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Determinants of Stock Return for Non-Financial Sector: Evidence from Energy Sector of Pakistan

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Abstract

This research aims to investigate the determinants of stock return for non-financial firms listed on Pakistan stock market. The firms which have been taken under consideration belong to the energy sector of Pakistan. This research has included two known variables which are firm level characteristics (firm age, firm size and firm Solvency) and macro-economic factors of interest rate and economic growth. In this study, 22 companies out of total 35 companies have been taken for analysis purpose. The data has been taken for the period of 2006 to 2016. Empirical findings of the study revealed that there was a positive relationship between firm age and stock returns while firm size hasn't shown any significant impact on stock returns. It has been found that there was a significant relationship between solvency ratio and stock returns. The results of the regression model confirmed that there was a negative relationship between solvency ratio and stock returns as well as between interest rate and stock price. The interest rate has also shown a statistically significant impact on stock returns. In addition to it, results also showed that there was a significant relationship between economic growth and stock return.

Keywords: Firm age; Firm size; Firm solvency ratio; Interest rate; Economic growth

Introduction

Background

Non-financial institutions which are not administered by a national or international banking regulatory agency have deep roots in the economic development of any country. Hence both financial as well as non-financial sectors play a vital part in economic growth and prosperity. The companies listed on the stock exchange expand on both the national as well on the global level. The stock exchange is the place, where an investor and borrower meet the transactions of lending and borrowing of funds through the trading of stocks.

The study is specifically based on the oil and gas sector of the Pakistan. The important aspect of this research is to identify the relationship between the returns on the stocks with the variables affecting the stock returns of energy related organizations listed in the Pakistan Stock exchange. These factors include, firm size, firm age, firm solvency, interest rate and growth rate. This study is of a great importance for the practitioners, policy makers and for the investors in making significant decisions. Theoretical perspective states that the changes in the nonfinancial part credibly regulates the stock returns, yet the level of outcome is diverse for different stocks. The stock exchanges and the financial markets have changed the regulations and improved the performance of the stock trading volume, over the last two decades in Pakistan.

This research investigates the relation of the main determinants of stock return of the non-financial sector of Pakistan. It explores a variety of factors that influence the determinants of stock returns and manipulate the financial decision taken by the top-level management of the organization.

This paper endeavors to answer the subject of what decides the stock returns of Pakistan's recorded firms in the nonfinancial area. As indicated by the creators' learning, it is the main careful review to be directed in Pakistan as to determinants of stock return of recorded non-budgetary firms.

The World Bank Economic Review additionally contributes in its report of May 1996, issued to the part of the securities exchanges in financial development. There are various components affecting the execution of securities exchanges, for example, development in the nation's Financial exercises, quality in the conversion standard, diminish loan costs and change in credits, rescheduling and installment of remote obligations, substantial scale mergers and acquisitions, better association with the neighboring nations, speculator well-disposed strategies and solid administrative system. In Pakistan securities exchanges, execution is likewise influenced by legitimate, monetary and political elements.

Stock exchange execution, monetary and political state of a nation is interrelated and has been a huge debating issue. Many reviews straight forwardly or in a roundabout way have been managing the macroeconomic and institutional variables and their relationship with the share trading system execution at both hypothetical and experimental levels.

Gap in this area

It has been seen that, most of the work done on trends, policies and their framework, and human aspects whereas determinant of stock return in the energy sector have not been given due importance. The present study investigates the detail of stock return with greater focus on the energy sector. Previous literature specific to this industry has focused on a limited number of determinants. However, this study focused on many other additional determinants related to the energy

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sector. In previous studies, researchers hadn't used the variables (used in this study) at the same time.

This study has discussed and evaluated stock return with two aspects, one is firm's level and the other is the macroeconomic factors. An attempt is made to predict the future stock returns on the basis of previous financial performance indicators of the energy sector and the economy as a whole. In previous researches, the researchers analyzed few years data with less amount of companies, but this research included 10 years data with 22 companies of energy sector which are enlisted in Pakistan Stock Exchange.

Objectives of study

The main objectives of the study are to identify the determinants of stock returns of non-financial sector (specifically energy sector) companies listed on the Pakistan Stock exchange.

The research objectives of this study are:

- To explore the relationship between firm size and stock returns.
- To find out the effect of firm age on stock returns.
- To find out the effect of the firm solvency on stock returns.
- To find out effect of interest rate on stock returns.
- To find out effect of economic growth on stock returns.

Literature Review

Financial and political condition of any country is interrelated with the stock marketplace overall performance and essential problem for debating. The study done by Zafar [1] includes macroeconomic determinants of Pakistan stock marketplace and overall performance tested by the time collection facts of 1988-2008. The main determinants of macroeconomics are; foreign direct investment as percentage of GDP, real interest rate, domestic credit provided by way of the banking region and cost traded as percent of GDP. The findings are the FDI and cost traded a nice effect on stock market overall performance and real interest has bad relationship with stock market performance. Also banking improvement sector don't have any significant impact on stock market overall performance.

After 1980, the relation between firm-level qualities and stock returns has been broadly explored. Result of the researches propose that there is a huge linkage between firm particular factors like firm size, firm age, and interest rate, solvency of firm and growth rate of the stock returns in the countries which were examined.

Firm size

The firm size is a common method used in the empirical corporate finance to define the key characteristics of the firm. The researchers studied frequently the firm size in the corporate finance but always the results are different, so we cannot access the sensitivity of the firm size the study conducted by Dang & Li in the year 2015 was on the topic to investigate the empirical relation of the firm size. The study also determined the different factors such as total assets, total sales and the overall capital of the firm effecting on the overall size of the firm.

The investors, policy makers, stock market analyst, practitioners, government, multinational business as well as the corporations can grasp the interest of them with the implication of the Study. The study is specifically based on the Pakistan non-financial markets specific to the oil and the gas sectors. The investors who want to invest either in large or small organizations based on the small book to market equity ratio but not considering the firm size and the stock return and found no relation between these two factors. The investor may find the negative relation between the stock returns and the firm size.

The size of the firm and book-to-market value impact catches the cross-area variety in normal comes back from 1963 through 1990 in the US [2]. In spite of the fact that propose that size and book-to-market value proportion clarify the variety in stock returns, these factors were subjectively chosen for investigation and thus don't give a monetary story.

While trying to relate size and book-to-market value to financial fundamentals, investigated whether the conduct of stock costs in relation to size and book-to-market value mirrored the conduct of profit. Their outcomes show that there are market, firm size and book-to-market value impact on profit like those in returns [3].

There are couple of publication that has been distributed on the power of the FF multifaceted model for the Asian markets and those were the first to explore the strength of the multifaceted model in the Asian locale. They found a feeble connection between normal stock returns and the general market. They considered and expressed that stock returns are all more firmly identified with the FF qualities: firm size and book-to-market value proportion [4].

Firm size makes a superior showing with regards to representing OTC stock returns than do flagging impacts or other great impacts referred in the writing [5]. Hypothesis predicts that declarations by little firms uncover progressively and in this way, incite more prominent impacts, by amplifying impacts of insider flagging. Some proves to recommend that a firm size might be ascribed to issue-related expenses [5].

Firm age

Economically the firm age is the number of years of the company listing in the stock exchange. The past literature measures the firm age is the key factor for the profitability and the return on the stock [6]. The company's number of years is that in which the life/age of the Company is considered. The companies listed on the stock exchanges have the vast structure of the capital and avail every opportunity for the growth. The company products and services demands are high in the corporate governance structures and the company has media exposures structures [7]. There is negative relationship between age and profitability of the companies neglecting all the factors. The firm age is inversely relation towards the performance and the profit of the organization; by using the sample of the Spanish firms from 1998 to 2006 investigate to find the relation between them. The companies with the older age lose the opportunity for the growth and that's why the profit or return declines with the growth [8]. While on the other hand the different studies found the positive relation with the firm age and the returns on the stock. The same data used by the other researchers found the significant positive relation, the firm performance increases with the increase of the number of years of the firm.

The arguments on the other hand are different, the study based on the firm listed on the Nigerian Stock Exchange market are measured with the returns on the stock, firm age and the firm size. There is negative relation between the stock returns and the incorporation and with listing age [9,10]. With the decline in the risk, it also causes the declining in the rates of return of the corporation. However, the firm age affects the uncertainty of the returns that declines the profitability of the companies.

In financial aspects and administration, the age of the organizations and establishments is partitioned into the steps. In the writing of these sciences, a few models have been exhibited for the age of the organizations which in the system of these models, the organizations and the establishments take after a particular arrangement considering each progression of their monetary age. Diverse approaches following the different methods are established for considering the information of the companies [11].

The study was first conducted at the end of the nineteenth century, where the researchers divide the field of the age cycle of the companies and studied in the different angles in accounting [12]. The researchers divide the companies into three to four different steps such as the company growth, maturity and decline. The researchers then established the relations on the each step of the company life cycle with the accounting such as the returns. The Effect on the firm advertising and the selling expenses of the products are services create the linkage between prices of the stock market. The researchers step by step find out the relations of the firm life cycle and returns.

A significant relation between the factors affecting the stock prices and the stock return on the step by step stage of the company life cycle. To the growth of the firm there is a negative relation between the firm age and the expenses made for the seller and the advertisements [12].

The relationship between firm age and return on the stocks is determined with diverse perspective. Some of the researcher reported that there was a positive and significant relationship between age and return of the stocks. While many of them found the negative relationship among them. The debate on the firm age and the stocks return has been proved inconclusive from different studies of the researchers.

Organism life cycle theory may describe the perfect negative relationship between the firm age and the returns of the firms. According to the theory, the organisms like human and plants have the life cycle. A time of flourishing strength and an old age when exit becomes almost inevitable.

Positive relationship is measured between the firm age, firm size and the returns of the companies. The study done by laboya & Ohiokha in the year 2016 indicated with the presence of the control variables and to the size of the corporations that the results have shown negative relation between the organizations age and the returns [13]. Moreover, the hypothesis built on the structural criterion proves the positive relationship between the firm size and the profitability. From the literature, the management of the firm must increase the day to day operations to improve the performance and with the age of the firm, the operations nature will be mature, and the profit ratio will be increased.

Interest rate

The Interest rate is the percentage charged on the principal amount when a borrower borrows money from investor or lender. The interest rates are charged on the annual based percentage set by the controlling parties.

A World Bank study revealed the facts related to the significance correlation between the firm equity returns and the stock prices listed in the emerging markets. They have contra effects with the increase or decrease of the interest rates [14]. The study was conducted in the Indian markets have found the similar evidence of stock price behavior with the market inefficiency [15].

Many countries have been facing with the problem of inflation. The interest rate inflation has significant negative relation between the real activities of the country. However, the positive relation is measured in the stock returns to the stock markets. According to the researcher, the returns in the stock market have the negative correlation with the inflation. But some analyst considered that it was the short term interest rate [2].

On the other perspective, the stock prices of the long term interest rates for the stocks is calculated with the present value model of the stocks and discounting back the interest factor. The study ignore the effects of the long term and short term interest rates which determined the relation between the yield and the stock returns of the non-financial companies [16]. The variable used to define the excess of the returns and by using the same variables predicts the more variability for the return. By using the similar analysis of the stock return on the bills, debt and the stocks can be fruitful for the decisions making and the predictions on the return of the stocks [16]. The stock returns have the significant impact of the interest rate; a study was conducted by using the regression analysis, the results directed the positive relation of the interest and the stock returns when the long term interest rates were implemented, while the short term interest rate and the stocks had no significant relation [17].

A study using the VAR model was conducted to investigate the different variables such as the firm output, interest rate, exchange rate and the stock returns. The results showed that the interest rate has the inverse relation with the stock returns [18]. Hence the interest rate has significant relation with the stock returns. With the increase in the interest rate, the prices of the stocks definitely decrease, and when the interest rates decrease, the returns on the stocks increase. But all the abnormal up and down in the prices are for short period of time, the market supply and demand factor also impact on the prices, markets goes to the equilibrium position and become stable. The past literature after the World War II, the inverse relation has been found in the interest and the stock prices. Between the time periods of the 1940 to 1960, the interest rate was historically less in the markets along with the low inflation rate. The stocks at that time generate the sufficient returns in the terms of the nominal and as well as the real terms of the economy. The Interest-bearing assets like bonds, stocks, real estates and the commodities in the past history always found the inverse correlation between them [19].

The fifteen developed and underdeveloped countries conducted researches in which it was found that there is negative relation between the interest rate and the stock prices [19]. In the light of the evidences, study based on the Japanese financial markets from the period of 1998 to 2003, the results from the regression model suggest that with the market interest rate, the efficiency of the market also increase or decrease. While on the other hand, between the stock returns and the interest there has been found a negative relation. The study conducted with the same factors in the Malaysia which showed that there was a positive relation. Micro economic variables and stock returns were also investigated during the period of 1973 to 2004 companies listed in the Pakistan Stock Exchange. The relationship was defined by using the vector error correlation model.

Macroeconomic variables, such as interest, economic growth have major impact on the stock return of the non-financial companies listed in the Pakistan Stock Exchange [20]. The relationship of the macro economic factors such as interest and the stock return of the companies listed in the Athens Stock Exchange was measured. By applying the Johansen's cointegration test and the Granger Causality

tests, the researchers were able to conclude their Findings that there was significant relation between the interest rate and the stock returns of the non-financial companies [21].

Another study by Matemilola in the year 2017 [22], explained the relation of the stock return and the interest. The study explained that with the passage of the time, the companies grow and use their experience for making the right decisions of the capital structure that ultimately maximize the capital by issuing the debt instruments and increase the debt interest shield that has impacted in the increase of the shareholders stocks return. Firm detect the interest on debt before the tax, that why by paying the minimum tax, shareholders have maximum share returns. The firm age also has the significant impact on the debt and the stock returns. The study finds out, there is a positive relation between the firm age and the firm returns of the stock and as well as on the debt [22].

A study on the companies listed from 1980 to 2003 in Amman Stock Exchange based on the empirical relation of the real economic factors, money supply, inflation, interest rate investigated by applying the vector error correction model. The finding were found to be contradictor., The real economic factors have positive effect on the stock returns, while on the other side, money supply, consumer price index has the negative impact on the stock returns. The similar type of study was conducted on the Jordanian stock prices and the findings included the negative relation of the stock returns and the interest [23].

Solvency ratio

The solvency proportion of an association gives a knowledge into the capacity of an association to meet its money related commitments. Dissolvability likewise shows how much the association relies on upon its loan bosses and banks can utilize this when the association applies for a credit office. The monetary proportion can be characterized as a connection between a two individual quantitative budgetary data associated with each other in some intelligent way, and this association, is considered as a significant money related marker which can be utilized by the diverse budgetary data clients. Also, a standout among the greater part of these budgetary proportions is the Liquidity Ratio. Regardless of whether liquidity through brisk proportion has huge effect on Jordanian banks stock returns through return on assets has (ROA The Study based on the 15 Jordanian banks listed at the Amman Stock exchange (ASE), data based on the financial reports from the 2005-2011. The study findings revealed the direct impact on the solvency ratio to return on the stocks. The researcher concludes that, the returns of the bank listed in the ASE have positive relation, as the return on the asset increases with the increase of the solvency ratio [24].

A few researchers found about the empirical relation between stock returns and stocks solvency which demonstrated a negative relationship between them. In current review, the relationship between stock returns and its solvency capacity in organizations recorded in Tehran Stock Exchange. There was a negative relation between the solvency ratio and the stock returns of the non-financial companies listed in the stock exchange. The data on the monthly bases used for the study from the year 2002 to 2009. The increase in the stock returns decrease the solvency of the asset of the firms [25]. The firm solvency ratio has empirical facts on the price difference and the purchase or sale of the stocks or other financial assets. The solvency is the key factor to investigate the price of the stocks regarding the sale and purchase of the stocks. The researcher investigated the relation by using the shares of the non-financial companies listed in the New York Stock Exchange from the time periods of the 1960 to 1980. The findings were quite impressive, the shares with the less solvency potential were having stock returns by the larger amount and the typical investors and just few of them hold for benefits with the higher risk. With the change of the 1% from the dealing gap in the stock market, there was about 2% returns on the stock returns.

Japanese studies also investigated the relation of the stocks solvency and the stock returns of the non-financial companies. There is a negative relationship between the solvency of the firms with the stock returns. A liner and the positive relation between the solvency of the firm assets and the stocks returns were found out in the Tehran Stock Exchange. A negative relationship was found between the risky stocks towards the solvency of the firm financial assets. Firm size, firm book to equity ratio and the market price of the stocks also have the impact on the earning per share of the stocks and ultimately the return on the stock [26].

Another study with the similar circumstances was conducted in the Tehran Stock Exchanges. The firm solvency has the significant positive impact on the stock returns of the companies. The price to earnings ratio with the book value in the current market also has impacts on the stocks return with the liquidity concerns. The risky stocks have the low solvency listed in the Stock Exchanges of any countries with the high return due to risky nature [27].

A negative correlation between stock returns and the solvency of the firm's ability listed in Tehran Stock Exchange [25]. Stocks turnover ability to the stock transactions on the stock exchanges are impacts on the solvency of the non-financial companies [28]. A moderate relation is found in the monetary policy of the company with the solvency of the firm financial assets.

On contrast, the study was conducted to investigate the relation of the solvency and the stocks listed in the US listed non-financial companies. The results showed the significant positive relation between the solvency of the assets and the stock returns. The study find out the effect of the stock solvency and the value of the firm in the form of the stocks, based on the non-financial firms listed on the Indonesian Stock Market. The researcher used the panel data with the cross sectional and the time series to explore the results. The results explained the positive relationship between the solvency of the firm with the multifactor such as before interest and taxes, stock prices, the debt to equity and the total taxes paid on the total assets.

The relationship between the firm solvency and the dividend paid by the firms were investigated, there is negative relationship between the dividends and the solvency of the financial stocks. On the other hand, another study with the similar context based on the non- financial firms listed on the NYSE, there was a significant relation between the stock returns and the solvency of the firm. The most of the companies give preferences to the purchase of its stocks back instead of paying the dividends when the stocks are more liquidate in the market.

Economic growth

Stock Exchange is an organized, systematic market of sale and purchase of economic and industrial securities. It is a convenient place for the securities, trade system, i.e. according to certain rules and regulations.

Various functions are being performed and useful services for investors and the loan companies. It is to facilitate an interim investment, and economic and industrial development of a country.

Firms at maturity stage earn lower returns than firms in the growth

stage, and their costs of capital are reduced. In the last stage, firms at the declining stage experience stagnation and suffer from falling returns because of external challenges [29].

Firm age and shareholder return relationship can explain through life cycle theory. Companies that are closer to maturity have a lot of experience and decisions structure effective capital to make the benefits of a tax burden on Modigliani and Miller stressed to maximize theory [30]. As companies from birth to growth phase or approaching adulthood, they have a lower debt and increase debt benefit from interest -rate benefit, take profitability to increase shareholder [29]. Which gives rise to the fact that companies can deduct pay interest on debt before tax [30]. Therefore, the fixed age is to reduce the relationship between debt and share return. Our hypothesis is that companies grow, look through external financing of foreign debt. In line with this argument, mated age theory hard life cycle [31]. A direct and positive link between age and sustainable return measures, in particular, they are used to confirm a fixed age and their results in a fixed cycle as a replacement.

In a developed country conduct empirical study on risk return and firm age relationship, Faccio et al. examined the effects of greater diversification of risk-business shareholder shares; Faccio et al. as effective as an enterprise risk. They report in a 15 europian countries as a negative relationship between business risk and firm age. Using monthly stock returns data from the United States, Baker and Wurgler control for firm age when investigating how investor sentiment affects stock returns, and the coefficient on firm age shows positive and negative signs. In a review that analyzes the valuation impacts utilize firm age as a determinant of return [31]. They report confirm that firm age is emphatically Identified with return measures in the United States. Agiomirgianakis et al. confirmed the significant positive regression between firm age and stock return. Agiomirgianakis et al. argues that it seems that larger businesses are more profitable than younger businesses, with the cumulative learning impact.

Theoretical Reflections

Research methodology

Research means identification of real-life issues and providing their attainable solutions [9]. Research is an efficient request that examines theories, proposes new understandings of information or messages, and offers new conversation starters for future research to investigate. The basic purpose of research is to identify the real cause of unpleasant circumstances and every study provides systematic, logical and detailed explanation of the problems and provide possible solutions to satisfy the problem (Figure 1).

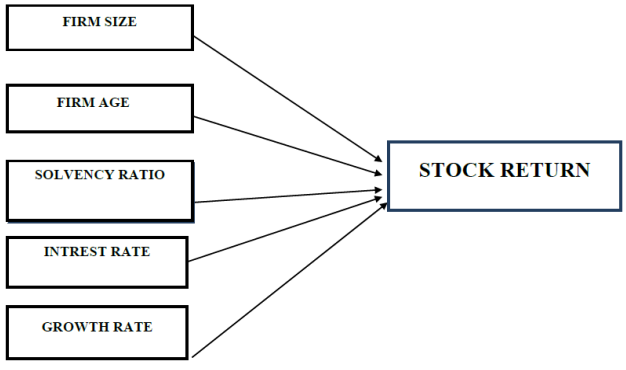

Figure 1: Theoretical reflections.

Model for the study: The following theoretical model was derived for testing:-

$SR = \alpha + \beta 1FS + \beta 2FA + \beta 3INT + \beta 4SR + \beta 5$

Where,

α=constant value

β=beta coefficient

ε=error term

SR=Stock Return

FS=Firm Size

FA=Firm Age

INT=Interest

SR=Solvency Ratio

GR=Growth Rate

Hypothesis development: Total five variables have been used in this study. The only dependent variable of the study is stock return and the independent variables are hypothesized as follow:

H1: There is a significant relationship between firm size (FS) and stock return

H2: There is a significant relationship between Firm Age (FA) and stock return

H3: There is a significant relationship between Interest (INT) and stock return

H4: There is a significant relationship between Solvency Ratio (SR) and stock return

H5: There is a significant relationship between Growth Rate (GR) and stock return (Table 1)

There is one dependent variable, Stock Return, and other independent variables are firm Size, firm Age and firm solvency. There are other Macroeconomic independent variable as Interest and Economic growth.

Explanation of variables

This study consists of two categories of independent variables. The first category of the independent variable is firm specific and includes the following:

- Firm size
- Firm age
- Firm solvency ratio

Variable	Measures
Dependent Variable	
Stock Return	Annually Avg. Stock return
Independent Variable	
Firm Size	Total Asset
Solvency Ratio	Debt to Equity Ratio
Interest Rate	Annual interest by Government for companies
Firm Age	No. of Operating Years
Economic Growth	GDP annual growth rate

Table 1: Variables of the study.

The firm size is measured by the total assets whereas the second independent variable which is firm Age is measured by number of operating years. The third independent variable is a firm solvency ratio, which can be determined by Debt to Equity Ratio.

The second category of the independent variable is macroeconomic variable which includes the following

- Interest Rate
- Annual and Economic Growth

Above mentioned variables can be measured by Gross Domestic Product

Data Collection & Analysis

Data source

Firm specific variable data are collected from balance sheet analysis (BSA) available on state bank of Pakistan (SBP) website whereas stock return variable data can be collected from World Bank website.

Sample size

This research utilized secondary data from financial statements, including income statement, balance sheet, and cash flow statement, issued by Power Generation, Oil and Gas companies listed on the Pakistan stock exchange. The data was obtained from Pakistan Stock Exchange, State Bank of Pakistan and company analysis reports. This research also used annually stock return from each firm. Sample size is selected from the year 2006 to 2016.

Time span

Secondary data from the period of 2006 to 2016 has been considered.

Data Analysis

Different tests were applied in this study which are as follows:-

- Descriptive Statistics
- Correlation
- Hausman Test
- Regression Analysis

Firstly, descriptive statistics were initially calculated to find the correlation between independent variables. After checking that correlation, the impact of independent variables on the dependent variable has been checked by using the Regression analysis. For the analysis, multiple linear regression analysis was utilized to check the impact of the independent variable on the dependent variable. After the application of descriptive statistics, regression analysis and correlation, then finally Hausman test was applied to check the suitability of fixed effect or random effect model. As Hausman test distinguishes between fixed effects and random effects in panel data (panel data is known as the observations taken over multiple periods for the similar firms).

In this study predictive study has been conducted. Typically, most of the past researches used the panel data and as well as some of the researchers used longitudinal data to find the accurate results. Therefore, a cross-sectional dimension and a time series dimension have been used in the panel data defining more appropriately. However, panel information could have a more entangled bunching or various level structures.

Panel data has some benefits which are as follows:-

- Controlling for individual heterogeneity
- Gives more enlightening information
- Greater fluctuation
- Less co-linearity among the factors
- More degrees of opportunity
- More effectiveness
- Distinguish and measure impacts that are basically not recognizable in unadulterated cross-areas or immaculate time-arrangement information.

Settled impacts models are not without their down sides. The settled impacts models may regularly have an excessive number of cross-sectional units of perceptions requiring an excessive number of sham factors for their determination. An excessive number of dummy factors may sap the model of an adequate number of degrees of flexibility for satisfactorily effective measurable tests. Besides, a model with numerous such factors might be tormented with multicollinearity, which expands the standard mistakes and in this manner depletes the model of measurable energy to test parameters.

William H. Greene calls the random effects model a regression with a random constant term. One approach to deal with the numbness or blunder is to accept that the capture is an arbitrary result variable. The irregular result is an element of a mean an incentive in addition to an arbitrary mistake.

Data Analysis and Discussions

To start the analysis of data, initially researchers, have calculated the descriptive statistics and after that calculated the correlation between independent variables. After checking the correlation researchers checked the impact of independent variables on the dependent variable by using the multiple linear regressions. Further, Hausman test has utilized to select either to apply the random effect model or fixed effect model. Therefore, by depending on the results of Hausman test, this study utilizes a fixed effect model (Table 2).

Explanation of descriptive analysis results

For dependent variable stock price, there were 260 observations taken. In the Table 2, the mean values for stock returns, solvency, interest rates, firm size, firm age and economic growth as follows 0.020179, 0.442438, 11.05618, 9.323050, 35.13636 and 4.150967 respectively. This elaborates that the average returns on the stock across the sample is 0.020179. The figure 0.020179 suggests the average return for the whole sample for the non-financial firms in Pakistan.

The Solvency of the firm with the ratio of 4.42 impacts on the stock returns on the non-financial firms. Solvency of the firm has the weak relations with the stock returns. The finding shows the Interest rate have significant impact on the stock returns. The 11.0 shows the change in the interest rate have the change in the stocks of the non-financial sectors.

The firm size also has the significant impacts on the stock returns. With the comparison of the firm size 9.32 cause the change in the returns of the oil and gas sector of the Pakistan. Whereas, firm age has highly positive relation with the stock returns of the non-financial of the firms. The relations shows with the average of the 35, the stock returns of the firms will be affected. Economic growth, with the average of the 4.1 also caused the change in the stock returns.

The median values for the stock returns, solvency, interest rates, firm size, firm age and economic growth are 0.032521, 1.475000, 11.27900, 10.18084, 30.00000 and 4.367000.

The maximum value of the Std. Dev is 0.33 which is more from the average of the stock returns. The other values for stander deviation are 117.5282, 1.681484, 2.555155, 21.25351 and 1.805971. The Solvency of the firm found the highest standard deviation that is 117.52. The standard deviation for the other variable interest rates, firm size, firm age and economic growth are 1.68148, 2.55515, 21.25351 and 1.805971 respectively.

For spreading down the data the skewness is used and for flatness or steepness of data the kurtosis is used. The range of skewness is lies between the (-1 and +1). The data was found under the criteria of the skewness.

Explanation of correlation results

Table 3 represents correlation between independent variables, and it was found that data is free from multi co-linearity as there is no exact correlation between the independent variables. The Independent variables association should be less than 0.80 and shows that there is no multi collinearity. The range of correlation lies between the +1 and -1. While +1 shows that there is a strong positive relationship between the variables and -1 elaborates the strong negative relationship between the variable.

Table 3 explains the correlation of the dependent variable stock return with the independent variables. Solvency of the firm has weak positive relation with the returns on stocks. The interest rate shows the negative relation with the stock returns that means with the increase of the interest, the returns on stocks declines and with the decrease of the interest, the stock returns will increase in the market (Tables 4 and 5).

Firm size and the firm age also have the positive relation with the stock returns of the non-financial companies used as a sample in the research. Economic growth has the strong positive relation with the stock returns as compare to the firm age, firm size and solvency of the stocks.

While on the other hand, the Solvency of the stock has negative relation with the change in the interest rate, firm size and firm age. With the increase or decrease of the solvency ratio the values of the interest rate, firm size and firm age declines or moves upwards inversely. While in the case of economic growth, there is positive relation with the solvency of the stocks of the firm, with the high solvency ratio, the growth rate trend will be increase and vice versa.

Explanation of Hausman test results

The Hausman test is analyzed that either to apply the fixed effect or random effect model. The decision is based on Chi2 Value. If the P value<0.05 then apply the fixed effect model and if it is greater than the 0.05 then apply random effects model.

In this study, Hausman test has been applied the on data and the value of Chi2 is less than .05 so we applied the random effect model for further analysis of significance of the data.

Regression analysis

R-square is that measure that shows how much data is fitted on the regression line and it's near about. This is also termed as coefficient of determination. In the case of the random effect model the independent variable collectively explains the 31.17% variation in mentioned hypothesis, there is positive relationship between firm age and stock price.

	S.R	SOL	INT	FS	FA	EG
Mean	0.020179	0.442438	11.05618	9.323050	35.13636	4.150967
Median	0.032521	1.475000	11.27900	10.18084	30.00000	4.367000
Maximum	1.061413	795.7000	13.52900	13.14317	102.0000	7.667000
Minimum	-1.103992	-1604.520	8.654000	3.555348	7.000000	1.607000
Std. Dev.	0.333434	117.5282	1.681484	2.555155	21.25351	1.805971
Skewness	-0.241417	-9.221796	0.164507	-0.958471	1.078866	0.284222
Kurtosis	3.640486	153.8388	1.584113	2.980768	3.973075	2.226949

Table 2: Descriptive statistics.

	S.R	SOL	INT	FS	FA	EG
RET	1.000000					
SL	0.064416	1.000000				
INT	-0.364030	-0.054138	1.000000			
FS	0.079441	-0.053013	0.086416	1.000000		
FA	0.088484	-0.178029	0.035919	0.289760	1.000000	
EG	0.182651	0.029895	-0.832492	-0.084605	-0.034273	1.000000

Table 3: Correlation.

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	21.418478	5	0.0007
** WARNING: estimated cross-section random effects variance is zero.			

Table 4: Hausman test results.

Dependent Variable: RET				
Method: Panel Least Squares				
Total panel (balanced) observations: 242				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	1.242496	0.407707	3.047524	0.0026
SL	-0.585905	0.000168	0.512182	0.6090
INT	-0.142001	0.020414	-6.956062	0.0000
FS	-0.063024	0.039981	-1.576369	0.1164
FA	0.034885	0.007728	4.514369	0.0000
EG	-0.069988	0.018988	-3.685800	0.0003
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.311770	Mean dependent var		0.020179
Adjusted R-squared	0.228542	S.D. dependent var		0.333434
F-statistic	3.745978	Durbin-Watson stat		1.960601
Prob(F-statistic)	0.000000			

Table 5: Impact of independent variables dependent variable by applying fixed regression model.

Findings also suggested that there is positive relationship between them. Also, the firm age has economically and statistically significant at 1% change on stock returns. If we increase firm age by 1 unit the stock price will increase by 0.034885 units.

The t-statistics is -4.514369 which is significant. This reveals that the firm age has a positive value and have significant impact on stock returns. For second variable, firm size has significant negative impact on stock price. Findings suggest that there is economically significant but statistically it is not. With the increase the firm age by 1 unit, the stock price will be decreased by 0.063024 units. The t-statistics is -1.576369 at which is significant at 0.1164, which is greater than 0.5. This reveals that the firm size has positive and have a positive impact on stock returns. For third variable, hypothesis that firm solvency has a relationship with stock price. Our findings after applying fixed effect are explained that there is negative relationship between them and solvency ratio is economically significant with stock price but statistically it's not significant.

If we increase 1 unit of solvency ratio the stock price will be increased by -0.585905 units. The t- statistics is 0.512182 at which is not significant and greater than 0.05. This reveals that the solvency of firm stock has positive impact on stock returns. Next, we have hypothesis that there is negative relationship between interest rate and stock returns. Our study findings also explain same that there is negative relation between them. Also, the interest rate is economically significant but statistically it's not significant.

If we increase the 1 unit of interest rate the stock price will decrease by 0.142001 units. The t- statistics is -6.956062 at which is significant at 0.000. This reveals that the Interest rate has negative and have negative impact on stock returns. For last variable we have hypothesis that there is relationship between economic growth and stock returns. Our findings are there is negative relationship between them. If we increase the economic growth by 1 unit the stock price will be decrease 0.069988 units. Also, the economic growth has economically significant impact on stock returns but statistically it's not. The t-statistics is -3.685800 at which are significant at 0.003 Which is less than 0.05. This reveals that the economic growth has negative impact on stock returns.

Hypothesis testing

H1: There is a significant relationship between firm size (FS) and stock return Rejected

H2: There is a significant relationship between Firm Age (FA) and stock return Accepted

H3: There is a significant relationship between Interest (INT) and stock return Rejected

H4: There is a significant relationship between Solvency Ratio (SR) and stock return Rejected

H5: There is a significant relationship between Growth Rate (GR) and stock return Accepted

Conclusion

The main purpose of the study was to explore the relationship between firm size and stock returns, firm age and stock return, firm solvency and stock return, interest rate and stock return, economic growth and stock return.

Empirical findings reveal that there is a positive relationship between firm age and stock returns. Firm size has no significant impact on stock price. There is a relationship between solvency ratio and stock price. The study's findings after applying fixed effect are explained and shows that there is negative relationship between them.

The findings also explain the same that there is a negative relationship between the two; - interest rate and stock price. Also, the interest rate significantly impacted stock returns statistically. Whereas there is a positive relationship between economic growth and stock returns.

Future Research Direction

The study verified the determinants of stock returns for non-financial sector of Pakistan. But this study has focused on the energy sector firms. Future researchers can study the behavior of other industries like manufacturing, automobiles and FMCG firms.

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