis of variance (ANOVA) test was employed. ANOVA tests compare the sample means which is divided into groups based on a categorical variable in order to check if there is enough evidence to prove that the means of the corresponding population also differ. The means of the decision-making techniques divided on the basis of

the annual income earned were compared in the ANOVA test so that the decision-making technique employed by the high income versus the low-income investors could be identified. From the ANOVA-test results (Table 4) it can observed that except in economy analysis and company analysis, the respondents belonging to the various income groups differed in all the other decision-making techniques as their p-values were significant at the 0.01 level.

S.No	Decision-making techniques	F value	p - value
1	Economy analysis	1.384	0.229
2	Industry analysis	3.674	**0.003****
3	Company analysis	1.179	0.319
4	Technical analysis	5.369	**0.000****
5	Advocate recommendation	5.666	**0.000****

** significant at 0.01 level

Table 4: ANOVA test results of Decision-making techniques vs. Annual income

The descriptives of the significant decision-making techniques shown in Table 5 indicate that:

Income Categories	Industry Analysis		Technical Analysis		Advocate Recommendation	
	Mean	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
2 lakhs and below	-.118	.985	.0796	.989	**.222**	.883
2.01 to 4 lakhs	-.007	1.076	.136	.898	.090	.935
4.01 to 6 lakhs	**-.256**	.891	.0885	.898	-.105	.867
6.01 to 8 lakhs	.198	.858	**.266**	.740	-.327	1.017
8.01 to 10 lakhs	.195	.897	-.406	1.260	.019	1.296
More than 10 lakhs	**.415**	1.003	**-.528**	1.109	**-.511**	1.176

Table 5: Descriptives of the Significant Decision-making techniques

Industry Analysis

The respondents in the annual income group of more than Rs.10 lakh had the highest mean and the respondents in the annual income group of Rs. 4.01 to 6 lakh had the lowest mean.

Technical Analysis

The respondents in the annual income group of Rs. 6.01 to 8 lakh had the highest mean and the respondents in the annual income group of more than Rs.10 lakh had the lowest mean. Based on the Tukey post hoc test (Table A1), the mean of the technical analysis in the annual income group of more than Rs. 10 lakh was significantly less than the means of the technical analysis in all other annual income groups except Rs.8.01 to 10 lakh.

(I) Annual income of the respondent	(J) Annual Income of the Respondent	Mean Difference (I-J)	Std. Error	Sig.
More than 10 lakhs	2 lakhs and below	-.608*	.153	**.001**
	2.01 to 4 lakhs	-.664*	.162	**.001**
	4.01 to 6 lakhs	-.617*	.182	**.010**
	6.01 to 8 lakhs	-.794*	.219	**.004**
	8.01 to 10 lakhs	-.122	.227	.995

***** The mean difference is significant at the 0.05 level.

Table A1: Tukey Post Hoc Test – Technical Analysis vs Annual Income

Advocate Recommendation

The respondents in the annual income group of Rs. 2 lakh and below had the highest mean and the respondents in the annual income group of more than Rs.10 lakh had the lowest mean. This corroborated with the finding of Hayat et al. (2010) where the respondents in the lower income group had herd behavior, which involved peer recommendations.

Male vs. Female Investors

For an in-depth examination about the variations among the investors belonging to the different income groups with respect to the decision-making technique employed, the male and the female investors were further tested in isolation.

By employing data filters, the male and female responses were isolated. The ANOVA results for the female investors shown in Table A2 indicate that the results were insignificant for all the decision-making techniques. Hence the female investors do not contribute much to the significance identified earlier (in Table 4).

S.No	Decision-Making Techniques	F- value	p-value
1	Economy analysis	2.187	0.061
2	Industry analysis	0.583	0.713
3	Company analysis	1.524	0.188
4	Technical analysis	0.600	0.700
5	Advocate recommendation	0.350	0.881

Table A2: ANOVA results of Decision-Making Techniques vs. Annual Income - Female Investors

For the male investors, the ANOVA test which compared the means, were found to be significant for all the three decision making techniques: industry analysis, technical analysis and advocate recommendation (as shown in Table 6)

S.No	Decision-making techniques	F- value	p-value
1	Economy analysis	0.635	0.673
2	**Industry analysis**	**3.090**	**0.010**
3	Company analysis	1.656	0.145
4	**Technical analysis**	**5.494**	**0.000**
5	**Advocate recommendation**	**6.955**	**0.000**

Table 6: ANOVA results of Decision-making techniques vs. Income of Male investors

Income Categories	Industry Analysis		Technical analysis		Advocate Recommendation	
	Mean	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
2 lakhs and below	-.007	1.006	.056	1.063	**.238**	.929
2.01 to 4 lakhs	-.008	1.073	.122	.952	.051	.949
4.01 to 6 lakhs	**-.206**	.930	.067	.884	-.226	.863
6.01 to 8 lakhs	.282	.925	**.420**	.613	-.491	.958
8.01 to 10 lakhs	.265	.929	-.490	1.324	-.082	1.221
More than 10 lakhs	**.505**	1.032	**-.606**	1.166	**-.681**	1.061

Table 7: Descriptives of the Significant Decision-Making Techniques of Male Investors

Industry Analysis

The male respondents in the annual income group of more than Rs.10 lakh had the highest mean and those in the annual income group of Rs. 4.01 to 6 lakh had the lowest mean.

Technical Analysis

The male respondents in the annual income group of Rs. 6.01 to 8 lakh had the highest mean and those in the annual income group of more than Rs.10 lakh had the lowest mean. Based on the Tukey post hoc test (Table A3), the mean of the technical analysis in the annual income group of more than Rs. 10 lakh was significantly less than the means of the technical analysis in all the other annual income groups except Rs.8.01 to 10 lakh.

(I) Annual income of the respondent	(J) Annual income of the respondent	Mean Difference (I-J)	Std. Error	Sig.
More than 10 lakhs	2 lakhs and below	-.662*	.184	**.005**
	2.01 to 4 lakhs	-.728*	.187	**.002**
	4.01 to 6 lakhs	-.673*	.208	**.017**
	6.01 to 8 lakhs	-1.026*	.253	**.001**
	8.01 to 10 lakhs	-.116	.257	.998

*. The mean difference is significant at the 0.05 level.

Table A3: Tukey Post Hoc Test – Technical Analysis vs Annual Income – Male Investors

Advocate Recommendation

The male respondents in the annual income group of Rs. 2 lakh and below had the highest mean and those in the annual income group of more than Rs.10 lakh had the lowest mean.

Younger vs. Older Investors

To further probe into the ANOVA results of Table 4, the sample was divided based on the age categories and tested again with respect to the annual income. The sample respondents were classified into the young, middle-aged, and senior investors depending on the age group they belong to. Investors in the age group of 35 years and below were labelled as young investors; those in the age group of 36 to 55 years were labelled as middle-aged and the investors in the age category of above 55 years were labelled as senior investors. The age profile of the sample is detailed below in Table 8.

Age Categories	Frequency	Percent	Valid Percent	Cumulative Percent
Young Investors	168	38.5	38.5	38.5
Middle-aged Investors	137	31.4	31.4	70.0
Senior Investors	131	30.0	30.0	100.0
Total	436	100.0	100.0	

Table 8: Profile of the Sample Based on the Biological Age of the Investor

Young Investors

When the young investors were isolated using data filters and the means of the decision-making techniques were compared using ANOVA, industry analysis and advocate recommendation were found to be significant (as shown in Table 9).

S.No	Decision-making techniques	F- value	p-value
1	Economy analysis	1.660	0.147
2	**Industry analysis**	**2.997**	**0.013**
3	Company analysis	0.572	0.721
4	Technical analysis	1.556	0.175
5	**Advocate recommendation**	**3.391**	**0.006**

Table 9: ANOVA results of Decision-Making Techniques vs Annual Income – Young Investors

The descriptives shown in Table 10 show that:

Annual Income Categories	Industry Analysis		Advocate Recommendation	
	Mean	**S.D.**	**Mean**	**S.D.**
2 lakhs and below	-.463	.904	.205	.849
2.01 to 4 lakhs	-.219	1.114	**.458**	.767
4.01 to 6 lakhs	**-.639**	.959	-.343	.676
6.01 to 8 lakhs	.272	.934	.010	.980
8.01 to 10 lakhs	-.108	.934	-.281	1.236
More than 10 lakhs	**.243**	.938	**-.369**	1.362

Table 10: Descriptives of Significant Decision-Making Techniques– Young Investors

Industry Analysis

Young investors in the high annual income group of more than Rs. 10 lakhs had the highest mean whereas those in the Rs. 4.01 to 6 lakhs had the lowest mean.

Advocate Recommendation

Young investors in the high annual income group of more than Rs. 10 lakhs had the lowest mean whereas those in the Rs. 2.01 to 4 lakhs had the highest mean.

Middle – Aged Investors

The middle-aged investors in the age group of 36 to 55 years when isolated, and the means of the decision-making techniques compared in the ANOVA tests, showed that industry analysis, technical analysis and advocate recommendation were significant (as shown in Table 11). The senior investors when isolated and means compared, none of the decision-making techniques were significant as shown in Table A4.

S.No	Decision-making techniques	F- value	p-value
1	Economy analysis	0.481	0.790
2	**Industry analysis**	**2.320**	**0.047**
3	Company analysis	0.186	0.968
4	**Technical analysis**	**3.742**	**0.003**
5	**Advocate recommendation**	**3.197**	**0.009**

Table 11: ANOVA Results of Decision-Making Techniques vs Annual Income – Middle-Aged Investors

S.No	Decision-making techniques	F- value	p-value
1	Economy analysis	1.850	0.108
2	Industry analysis	0.535	0.749
3	Company analysis	1.773	0.123
4	Technical analysis	1.059	0.386
5	Advocate recommendation	1.905	0.098

Table A4: ANOVA Results of Decision-Making Techniques vs. Annual Income – Senior Investors

The descriptives shown in Table 12 show that:

Annual Income Categories	Industry Analysis		Technical Analysis		Advocate Recommendation	
	Mean	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
2 lakhs and below	.098	1.022	.138	1.087	**.189**	.914
2.01 to 4 lakhs	.171	1.083	.065	.888	-.208	1.073
4.01 to 6 lakhs	**-.372**	.7345	.143	1.000	.137	.867
6.01 to 8 lakhs	.002	.692	**.765**	.602	-.729	1.301
8.01 to 10 lakhs	.369	.921	-.387	1.476	.044	1.425
More than 10 lakhs	**.502**	.929	**-.738**	1.137	**-.719**	1.067

Table 12: Descriptives of Significant Decision-Making Techniques– Middle-Aged Investors

Industry Analysis

Middle-aged investors in the high annual income category of more than Rs.10 lakhs had the highest mean and those in the Rs.4.01 to 6 lakhs group had the lowest mean.

Technical Analysis

Middle-aged investors in the high annual income category of more than 10 lakhs had the lowest mean and those in the Rs.6.01 to 8 lakhs group had the highest mean.

Advocate Recommendation

Middle-aged investors in the high annual income category of more than Rs.10 lakhs had the lowest mean and those in the Rs.2 lakhs and below group had the highest mean.

Multinomial Logistic Regression

Regression was adopted in order to strengthen the analysis and to derive more conclusive relationships. Multinomial logistic regression was adopted as the dependent variable, annual income was a categorical variable with three categories namely: Low income, Average income and High income. The independent variables included the five decision making techniques, gender, and age. Based on the literature review, equity investment knowledge (Volpe et al., 2002; Beal and Delpachitra, 2003; Kumar and Kasilingam, 2017; De Clercq and Venter, 2009) and risk appetite (Peress, 2004; Calvet et al., 2009;Donkers et al., 2001;Cohn et al., 1975; Riley and Chow, 1992;Geetha and Vimala, 2014;Sung and Hanna, 1996;Gupta and Sharma, 2016) were also included as the independent variables. The interpretation of the results are as follows:

Step Summary

Only the significant interaction results appear in this table (Table 13). The chi-square statistics which were significant include gender*equity investment knowledge (10.178, $p<0.05$) and gender*advocate recommendation (6.970, $p<0.05$), indicating that these interactions have a significant effect on the annual income earned.

Model	Action	Effect(s)	Model Fitting Criteria	Effect Selection Tests		
			-2 Log Likelihood	Chi-Square[a]	df	Sig.
0	Entered	Intercept, Advocates Recommendation, Company Analysis, Industry Analysis, Knowledge, Age, Risk, Technical Analysis, Economy Analysis	833.106	.		
1	Entered	Gender * Knowledge	822.928	10.178	2	.006
2	Entered	Gender * Advocates Recommendation	815.958	6.970	2	.031

Stepwise Method: Forward Entry

a. The chi-square for entry is based on the likelihood ratio test.

Table 13: Multinomial Logistic Regression – Step Summary

Model Fitting Information

The model fitness was assessed using the Chi-square statistic. The Chi-square statistic was 129.635 and p-value was less than 0.05. This proves that there is a significant relationship between the dependent variable and the independent variables in the final model.

Model	**Model Fitting Criteria**	**Likelihood Ratio Tests**		
	-2 Log Likelihood	**Chi-Square**	**df**	**Sig.**
Intercept Only	945.593			
Final	815.958	**129.635**	20	**.000**

Table 14: Multinomial Logistic Regression – Model Fitting Information

Goodness of Fit

The Deviance (814.572) statistic test proves that the model is fit as the test is not statistically significant and the p-value is more than 0.05. The Pearson statistic test however proves otherwise.

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	949.787	830	.002
Deviance	814.572	830	.642

Table 15: Multinomial Logistic Regression – Goodness of fit

Pseudo R-Square

The Pseudo R-square measures of Cox and Snell (0.257), Nagelkerke (0.290) and McFadden (0.137) show that the model explains 13.7% to 29% of the variance and represents decent-sized effects.

Pseudo R-Square	
Cox and Snell	.257
Nagelkerke	.290
McFadden	.137

Table 16: Multinomial Logistic Regression – Pseudo R-square

Likelihood Ratio Test

The likelihood ratio test proves that the independent variables, Industry analysis (p-value: 0.021), Technical analysis (p-value: 0.007), Gender*Advocate recommendation (p-value: 0.031) and Gender*Equity investment knowledge (p-value: 0.002) are significant, which shows that these predictors contribute significantly to the final model.

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	Df	Sig.

Intercept	843.609	27.651	2	.000
Advocates Recommendation	8.160E2	.000	0	.
Company Analysis	818.821	2.862	2	.239
Industry Analysis	823.674	7.715	2	**.021**
Knowledge	8.160E2	.000	0	.
Age	821.291	5.332	2	.070
Risk Appetite	818.406	2.448	2	.294
Technical Analysis	825.823	9.865	2	**.007**
Economy Analysis	819.143	3.184	2	.203
Gender * Advocates Recommendation	822.928	6.970	2	**.031**
Gender * Knowledge	828.304	12.346	2	**.002**

Table 17: Multinomial Logistic Regression – Likelihood Ratio test

Parameter Estimates

The Parameter estimates table is given below (Table 18).

Annual Income[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
Low Income Group	Intercept	1.689	.454	13.814	1	.000	
	Advocates Recommendation	-.191	.245	.611	1	.435	.826
	Company Analysis	.184	.118	2.436	1	.119	1.202
	Industry Analysis	.119	.126	.890	1	.346	1.127
	Knowledge	-.175	.163	1.144	1	.285	.840
	Age	-.169	.082	4.304	1	.038	.844
	Risk Appetite	-.113	.099	1.305	1	.253	.893
	Technical Analysis	-.019	.126	.022	1	.881	.981
	Economy Analysis	.092	.120	.580	1	.446	1.096
	[Gender=1] * Advocates Recommendation	.452	.284	2.521	1	.112	1.571
	[Gender=2] * Advocates Recommendation	0[b]	.	.	0	.	.
	[Gender=1] * Knowledge	-.396	.130	9.269	1	.002	.673
	[Gender=2] * Knowledge	0[b]	.	.	0	.	.

Annual Income[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
High Income Group	Intercept	-1.018	.565	3.245	1	.072	
	Advocates Recommendation	.042	.317	.018	1	.895	1.043
	Company Analysis	-.004	.137	.001	1	.974	.996
	Industry Analysis	.394	.145	7.359	1	.007	1.484
	Knowledge	.580	.186	9.693	1	.002	1.787
	Age	-.158	.096	2.713	1	.100	.854
	Risk	-.160	.114	1.965	1	.161	.852
	Technical Analysis	-.393	.134	8.654	1	.003	.675
	Economy Analysis	-.165	.133	1.534	1	.216	.848
	[Gender=1] * Advocates Recommendation	-.411	.350	1.382	1	.240	.663
	[Gender=2] * Advocates Recommendation	0[b]	.	.	0	.	.
	[Gender=1] * Knowledge	.043	.144	.088	1	.767	1.043
	[Gender=2] * Knowledge	0[b]	.	.	0	.	.

a. The reference category is: Middle Income Group.
b. This parameter is set to zero because it is redundant.

Table 18: Multinomial Logistic Regression – Parameter Estimates

Among the low income group, age (p-value: 0.038) and gender*equity investment knowledge (p-value: 0.002) have a significant impact on the annual income earned.

- Investors who were older (higher age value) are less likely to belong to the low income group compared to the average income group. For every 1 unit increase in age the odds of an investor belonging to the low income group change by a factor of 0.844.
- The probability of an investor whose equity investment knowledge decreases and is a male investor was likely to belong to the low income group compared to the average

income group was 0.673 times than those who are female investors. This implies that the low-income investors are likely to be male investors with decreased equity investment knowledge.

Among the high income group, industry analysis (p-value: 0.007) , equity investment knowledge (p-value: 0.002), and technical analysis (p-value:0.003) have a significant impact on the annual income earned.

- Investors who employ industry analysis are more likely to belong to the high income group compared to the average income group. For every 1 unit increase in industry analysis the odds of an investor belonging to the high income group change by a factor of 1.484.
- Investors with more equity investment knowledge are more likely to belong to the high income group compared to the average income group. This finding corroborates with the findings of several other studies (Volpe et al., 2002; Beal and Delpachitra, 2003; Kumar and Kasilingam, 2017; De Clercq and Venter, 2009). For every 1 unit increase in equity investment knowledge the odds of an investor belonging to the high income group change by a factor of 1.787.
- Investors who employ technical analysis are less likely to belong to the high income group compared to the average income group. For every 1 unit increase in technical analysis the odds of an investor belonging to the high income group change by a factor of 0.675.

Discriminant Analysis

ANOVA and Regression analysis prove that the income earned plays an important role in the decision-making technique adopted by the investor in the secondary equity market. Investors also need to choose the right decision-making technique which yields high returns in the equity market. Earning good returns in equity investment is the main goal of equity investors. If the variables of this study could be employed in developing a model to predict the return earned in equity investment (high vs. low), the model could be very helpful for equity investors. Discriminant analysis is thus adopted as it predicts the membership in two or more mutually exclusive groups.

By employing the variables of the study namely: the five decision-making techniques and the annual income along with other financial dimensions (proportion of investment in equity; experience in the stock market; knowledge about equity investment; risk taken and the expected return to be earned in equity investment), as the predictor variables, a discriminant model was developed in order to predict the classification into the high and low actual return groups. Actual return of more than 15.01% has been classified as the high actual return group and lower than 15% as the low actual return group.

The Eigenvalue table shown in Table 19 below shows the eigen value which is an indicator of the discriminating ability of the discriminant model developed. The high value of 0.900 shows that the model developed discriminated well. The table also shows the canonical correlation score of 0.688 which also shows that the model was good at discriminating between the high and the low returns.

Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
.900	100.0	100.0	.688

Table 19: Discriminant Model – Eigenvalue Table

The Wilks' Lambda table shown in Table 20 shows that the corresponding Chi-square statistic was significant at the 0.001 level, which implies that there was a relation between the independent predictor variables and the dependent groups. The Chi-square test examined the discriminating ability of the model. The Chi-square value which is 275.139, was high enough to show that the model discriminated well. The Wilks' Lambda score of 0.526 shows that 52.6% of the total variance in the discriminant scores was not explained by the differences among the groups.

Wilks' Lambda	Chi-square	df	Sig.
.526	275.139	11	.000

Table 20: Discriminant Model – Wilks' Lambda Table

The classification summary table shown in Table 21 shows that overall, 85.3% of the original cases were classified correctly implying that the discriminant model was robust.

		Actual Return Coded for Discriminant	Predicted Group Membership		Total
			1	2	
Original	Count	1	279	44	23
		2	20	93	13
	%	1	86.4	13.6	100.0
		2	17.7	82.3	100.0

a. **85.3**% of original grouped cases correctly classified.

Table 21: Discriminant Model – Classification summary table

With the help of the function coefficients in Table 22, the Discriminant equation was given by

$$D = 0.048 X_1 + 0.213 X_2 + 0.014 X_3 - 0.024 X_4 + 0.2 X_5 + 0.796 X_6 + 0.166 X_7 - 0.121 X_8 + 0.072 X_9 - 0.054 X_{10} - 0.173 X_{11}$$

Where, X_1 is annual income; X_2 is equity investment proportion; X_3 is stock market experience; X_4 is equity investment knowledge; X_5 is risk level; X_6 is expected return; X_7 is industry analysis; X_8 is technical analysis; X_9 is company analysis; X_{10} is economy analysis; X_{11} is advocate recommendation

Predictor Variables	Function
Annual income	.048
Equity investment proportion	.213
Stock market experience	.014
Equity investment knowledge	-.024
Risk level	.200
Expected return	.796
Industry analysis	.166
Technical analysis	-.121
Company analysis	.072
Economy analysis	-.054
Advocate recommendation	-.173

Table 22: Standardized Canonical Discriminant Function Coefficients

The level of influence of the predictor variables on the discriminant score is indicated by the magnitude of their coefficients. Expected return has the highest magnitude (0.796) showing that they had the greatest influence on the discriminant score. Among the decision-making techniques, industry analysis and company analysis have a positive co-efficient implying that the adoption of these techniques lead to higher equity returns. Whereas the coefficients of the economy analysis, technical analysis and advocate recommendation were negative implying that adoption of these techniques lead to lower equity returns.

The results of the Discriminant model clearly show that adopting industry analysis and/or company analysis may lead to a higher probability of earning higher returns in the equity market whereas the adoption of economy analysis, technical analysis and/or advocate recommendation led to lower returns.

Financial profile - Cross Tabulation

The financial profile of the investors in each category is detailed according to the cross-tabulation table given below in Table 23. The most significant income group in the ANOVA results was the high-income group of more than Rs.10 lakhs, where the majority (i)

invest a high proportion of savings in equity investment, (ii) have an average equity investment experience and equity knowledge (iii) take a moderate to high risk and (iv) earn good returns of more than 25% in equity investment. Hence this high-income group which has a great financial profile, was less likely to employ technical analysis and/or advocate recommendation and more likely to employ industry analysis, according to the ANOVA results determined earlier in Table 4.

Similarly, the next significant income group in the ANOVA results was the low-income group of Rs.2 lakhs and below, where the majority (i) invest a very low proportion of savings in equity investment, (ii) have low equity investment experience and equity knowledge (iii) take low risk and (iv) earn lower returns in equity investment. Hence this low-income group which has a poor financial profile, was more likely to employ technical analysis and/or advocate recommendation and less likely to employ industry analysis, according to the ANOVA results determined earlier in Table 4.

Financial Dimension	Categories	2 lakhs and below	2.01 to 4 lakhs	4.01 to 6 lakhs	6.01 to 8 lakhs	8.01 to 10 lakhs	More than 10 lakhs	Total
Proportion of direct investment in equity out of monthly savings	5% and less	106	33	21	10	6	9	185
	6% - 10%	30	45	18	6	13	15	127
	11% - 15%	11	12	5	5	3	7	43
	16% - 20%	3	3	9	2	0	5	22
	More than 20%	5	14	7	8	6	19	59
	Total	155	107	60	31	28	55	436
Length of experience in the stock market	5 years or less	92	40	16	10	7	8	173
	5.01 - 10 years	32	33	23	6	8	18	120
	10.01 - 15 years	13	11	11	9	5	16	65
	15.01 - 20 years	12	10	3	1	0	4	30
	Above 20 years	6	13	7	5	8	9	48
	Total	155	107	60	31	28	55	436
Equity investment knowledge	Very little knowledge	64	28	10	2	1	3	108
	Some investment knowledge	59	48	30	14	10	16	177
	Good knowledge	25	22	16	11	15	22	111
	Very good knowledge	6	6	4	4	1	12	33
	Business investor	1	3	0	0	1	2	7
	Total	155	107	60	31	28	55	436
Risk level of the respondent	Level 1	36	13	6	4	4	7	70
	Level 2	25	19	9	4	8	6	71
	Level 3	62	39	28	16	9	15	169
	Level 4	10	17	14	4	4	17	66
	Level 5	22	19	3	3	3	10	60
	Total	155	107	60	31	28	55	436
Actual capital appreciation in equity investment	0% and below	33	14	2	3	1	3	56
	0.01 - 5%	50	32	12	7	7	10	118
	5.01 - 10%	37	16	15	5	3	3	79
	10.01 - 15%	22	15	11	7	7	8	70
	15.01 - 20%	5	15	8	5	3	7	43
	20.01 - 25%	4	6	7	2	2	9	30
	Above 25%	4	9	5	2	5	15	40
	Total	155	107	60	31	28	55	436

Table 23: Financial Profile of the Investor Sample

The high returns earned by the high-income investors could be attributed to various characteristics like high financial literacy (Volpe et al., 2002; Beal and Delpachitra, 2003; Kumar and Kasilingam, 2017; De Clercq and Venter, 2009), high risk-taking ability (Donkers et al., 2001; Cohn et al., 1975; Riley and Chow, 1992; Sung and Hanna, 1996; Yitzhaki,

1987; Gupta and Sharma, 2016), higher competence (Chandra, 2009), more confidence (Calvet et al., 2009), better access to information (Peress, 2004; Zhu, 2003) and less susceptibility to biases (Dhar and Zhu, 2002; Dhar and Zhu, 2006; Isidore and Christie, 2019).

The low returns earned by the low-income investors could be attributed to various characteristics like poor diversification (Goetzmann and Kumar, 2004;2008; Florentsen et al., 2019), lower financial literacy (Lusardi and Mitchelli, 2007) and vulnerability to biases (Florentsen et al., 2019; Graham and Kumar, 2006).

Conclusion

This study attempts to investigate all the dimensions of the income influence on stock investing in the secondary equity market. The quantitative analysis was facilitated by a questionnaire survey of 436 secondary equity investors residing in Chennai. The factors influencing the stock investment decision were measured and then by Principal Component Factor analysis, the decision-making techniques were derived. The means of the decision-making techniques of the various income groups were compared using the ANOVA tests. Further probing into the results were done using the data filters. Multinomial logistic regression analysis resulted in a robust model which showed that industry analysis, technical analysis, gender*advocate recommendation and gender*equity investment knowledge are significant predictors of the annual income. The regression model also revealed that (i) older investors are less likely to belong to the low income group compared to the average income group; (ii) the low-income investors are likely to be male investors with decreased equity investment knowledge; (iii) investors who employ industry analysis are more likely to belong to the high income group and those who employ technical analysis are less likely to belong to the high income group compared to the average income group and (iv) investors with more equity investment knowledge are more likely to belong to the high income group compared to the average income group. A robust discriminant model was developed to predict the returns earned in equity investments. The results of the Discriminant model show that adopting industry analysis and/or company analysis may lead to a higher probability of earning higher returns in the equity market whereas the adoption of economy analysis, technical analysis and/or advocate recommendation led to lower returns. The cross-tabulation analysis was employed to describe the demographic and financial profile of the high and the low-income group of investors. This study serves as a guide for investors, advisors, government bodies and investor associations. Investors could use the results of the study to analyse the financial mistakes they are prone to make owing to lower income because of less exposure to financial knowledge. Advisors, government bodies and investor associations can also assist the less knowledgeable low-income investors and educate them about poor diversification, behavioral biases, and other financial blunders. The results of the study clearly indicate that the low-income investors are the most vulnerable to financial mistakes. Government bodies need to provide additional training and guidance to the lower income investors so that they choose the right decision-making technique and avoid mistakes in their financial transactions. Financial industry/policy makers can utilize the findings of this study and incorporate appropriate policies which would benefit and help to educate the low-income investors who are more prone to earn lower returns due to their choice of decision-making technique and lower financial literacy levels. When the right policies are in place, the lower income investors can be educated and protected from making financial mistakes.

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