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Demographic Variables Impact on Individual Investment Return

Fakrul Ahmed[1]; Md Fazlul Huq Khan[2]

Abstract

The study tries to find out the impact of investors demographic variables on the return from the stock market. The data has been collected from the brokerage and Marchant banks for individual investors investments, return and demographic characteristics. The research covers the period from 2009 to 2021 and have a decade long enough to identify the trend. The structural break in the data also been adjusted to avoid any kind of endogeneity. The regression results suggest that demographic variables affect the investment pattern and beta return for the investors. the demographic variables such as education, location and experience have positive links with the beta whereas age and income show negative association. The education, income and experience variables are also found to be significant in the empirical analysis.
Keywords: Stock Market, Individual return, Bangladesh

Introduction

Due to the recent roller coaster ride Dhaka Stock Exchange Index's has taken, one can ask the question, do stock markets affect overall economic development? Although some analysts view stock markets in developing countries as "casinos" that have little positive impact on economic growth, recent evidence suggests that stock markets can give a big boost to economic development. Stock markets may affect economic activity through the creation of liquidity. Many profitable investments require a long-term commitment of capital, but investors are often reluctant to relinquish control of their savings for long periods. Liquid equity markets make investment less risky--and more attractive--because they allow savers to acquire an asset--equity--and to sell it quickly and cheaply if they need access to their savings or want to alter their portfolios. At the same time, companies enjoy permanent access to capital raised through equity issues. By facilitating longer-term, more profitable investments, liquid markets improve the allocation of capital and enhance prospects for long-term economic growth. Further, by making investment less risky and more profitable, stock market liquidity can also lead to more investment. Put succinctly, investors will come if they can leave. A stock market's success or failure depends on its investors. So, to understand the overall rise and fall of share prices, we have to understand the motivation and characteristics of the investors who are driving the share prices up and down. An asset has a Beta of zero if its returns change independently of changes in the market's returns. A positive beta means that the asset's returns generally follow the market's returns, in the sense that they both tend to be above their respective averages together, or both tend to be below their respective averages together. A negative beta means that the asset's returns generally move opposite the market's returns: one will tend to be above its average when the other is below its average.

Beta is the measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market. Beta is used in the capital asset pricing model (CAPM), a model that calculates the

[1] Faculty of Business Studies, University of Chittagong
[2] PhD. Candidate, University of International Business and Economics (UIBE), Beijing, China

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expected return of an asset based on its beta and expected market returns. Beta is calculated using regression analysis, and you can think of beta as the tendency of a security's returns to respond to swings in the market. A beta of 1 indicates that the security's price will move with the market. A beta of less than 1 means that the security will be less volatile than the market. A beta of greater than 1 indicates that the security's price will be more volatile than the market. For example, if a stock's beta is 1.2, it's theoretically 20% more volatile than the market.

Literature Review

Heena (2015) examined the relationship between demographic variables and personality traits on investors' attitude towards risk & return. The author found that there exists a direct positive relationship between income and risk tolerance level and income. The results also indicate that education and personality are irrelevant and don't have any impact on determining the return for the individual investors. Ahmed et al. (2013) conducted a study in Pakistan to measure the relationship and impact of demographic variables on investment decisions. The authors concluded that age is a critical factor in the investment. Older generation are very much risk averse and young generations take higher risks. This led to higher return for the young generations. They also prefer risky investment with highest return in short time.

Jamshidinavid et al. (2012) conducted a study to the relationship between Personality traits and demographic ones on the financial behavior prejudices in Tehran Stock in 2011. The results show that the investment prejudices in individual investigators have relationship with personal characteristics meaningfully and with some of the demographic variables weakly. Mahmoudi, (2021) worked on the growth accounting framework of Iran and found that individual behavioral perspectives play a critical role in determining the return rate and indirectly affects overall growth. Mahmoudi & Ghaneei (2022) analyzes the behavior of Canadian oil market movement, and the results show that individual perceptions and demographic characteristics contribute significantly on the volatility of the market.

Ahmed (2021) worked Corporate Boards, Audit Committees and Voluntary Disclosures of the listed companies in Bangladesh. The analysis show that the companies with highest best practice tend to receive more investments from the individual investors and generate high beta for the market. Ahmed (2021) also measured the capital market efficiency through investigating the randomness of return series of Dhaka Stock Exchange of Bangladesh. The author found that both internal and external factors have contribution on determining the randomness of beta return of the stock market. Khan (2021) figured out that inflationary pressure resulted in the change of demographic behavior of the individual investors and affects short-term investment decisions.

Bishnoi (2014) analyzes the demography of investors residing in Delhi and Faridabad and their investment objectives with the various options available in the Indian Money market and financial market. The study uses sample of 400 investors were chosen from the Delhi and Faridabad district. The survey found that Occupational group, gender of respondents, martial status, age, income, area of residence and level of education have significant association with various investment return and objectives. Ahamed (2021) in the paper analyzes the impact of coronavirus on the stock market return and found that this external threat significantly reduces the beta return of the market.

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Data & Methodology

As sample for the study, we have collected thirty portfolios from one of the city's many brokers houses. The entire sample portfolios have been collected randomly from one portfolio manager. Among the samples there are male and female investors from various occupations. As for the overall performance of the portfolios this is somewhat bleak. Out of the 3000 portfolios, only 35% gained values, and 65% suffered losses.
I have used "Weighted mean" to calculate the overall gain percentage of the 3000 portfolios.

$$\sum_{i=1}^{n} xi.wi$$

I believe that weighted mean truly reflects the overall performance of all these portfolios as it considers the relative portfolio sizes as ill as the percentage of gain and loss.
In this case, the weighted average loss is: -6.96%
In statistics, regression analysis includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables. More specifically, regression analysis helps one understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed. Most commonly, regression analysis estimates the conditional expectation of the dependent variable given the independent variables — that is, the average value of the dependent variable when the independent variables are held fixed. Regression test has been used to find out the individual company beta as well as how the dependent variable *Beta* (β) affected by independent variable such as, Age (measured in years), Education (which is measured by the total years of education of the investor), Monthly Income (measured in Taka), association with Dhaka Stock Exchange (measured in years).

All collected data can be divided into two broad categories based on their sources. The data we have used to do the research are from Secondary sources, which means, we have not collected the information directly from the investor, instead we meet with their portfolio manager, MTB Securities who was kind enough to supply us with the demographic details of these investors as ill as a copy of their investment portfolio. The individual company *Beta* (β) has been collected from following website www.stockbangladesh.com, which is also a secondary data source. The beta has been calculated using regression between weekly company excess return and market excess return for the last two years.

The data used to calculate the individual company beta is collected from the year 2009 to 2021. As we have collected weekly price of the individual stock and the market index and then calculate the excess stock return and market return and run regression analysis with those two variables, you have got the company beta which represents the volatility of a company's share price in response to the volatility of the market's index. Using the data of such wide range we believe we will get a more accurate beta which will help us to achieve a more precise conclusion regarding the findings.

Empirical Results

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In statistics, regression analysis includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable, in the case which is portfolio beta and one or more independent variables like age, income, education and association with DSE. More specifically, regression analysis helps us understand how the typical value of the dependent variable Beta changes when any one of the independent variables is varied, while the other independent variables are held fixed. The regression equation is as follows:

$$Beta_{ij} = \beta_0 + \beta_1 Age_{ij} + \beta_2 Edu_{ij} + \beta_3 Inc_{ij} + \beta_4 Loc_{ij} + \beta_5 Exp_{ij} + e_{ij}$$

Where Beta implies the liquidity ratio for the *i*th investor in *j*th time, the age indicates age of the investor, Edu implies highest education received, Inc indicates the annual income of the investor, loc is the location of the investor and exp means total experience the investor has in stock market.

Estimated Outcomes

Variables	Coefficients	Std. Error	t-stat
Age	-0.003	0.004	-0.752
Education	0.039*	0.020	1.898
Income	-2.834*	4.112	-6.901
Location	0.689	0.045	.988
Experience	1.224*	0.869	1.87

The regression equation shows that age and income have negative association with beta whereas education, location and experience have positive association with beta. The age has negative but insignificant relationship with beta. Education seems to have positive but significant relation with beta. This implies education provides enough knowledge to earn a positive return. Income is surprisingly having negative and significant association with beta. Investors with higher income seems to have low focus on stock market. Location is a good factor, investors located in remote area or far proximity also have an impact on the beta. Finally, the experienced investors tend to earn more money and have a positive return on beta. The variable is statistically very significant and have a strong impact on the beta.

Conclusion

The objective of the paper is to check the investment behavior of an investor affected by demographic variables such as age, sex, education, income, occupation, association with the stock exchanges. Beta has been used as a quantifiable measure of investor's behavior. The Beta (β) of a stock or portfolio is a number describing the relation of its returns with those of the financial market. The multiple regression results found that the demographic variables such as education, location and experience have positive links with the beta whereas age and income show negative association. The education, income and experience variables are also found to be

significant in the empirical analysis. The findings can help investors and policy makers to understand the demographic variables impact on the investment return in the stock exchanges.

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