DETERMINANTS OF EARNINGS RESPONSE COEFFICIENT; EVIDENCE FROM NON-FINANCIAL SECTOR OF PAKISTAN

By

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ABSTRACT

Thesis Title: Determinants of Earnings Response Coefficient; Evidence from Non-Financial Sector of Pakistan.

The study provides new evidence between the relationship of unexpected earnings and abnormal return. Earnings provide the information reflected in stock price and investors react over the available information provided by the firm. The earnings response coefficient is obtained by the regression of stock price and accounting profit. The aim of this study is to examine the determinants of earnings response coefficient as default risk, systemic risk, growth opportunities, firm size, profitability, financial leverage, inflation rate and interest rate and its impact on non-financial firms listed at Pakistan Stock Exchange. The study used the multiple regression models for the period of 2011 to 2016. Data gathered has been processed and analyzed by E-views 9 package. This study applies proportionate sampling technique for the selection of 160 listed non-financial firms of Pakistan Stock Exchange.

The empirical results of the study confirmed that the default risk has significant negative impact on earnings response coefficient. Growth opportunities, firm size, profitability and financial leverage have positive and significant impact on earnings response coefficient. But systemic risk, inflation rate and interest rate has insignificant impact on earnings response coefficient. Moreover, the earnings response coefficient has direct or positive relationship with growth opportunities, firm size, profitability and financial leverage and has inverse or negative relationship with default risk. Thus, the determinants of earnings response coefficient study has provide an additional extension to literature, as there is no considerable work on earnings response coefficient being Pakistan is a developing economy.

Keywords: Earnings response coefficient, surprise earnings, default risk, financial leverage, cumulative abnormal return.

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LIST OF ABBREVIATIONS

AR	Abnormal Return
CAR	Cumulative Abnormal Return
CAPM	Capital Asset Pricing Model
CSR	Corporate Social Responsibility
CSRM	Cross-sectional Regression Methodology
DAR	Debit on Assets Ratio
DER	Debit to Equity Ratio
ERC	Earnings Response Coefficient
EMH	Efficient Market Hypothesis
EPS	Earnings per Share
FZ	Firm Size
FSCM	Firm Specific Coefficient Methodology
GRTH	Growth
IR	Interest Rate
Infl.	Inflation Rate
L	Leverage or Financial Leverage
P/E Ratio	Price / Earnings Ratio
P	Profitability
ROA	Return on Assets
PSX	Pakistan Stock Exchange
UE	Unexpected Earnings
UR	Unexpected Return

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DEDICATION

This innovative research work dedicated to Allah عَزَّوَجَلَّ and his beloved Prophet Hazrat Muhammad صَلَّى اللهُ تَعَالَى عَلَيْهِ وَالِهِ وَسَلَّمَ and to my honorable and kind parents. Without their prayers, love, moral and financial support, the completion of this work would never been possible.

CHAPTER NO.1

INTRODUCTION

1.1 Background of the study

The basic issue of accounting and finance from many decades is the relationship between the firm earnings and stock returns (Pimentel and Lima 2010). Earnings Response Coefficient is the association of stock returns to earnings surprises around the time of firm earnings announcements. So, the Earning Response Coefficient measures the sensitivity of stock markets. Earnings response Coefficient is the reporting of earnings through a regression slope coefficient between unexpected returns and surprise earnings of the firm (Al-Baidhani, Abdullah, Ariff, Cheng, & Karbhari, 2017a).

Fama (1970) presented Efficient Market Theory which states that the security prices are always "fully reflected in" all the publicly available firm information. So, earnings announcement made by the firm, the market is expected to react to that information or announcements instantly, only to the extent of the unexpected component of the news. This happens due to the announcement that is expected by the stock market would have already been known in market and shows its effect in the stock prices. However, an announcement which contains only information already known to the market considered to have no information content. Therefore, no reaction to the announcement is expected into the market. An unexpected change in earnings is therefore expected to occur into the market. The extent of the change in stock prices which caused by such unexpected change in accounting earnings is the earnings response coefficient (Zakaria, Isa, & Abidin, 2013a).

The market reaction to unexpected change in accounting earnings of the firm is not constant or not remain the same across securities and it change in regard to firm and market features or characteristics. In developing countries like Pakistan, the factors affecting the earnings response coefficient or cross-sectional variations in ERC is very important topic for research work. The factors mentioned as being significant and important in determining ERC in the prior research which most commonly studied are: default Risk (Yohan-An, 2015; Zakaria et

al., 2013a) systematic risk (Azizi, Pramuka, & Hidayat, 2016; Zakaria et al., 2013a) firm growth opportunities (Mashayekhi & Aghel, 2016; Suwarno, Tumirin, & Zamzami, 2017; Zakaria et al., 2013a) firm size (Azizi et al., 2016; Mashayekhi & Aghel, 2016; Suwarno et al., 2017; Zakaria et al., 2013a) financial leverage (Azizi et al., 2016; Moradi, Salehi, & Erfanian, 2010) and profitability (Azizi et al., 2016; Suwarno et al., 2017).

The unexpected return is the return, which obtained due to some unforeseen event. Unexpected return is estimated by using the Cumulative Abnormal Return. Abnormal return is obtained by the difference of actual return and expected return and finally obtained the CAR by averaging the abnormal return. The unexpected earnings or surprise earnings are explained as when the reported earnings are above or below the investors or predictors expectations. Unexpected Earnings is due to some event or some confidential information which provide return to investor above or below their expectations. Unexpected earnings are estimated as the change in annual earnings per share.

The default risk is the measure of risk which is related to debit of the firm. Default risk provides the dimensions of risks which not completely captured by beta Dhaliwal and Reynolds (1994). It confirmed that default risk of debt decreases earnings response coefficient on the basis that earnings provide information about the value of the complete firm, not only the value of equity. The factor affecting the ERC, the impact of systematic risk has been found statistically significant and negative (Azizi et al., 2016; Collins & Kothari, 1989; Zakaria et al., 2013a). Systemic Risk (Beta) is used as the measurement of risk and also mentioned the volatility into the stock market. Systemic risk is uncontrollable and unavoidable; it can only be minimized by diversification. However, equity beta alone not captured all the levels or dimensions of risk related with equity.

The firm growth opportunities are very important factor for investor to make financial decision. The firm growth opportunities give positive signal into the market which attracts the investors. The growth of the firm may also increase the earnings response coefficient of the firm. The earnings response coefficient another important determinant is firm size. It is calculated or measured in a number of ways such as the value of total assets, value of sale, and number of employees. Firm big size provides positive signal into the market and become the cause of increase in earnings response coefficient.

Profitability is the factor that influence on ERC. Profitability is the ability of a company to make profit in an attempt to increase shareholder value. When profitability increased, this shows an increase in profit. Therefore, investors are interested to invest in these stocks. The

results of the different studies showed a positive relationship between profitability and ERC. Investors are also considering the return on asset, because it only shows the rate of return on the assets owned by the company (Azizi et al., 2016). This study used the ROA ratio as the proxy to measure the profitability of the firm. Another factor which is the key determinant of ERC is the financial leverage. Liability can be measured with leverage, which can influence the ERC. The company with high degree of leverage can increase its earnings, benefited its debt holders and shareholders, then influenced the negative response to the investors as mentioned by Dhaliwal, Lee, and Fargher (1991). Therefore, the study examined the effect of financial leverage on ERC. The existing literature showed that financial leverage has the negative and significant impact on ERC (Azizi et al., 2016).

In this study the impact of inflation rate and interest rate on earnings response coefficient tested first time which is recommended by (Al-Baidhani, Abdullah, Ariff, Cheng, & Karbhari, 2017b). Inflation rate is the general increase in price of goods and service. Due to inflation factor the products become expansive and purchasing power of buyer decreases. Increase in inflation rate in expected to have the inverse relationship with earnings response coefficient, increase in inflation rate decreases the ERC. Interest rate in very simple words the money paid on the use of assets. When banks and other financial institutions grant loan such institutions charged the inflation rate as well as the interest rate. It is also expected that interest rate has negative influence on earnings response coefficient.

The researchers of developed and the developing countries like Malaysia, Korea, China, Indonesia and Iran etc. have conducted the research on earnings response coefficient, but these researchers not study the determinants of ERC in depth. Now this study fulfills the research gap and includes the above discussed variables, which may affect the earnings response coefficient like systemic risk, default risk, firm size, growth opportunities, financial leverage, profitability, inflation rate and interest rate.

1.1.1 Earnings Response Coefficient

The earnings response coefficient defined by different researchers as Cho and Jung (1991) "ERC is the effect of a dollar of unexpected earnings on stock returns, and in principle, can be measured as the slope coefficient in the regression of abnormal stock returns on unexpected earnings". Feltham and Pae (2000) defined ERC is the statistical measure of strong market reactions to unexpected earnings of the firms and ERC in not an accurate measure of accounting earning information.

According to Zakaria et al. (2013a)"earnings response coefficient is measure of the extent to which stock prices react to earnings surprises". Hamane, Ardakani, and Abghari (2014) defined "the earnings response coefficient measures sensitivity of market reaction to the earning announcement by the slope of the regression between abnormal returns and unexpected earnings".

Al-Baidhani et al. (2017b) explained as "a measure of relation of stock returns to earnings surprises around the time of corporate earnings announcements" or "the relationship between a change in a company's stock price and any unusual statements in a company's earnings announcement".

1.2 Significance and Motivation of the Study

The research on earnings response coefficient is very important in the perspective of Pakistan because no considerable work has been done on earnings response coefficient in Pakistan. As Pakistan is a developing country its economic and political condition is not remained the stable. So, it is the need of the time to study the determinants of Earning response coefficient which are useful for the investors, creditors and the market. This research provides the different implications of ERC studies as the earnings response coefficient is helpful for investors or stakeholders to make informed stock decision. Implication of ERC study is to make availability of quality earnings information to financial statement user and main purpose of accounting is to provide investor and public with quality of financial information regarding business firm. Application of ERC studies is to extend or increase the knowledge to study more emerging markets and developed markets with regard to stock price effect. It is useful for corporate transparency as it is required at worldwide and Government level (Al-Baidhani et al. (2017b).

1.3 Problem Statement

The change in the earnings of the firm brings change in the return of the firm (Ball & Brown, 1968). Any other information related to firm specific variables like dividend announcement, new investments, future contracts may affect the return of the firm. However, some firms show different changes in the returns caused by unexpected earnings. Efficient market theory explains that investors respond rapidly to new information which coming into the market, which caused the stock prices, will adjust. It shows that both institutional investors and individual investors always follow the information and price movements into the market. The purpose of this study is to visualize the key determinants of the earnings response coefficient

from the non-financial sector of Pakistan. The determinants like default risk, systemic risk, firm size, growth opportunities, financial leverage, profitability, inflation rate and interest rate either have any impact (significant or insignificant) on ERC from non-financial sector of Pakistan.

1.4 Research Gap

Mashayekhi and Aghel (2016) examined the effect of firm size and earnings growth on ERC and recommended the inflation rate and interest rate for further studies. Azizi et al. (2016) have studied the impact of firm size, profitability, growth opportunities and leverage on ERC and suggested the inflation rate for future research. Al-Baidhani et al. (2017b) worked on earning response coefficient also proposed interest rate and debt to equity ratio for further research. The considerable work has been done in the other developed and developing countries of the world but as per my best knowledge no work has been done in Pakistan. However, the different variables showed different impact on ERC like the firm size and growth opportunities have not significant impact on ERC in the Indonesia economy (Suwarno et al., 2017) so, it's also the research gap to check the impact of key determinants on ERC in Pakistan.

Based on keen literature review and especially the mentioned studies, this study addresses the enormous study gaps including the times period i.e. which is choose for analysis. The research sectors i.e. non-financial sector of PSX. The variables as the inflation rate and interest rate which have not already been studied. However, as per my best knowledge no work has been done on earnings response coefficient in Pakistan.

1.5 Research Objectives

The study has the following main research objectives;

- To check whether the determinants i.e. default risk, beta, growth opportunities, profitability, firm size, financial leverage, interest rate and inflation rate are also the key determinants of ERC in non-financial sector of Pakistan.
- The basic objective or goal of the study is to find out the impact of the above-mentioned determinants either significant or insignificant on ERC from non-financial sector of PSX.

1.6 Research Questions

The current study has the following basic research questions in the study of ERC.

Q_1:   What is the impact of default risk on Earnings Response Coefficient of listed non-financial firms of Pakistan Stock Exchange?

Q_2:   What is the impact of systemic risk (beta) on Earnings Response Coefficient of listed non-financial firms of Pakistan Stock Exchange?

Q_3:   What is the impact of growth opportunities on Earnings Response Coefficient of listed non-financial firms of Pakistan Stock Exchange?

Q_4:   What is the impact of firm size on Earnings Response Coefficient of listed non-financial firms of Pakistan Stock Exchange?

Q_5:   What is the impact of firm profitability on Earnings Response Coefficient of listed non-financial firms of Pakistan Stock Exchange?

Q_6:   What is the impact of financial leverage on Earnings Response Coefficient of listed non-financial firms of Pakistan Stock Exchange?

Q_7:   What is the impact of inflation rate on Earnings Response Coefficient of listed non-financial firms of Pakistan Stock Exchange?

Q_8:   What is the impact of interest rate on Earnings Response Coefficient of listed non-financial firms of Pakistan Stock Exchange?

1.7 Thesis Organization

The complete thesis has been divided into five chapters. All these chapters provide knowledge about the research work in a well-defined manner. The first chapter about introduction regarding research work topic, basic concept, discussed the problem statement, research questions, importance of the study and objectives of the study. The second chapter is related to review of literature, in this section code all the theoretical and imperial background and existing research work supporting to this research work like dependent and independent variables and code the study of different counties which conducted in different time periods. The third chapter consist of research methodology, which discuss the population, sample size, source of data collection, conceptual framework, definition and measurement of variables. The fourth chapter is about data analysis and results interpretations. Results are interpreted in a proper manner as the descriptive statistics, correlation analysis and regression models step

by step discussed. The last or the fifth chapter is regarding findings of the study or conclusion, discussion and recommendations of research work.

CHAPTER NO.2

REVIEW OF LITERATURE

2.1 Theoretical Background

The existing literature mentioned that the following theories are supporting the study of Earning Response Coefficient as follows;

2.1.1 Efficient Market Theory

Fama (1970) classified the efficient market into three forms of weak form efficient markets, semi strong efficient markets, and highly efficient markets. A market in called an efficient market, if no one, both institutional investors and individual investors, could be able to earn abnormal return after adjusting for risk. In the efficient market both the individual investor and institutional investor have the same or equal information about the security and no one is in a position to obtain the abnormal return. The market is said to be efficient if the stock price can reflect all the information already available into the market. Efficient market implication is the stock price would react to the announcement of financial statements.

Weak form efficient market reflected already available information into the stock prices or historical prices of securities. Semi strong efficient market reflected the information of securities prices published in the financial statement. In highly efficient market, security prices reflected all content of information including the inside information.

2.1.2 Signaling Theory

Ross (1977) proposed signaling theory. It is developed to take into account the fact that inside manager generally have better and quicker information relating to current conditions and prospects compared to outside investors. This theory is based on the problem of asymmetric information between poorly-informed outside investors and well-informed managers, as managers do not convey full information on matters affecting company value. So, there is a tendency to give low ratings to companies of good quality and quality low. So generally the market will respond as a signal to a particular event that can affect the value of the company (Connelly, Certo, Ireland, & Reutzel, 2011). The financial signals may be the dividend

announcements, leverage, stock repurchase, announcement of merger or acquisition, and announcement of a tender offer etc.

2.1.3 Pricing Theory

The pricing theory is related to the earnings response coefficient studies. Mashayekhi and Aghel (2016) mentioned the pricing theory in ERC studies. Pricing theory was proposed by Roll (1977). Pricing theory states that there is relationship between the stock price and the existing information in the capital market regarding the public companies. According to theory, at the time of information announcement or information disclose the shareholders decision affect stock price. Therefore, the change in stock price is due to the announcement or disclose of information into the capital market. Price changes become the reason of stock return or equity return. ERC is the relationship or association of stock return and any unexpected earnings or surprise earnings announcements. Therefore, a firm stock price is related to information which is available to investors. As a result, news of surprise earnings leads to buying panic and news of low earnings leads to selling panic.

2.2 Empirical Background

The earnings response coefficient study is a favorite and continued interest topic of accounting and finance form the past six to seven decades. Different researcher done their work on this topic in different environments which are as under;

Initially, Ball and Brown (1968) related the accounting income with the stock price and evidenced by concentrating on the content of information which is unique to a particular organization. The study evidenced that stock prices adjusted the rapidly available information and change in stock prices and reflected the movement of information into the market. It documented the statistically significant and positive relationship between surprise earnings and abnormal return around the corporate earnings announcement. The study indicated that accounting earnings provide useful and positive information into the market and this work is helpful for investor's assessing the firm's ability to pay dividend. The study pointed out that the profit information of the firm is effective in proper decision making. Information which is provide by the firm earnings has a number of markets characteristics as return, volatility and volume changes around the firm earning announcements. The work of Ball and Brown (1968) open new door for the researcher to focus on earnings and returns relationship. A number of

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researchers extend their work and use their ideology and methodology for further working on returns and earnings relationship.

The study documented the relationship between size of the firms, content of price information and forecasted accounting earnings. They discussed that the stock prices play an important role for measuring the forecasted earnings. Used the price based earning measurement model and mentioned that the measurement model differ for large size and for small size firm. Firm size is the proxy or the measurement of firm available information for the numbers of traders and the analysts who process information for the corporation. The empirical results indicated that the firm outperforms, which has large size than small size firm. Empirical and theoretical study of finance and accounting suggested that the firm size may be strongly useful for the content of price information for future surprise earnings. Study suggested that a large number of professional and analysts process or use financial information of large size firms than the small size firm (Collins, Kothari, and Rayburn 1987).

Collins and Kothari (1989) discussed the relationship between accounting earnings and security return by using the event study or association study method. The event study focuses on the earning announcement causes investor to revises their cash flow expectations. It viewed by change in security prices measured or calculated over the short period of time around the earnings announcement. The study focused on the return over the longer period of time which is regressed on unexpected earnings. The study applied the reverse regression equation and unexpected earning as dependent variables and beta, growth, interest rate and earnings persistence as independent variables. The results indicated that the ERC is a negative function of systemic risk (beta) and as well as risk free interest rate. The study showed that the firm growth and firm size have positive impact on ERC. The firm size is the proxy for the information environment differences. Study used a sample of 9776 observations for the period of 1968 to 1982. The study used the equity valuation model; in the equity valuation model, stock price is the discounted present value of expected future dividend. The study relates the current accounting earnings to unexpected return (UR) via the use of earnings response coefficient.

The study predicted that ERC positively and significantly linked to revision coefficient (coefficient associated the current earnings to future earnings) and negatively related to rate

of return of the firm. They used the random coefficient regression model which offers results consistent with predications. These results are applicable for multiple regression models which associate the abnormal return (AR) and unexpected accounting earnings and other related variables. The existing studies mentioned and examined the relationship of the unexpected earnings and unexpected return, which is ERC, is considered to be same for all firms. But this study mentioned that the ERC cross-sectional differences in a predictable way. The variations in the expected rate of return in estimated cross-sectional by using the proxy of systemic risk. The study used the random coefficient model because it focuses or stress on variations in ERCs and also inferred the correlations among the time series parameters. The result mentioned that firm size and the revision parameters are positively associated with ERC, systemic risk and ERC are negatively associated (Easton and Zmijewski 1989).

Kothari and Sloan (1992) discussed the properties of earnings and ERC which is an important topic of accounting and finance. The result indicated that the time series properties of accounting earnings are mostly permanent in nature. It was also observed that for earnings and return the good results are obtained for long window than for small window of time. The study used the different time period (one year to four years, one quarter to 4th quarter) to check the impact on ERC. It confirmed that with the increase of time interval the ERC become strengthen. Moreover, the longer period is less biased estimate of ERC. The study showed that the presence of leading period rate of returns is sensitive to the ERC of the firm. It confirmed that ERC become more than double as leading period rate of returns are included in the price earnings regression. The study used the method of dividing accounting earnings by stock price at the beginning of return period. It is related to rate of returns in the way of price leading earnings, using quarterly and annually data. The regression analysis mentioned a significant and positive relationship between accounting earnings and rate of returns on measurement interval for one year and more.

Ali and Zarowin (1992) discussed the annual earnings and abnormal return (AR) relationship of the firm. The study estimated expected earnings by using the proxy of change in pervious year annual earnings. This process of estimating the unexpected earning by using the previous year earnings follows the random walk time series model. This shows that the annual earnings are completely permanent or non-transitory. The study showed that the transitory components of earnings, the change in earnings which is used as a proxy for UE

measurement, the ERC is causing to be biased towards zero. Due to such reasons, the ERC become potentially low. Moreover, the estimation error in ERC is negatively related with earnings persistence.

Choi and Jeter (1992) studied the qualified audit opinions or report impact on ERC of the firms. The study confirmed that qualified audit report impact on unexpected earnings and return relationship of the firm. The market response decreases after the issuance of qualified audit report. So, the qualified audit report may decline the earnings response coefficient of the firm. The qualified audit report provides adverse information into the market. Study used the direct regression model for the estimation of ERC for the time period of 1983 to 1986. The study included the pre and post qualification period which can mentioned changes in the economic environment.

In this study examined the economic determinants, the impact of earnings of the firm and the association between the change in earnings and stock return of the firm. They examined the cross temporal or cross sectional variations in earnings, variations in expected rate of return of the security and other variables. It predicted the positive relationship between accounting earnings changes, changes in risk and expected rate of return. The risk changes explained mostly by observed anomalous drift in prices after the earnings announcements. The study experienced the changes in risk of the firm during the period of one year before and one year after the accounting earnings changes. These risk fluctuations bring change in securities equilibrium expected rate of return with the condition of change in accounting earnings of the firm, and explained a portion of the post accounting earnings announcement drift in abnormal return (AR). The study focused on change in rents and change in expected returns as the factors affecting the earnings changes (Ball, Kothari, and Watts 1993).

Martikainen, Yli-Olli, and Gunasekaran (1993) confirmed the modeling relationship between the return and earning of the firm with the assumption of a homogeneous stock returns and accounting earnings association across corporations and over time. The earnings response coefficient study explained the inter-temporal variation due to macro-economic factors. The study mentioned that the macro-economic variables impact on the dividend, cash flows or pricing operator and inter temporal variations of ERC. The finished stock market result discloses some time series variations of ERC in the market. The result of the analysis shows

that the inflation rate and interest rate have the inverse relationship with ERC. Earning and return studies are divided into two groups as the association study and the event study. The event study is defined as a market in which the earning announcement has an impact on the future cash flow expectations of the investor. This is done by stock return reaction to accounting earnings announcement by using a small window i.e. only a few numbers of days.

Dhaliwal and Reynolds (1994) examined the impact of default risk of debt on the ERC by using the 11 years data from 1978-1988, 3587 firm years observations. This study applied the bond rating proxy for measurement of default risk. The study examined the hypothesis that earnings response coefficient is in negative relationship with default risk. The study mentioned that default risk has statistically significant and negative affect on ERC, while controlling the beta (systemic risk) and earnings persistence. The study also confirmed that debt to equity ratio is another method or proxy for default risk which also strengthened the results. It mentioned that systemic risk (beta) is unlikely to capture fully the discount rate. However, default risk may be an additional estimation proxy for the discount rate. Research applied the reverse regression equation to estimate the ERC. Unexpected earnings divided by stock price as dependent variable and CAR, beta, earnings persistence and default risk as independent variables.

Cheng (1994) examined the explicit earnings and return association by developing a simple framework model. The study developed the model to appreciate the information level of earnings which bring variation in return of the firm. Study mentioned or discussed the two main frameworks to estimate earnings and return relationship. These are the equity valuation model and the return model, the reduced form of pricing model. The models or frameworks have their own assumptions. The assumptions make the model easier and helped to developed hypothesis. However, the addition of assumptions in these models affects the reality or generalizability of these models. The equity valuation model has further four models which also have some assumptions. The first model is the general price and expected dividend model. Second model is the general price and expected earnings model. Third model is the simplified price and expected earnings model. Last and fourth model is the simplest price and constant expected earnings model. Their four assumptions are the relationship between dividend and earnings, constant expected future dividend, patterned expected future earnings and constant expected future earnings. The other valuation model is the return model, return

model worked on different setting as the return model without dividend, return model with dividend and the unexpected return model or abnormal return model. These models are applied or used to estimate the relationship between the earnings and returns.

Mande (1994) confirmed that earnings response coefficient, current dividend and future dividend are in relationship. The study confirmed that accounting earnings provides valuable information into the stock market. Moreover, the important question, how accounting earnings conveyed valuable information into the market is still under debate. The study concluded that the current accounting earnings are helpful for predicting future earnings. It also mentioned that information in dividend is substitute for accounting earnings. The result confirmed that dividend policies provide information which contained in current accounting earnings. The study used the three methods to relate the current earnings to dividend paying ability. A) A time series method, this relates current earnings to future earnings. B) A dividend earnings method, this relates future earnings with future dividend. C) A valuation method, this relates stock price with future dividend. The result indicated that earnings information is negatively associated with the information related to dividend. Furthermore, information of dividend is positively associated with information content of dividend. While, the result of dividend response coefficient (DRC) found to be weak.

Schroeder (1995) discussed on negative earnings response coefficient of the firms. The study discussed the situation or matters which provide the evidence on earnings response coefficient negative values or negative impact. The study stressed on situation in which accounting earnings unconditionally are good news, in a situation on condition are bad news. The informational interactions, examples include information transfer of intra-industry earnings announcements; increases banks' loan loss reserves, and information provided by cash flows conditionally on accounting earnings reports. However, it is mentioned that unconditionally the banks' loan loss reserves increases is a bad news. For example, the increase in earning of the firm is good news for competitor with the condition that with increase in earnings the size of the market increases. It also provided benefit to its competitors due to market size increases. The unconditional increase in earnings of the firm is bad news for its competitors because it increases in earning, as the result the competitor may also be suffered. The study used the simple and stylized two signal model for the

prediction of negative and positive ERC. It confirmed statistically strong evidence for cross sectional variations in ERC.

The researchers examined the impact in the capital market of short window procedure of pooled versus firm specific regression model. The study mentioned that by using random sample of corporation, the mean or average of the firm specific coefficient is 13th time greater than pooled CSRM (cross-sectional regression methodology), on average. Therefore, the firm specific coefficient is mostly greater than the CSRM ERC. The study proposed that the firms with a heterogeneous sample may have coefficients that are understated to be significant amount by using the CSRM. The study confirmed the firm specific ERC and unexpected accounting earnings variance to be negatively associated. Study calculated the unexpected earnings or surprise earnings in various ways and further checked the FSCM, CSRM and ratio impact. The UE various ways are the un-scaled unexpected earnings, price scaled unexpected earnings, forecasted scaled unexpected earnings and actual scaled unexpected earnings. The study used the different approaches to estimate different coefficient and inferences. These two important approaches are the firm specific coefficient methodology (FSCM) and Cross-sectional regression methodology (CSRM). In the FSCM approach for each firm separate ERC is calculated while in the CSRM uses all observations to calculate a single response coefficient for the sample or subset. It ignores ERC variations across firms. The results of the study indicated that the FSCM is more suitable and useful than CSRM approach, when corporations have different ERC and UE variances and both approaches suppose a linear association between UE and AR (Abnormal return) of the firm (Teets and Wasley 1996).

Martikainen, Kallunki, and Perttunen (1997) examined the presence of accounting losses have any impact on stock return and earnings relationship of Finland firms. The results mentioned that losses reduced the return and earnings association of the firms. The information regarding the firm earnings and losses is useful for investor for their financial decision making. Due to presence of losses the investors don't expect to continue with that firm in the future indefinitely. Because the shareholders have the liquidation option or choice on the assets of the firm, as the shareholder have the choice to liquidate the assets they don't want to continue with that firm indefinitely rather than to suffer from losses.

Hodgson and McCall (1998) found new evidence on accounting information asymmetry and relationship between small size and large size firms with the release of accounting earnings information or news. The study used the 65 firm data for analysis for the duration of 15th Feb. 1993 to 27th April 1993. Study divided the firm on the basis of large, medium and small size firms and checked their impact on preannouncement of information and post announcement of information. The study discussed more extensions regarding information and firm size of the firm. The study examined the impact of macro information on firm size and used the time series model. Study mentioned that the macro information has the stronger or greater impact on stock price changes for large size firms. However, the earnings news has the stronger impact on smaller size firms.

Feltham and Pae (2000) studied the impact of management private information and their accrual choice on variance of surprise earnings and ERC of the corporation. The study used the income valuation model to check the influence or impact of management private information and their accrual choice on the information received by the investor. The study assumed that the accounting policies impact the investor available information. The study documented that the ERC is dependent or relay on earnings persistence and in-formativeness of accounting earnings. ERC is the statistical measure of strong market reactions to unexpected earnings of the firms and ERC in not an accurate measure of accounting earning information. The results mentioned that the management private information and their accrual choice have the significant impact on ERC.

Park and Pincus (2001) examined the impact of internal source of funding and external source of funding on earnings response coefficient or either investigate equity financing has any significant impact or influence on abnormal return and unexpected earnings of the firm. The internally generated funds are less costly due to less or no transection cost and manager or investors information asymmetries. The funds which are generated externally by taking debt or by issuance of common share or preference shares are generated on cost and are not a good signal for the investors or the stakeholders of the firm. The phenomena mentioned that firms mostly preferred internally generated fund than externally generated funds. The study mentioned that the firm which has more internal funds has more value of ERC than firms which have more external funds. The study used the pooled and the cross-sectional regression model, by controlling the well-established determinants of ERC. The result confirmed that

the equity beta and the retained earnings ratio of the firms are negatively associated to contribute capital of the firms. Moreover, The ERC of more growth firms has more sensitivity to internal and external source of finance ratio than low growth firms, due to more manager and investor information asymmetry.

The study investigated the impact of multi-nationality of the firms with the relationship of unexpected earnings and unexpected return of 500 US multinational corporations for the period of 1995 to 1999. The researcher found a significant relationship between multi-nationality of the firm and the information regarding the earnings. With the high value of multi-nationality, the value of earnings response coefficient became smaller and less significant. The study measured the multi-nationality by using the proxy of foreign profit to total profit. The multinational firm has number of characteristics as the firm has large size, traded in the major stock exchange, a high ex-ante earnings uncertainty and having good quality of preannouncement information. The results of the study indicated that the degree or extent of unexpected security price changes is inversely related to the multi-nationality of the corporation (Riahi-Belkaoui 2002).

Willett, Kim, and Jang (2002) studied the factors which affecting the earnings response coefficient basically the default risk. Study processed or analyzed the data of 10 year from 1984 to 1993 for 160 US listed firms. The study used the direct multiple linear regression and cumulative abnormal return (CAR) as dependent variable. However, the default risk, unexpected earnings, beta, earnings persistence, growth opportunities, growth of EPS and standard deviation of EPS as independent variables. Default risk is estimated as dummy variable, the default risk assigned a value of 01 if that year change the value of debt and zero otherwise. The results mentioned that the default risk or change in debt has inverse impact on ERC. Systemic risk beta and standard deviation of EPS have also negative impact on ERC. However, growth opportunity, earnings persistence and EPS growth have showed the positive and significant impact on ERC in US economy. The study reported the adj. R-square is 23.2%. Study basically mentioned and focused on the direct equation. However, the reverse equation results also mentioned and discussed. Moreover, the study discussed the different concepts related in this study like ERC volatility, event versus association studies, replication and calibration of regression equation and general to specific approach etc.

Vassalou and Xing (2004) assessed the default risk impact on the equity return of the entity. A firm is said to be defaults when that firm is not in a position to meet its debts obligations. The studies checked the impact of default risk on equity of the firm, and focused on the ability of the default spread to explain or predict stock returns. The default spread is defined as the return or the differential between the treasury bonds and corporate bonds. The study measured the default likelihood indicators (DLI) for individual firms by using firm equity data. The study mentioned that the default risk is associated or related with size features of the firm and with book-to-market (BM) ratio. The study confirmed that book-to-market and firm size are both the firm default effect. Moreover, in the high default quintile, small size firm has much higher level of default risk than large size firm. However, the default risk decreases surprisingly as the firm size increases. Finally, it also concluded that high default risk firm gain higher rate of return than less default risk firms, with the condition that the firm have smaller size and have high book-to-market value. If these conditions are not fulfilled, these firms not gain higher returns. In addition, the accounting model not considered the volatility of assets for estimating the risk of default. It is very clear that the volatility of assets is very crucial for the probability of default.

Visvanathan (2006) confirmed that earnings response coefficient directly varies with the extant of earnings history which mentioned that earnings are closer to operating cash flows. This study used the regression equation model in which CAR as the dependent variable. Unexpected earnings, size of accruals, earnings persistence and firm size take as an independent variables. However, this association is significant and important. The findings confirm that the closeness to cash profile of earning is helpful for investor for assessment or judgment of earnings quality and current unexpected earnings of the firm. The earnings response coefficient (ERC) vary inversely by controlling the other determinants (e.g. firm growth, firm size, systemic risk etc.) with the relative size adjusted absolute value of accrual of quarterly reported earnings. It indicated that closeness to cash of property is an important determinant of earnings response coefficient.

Pimentel and Lima (2010) analyzed the importance of firm specific and pooled ERC of 61 public firms and use the data from 1995 to 2008 in the Brazilian market. The study also analyzed the lag structure of earnings and return. The research analysis based on two different measure of rate of return, and two different measures of accounting earnings and

applied the linear regression. The study mentioned that for firm regressions, few firms show a statistically significant relationship between accounting earnings and returns and for some companies a negative coefficient was occurred. It also indicates that the cross-sectional variance is more relevant in explaining the firm accounting earnings and return relation than the time series variance. The cross-sectional changes can be explained with a number of aspects such as corporate governance level, growth opportunities and or the entity risk specific. By controlling the cross-sectional factors or determinants may increase the explanatory power of ERC. The results confirmed that the cross-sectional variance is more appropriate than the time series variance to explain the earning and return relationship. The most amazing and wonderful thing in the results is that some significant coefficients have negative sign. It means that earnings variations and stock returns show an opposite or inverse relationship for some firms.

Cheng and Nasir (2010) reported the relationship between market risk, financial risk, price risk, foreign exchange risk and earnings response coefficient of banking sector. Study used the data for the time period of 2002 to 2008 for China Banks. The study used the direct regression model for analysis. The CAR is the dependent variable and the UE, liquidity risk, interest rate risk, solvency risk, credit risk, exchange rate risk, market risk and stock price risk as the independent variables. The financial risk included the liquidity risk, interest rate risk, solvency risk, and credit risk related with banks. The study applied the earnings and returns regression method and used the risk as a controlling factor. The earnings have strong impact on share price of commercial banks. The results indicated a statistically significant relationship between the rates of return to earnings of commercial banks. The liquidity risk has also statistically significant impact on rate of return and earnings relationship. The liquidity risk provided the information regarding the change in earnings in the return to earnings relation. The study mentioned that only financial risk has significant impact and other risk factors have no impact on China Banks it may be due to that investor not aware about these risks factors and bank manager manage these banks properly. The finding of the study confirmed that the liquidity risk can be reduced or minimized by the effective and proper assets and liability management.

The announcement of financial information has strong impact on stock prices of listed firms of Karachi Stock Exchange. The study used the model for the estimation and measurement of

abnormal stock return. The purpose of the study is that the financial information discussed or announce in annual general meeting provide signal to investor, regarding their investment decision, this information bring change in the mood of the investor and investor make proper decision in the light of information announced which as a result change or effect the stock price. This study supported that the current and past financial statement information is how to contribute to the firm value. The result confirmed that the investor in some cases, gain abnormal return due to leakage of financial information before the event day (Hussain & Hasan, 2010).

Ariff and Cheng (2011) worked on the earnings response coefficient in Asia Pacific countries i.e. Australia, Thailand, Korea and Malaysia banking sectors. The study discussed how disaggregated fee earnings and disclosures on total accounting earnings are utilized by investors to change in share price earlier to earnings disclosures. The information regarding total accounting earnings also affect significantly to share price in study Asia Pacific countries banking sector. Moreover, the disaggregated non-interest earnings are statistically significant on stock price in the Australian banks only. The study stressed on the earnings announcement information impact on stock price of commercial banks. Australian banks are the biggest banks and Thailand banks are the smallest and the remaining two countries are in between these countries. Size of the bank is estimated by the using the proxy of total assets. The study applied the direct regression model and used the CAR as dependent variable and standardized unexpected annual earnings (SUE) and non-interest income divided by total income as the independent variables.

Lu, Chin, and Chang (2013) used the data of 20 countries having more than 165,000 earnings announcements to check the impact of weather effect and response of the investor on earnings announcement of a firm. Some psychology factors like cloudiness, SAD and temperature affect investor mood. The research results indicate that the cumulative abnormal return (CAR) is related with unexpected earning and also with weather effect. In some countries investors reply less positively to bad earnings news when the accounting earnings news announced on cloudy days than on good or sunny weather days. On average the asymmetric weather impact is more significant for bad earnings news. Moreover, the country which having common law system and more financial information transparence and provide information of quality and quantity to investor, the extent of the weather effect is less in those

countries. The research proved that firm size and growth influenced on the earnings response coefficient.

Khaksarian (2013) discussed the relationship between the ERC and the earnings management. Study used the data of 250 listed firms from TSE for the period of 2006 to 2012. The study used the Olson's model for the measurement or estimation of earnings response coefficient and John's model for earnings management. John's model used the total accruals, total assets, change in revenues, change in accounts receivables and growth value of equipment to calculate the coefficient of earnings management. Olson's model used the closing stock price, book value of each share, ratio of debt to equity and net change in EPS to calculate the coefficient of ERC. The earnings management is an essential tool for investigating investor behavior and the value of stock price. The finding of the study confirmed that the earnings management has negative and significant association with earnings response coefficient.

Zakaria et al. (2013a) examined the impact of default risk in Malaysia on ERC for 362 listed firms for the period of 2006 to 2011. Use the regression model and the established determinants of earnings response coefficient which are used as control variable are the firm growth, beta, earnings persistence and firm size. It suggested that equity beta alone is not in a position to fulfill all the demission of risk related with equity. However, the default risk decreases ERC, on the basis that the accounting earnings provide information regarding the whole firm not just the value of shareholders' equity. The earnings response coefficient decreases by increasing the expected return rate, which is the common principle that higher risk with higher return. The study indicated that the default risk and systemic risk has negative impact on ERC. Study used the long-term debt to total shareholders' equity as proxy for default risk and also mentioned the bond rating as the proxy for default risk. However, firm size, earnings persistence and growth opportunities have the positive effect on ERC. The study pointed out that the ERC study is helpful for shareholders for making informed stock decisions. Moreover, the study of ERC is valuable for creditor, investors and the market.

Maditinos, Šević, Stankevičienė, and Karakoltsidis (2013) documented the relationship between the accounting information and the stock returns. Earnings response coefficient is defined as "the change in the stock price due to one-dollar change in accounting earnings".

The stock price is supposed to be the discount present value of future expected dividend or future cash flows. The study confirmed that there is a statistically significant association between accounting earnings and stock returns of the firms for large period of time i.e. for one year or more. Study used the cumulative model for estimation or measurement, and the accounting earnings were added up to four years and it generated higher ERC. However, the study also mentioned low ERC for short measurement time period of up to three quarters were applied. The finding of the study is useful for the investors, researchers, corporations, educators and regulators and also helpful for financial decision making. The value of losses is also very important when measuring the earning-return relationship and the impact of losses on ERC is also an important future direction.

The study confirmed the relationship between the sukuk (Islamic bond) rating and default risk on earnings response coefficient in Malaysia economy for the period of 2008-11 using the data of 255 firms. Sukuk mentioned the value of an asset, and also called the Islamic bond. Sukuk is the well-known method to raise finance into the market, in an islamically accepted way. The study checked the impact of sukuk rating while controlling the determinants of ERC as the firm size, growth opportunities, beta and earnings persistence. The study mentioned that sukuk rating has strong correlation with risk of default of the firm. The study used the reverse regression model and confirmed that sukuk rating has statistically negative significant impact on ERC. The regression equation has unexpected earnings divided by stock price as dependent variable and CAR and control variable as independent variables. Moreover, Malaysia has the well-known popularity to raise finance by issuing the sukuk or Islamic bond. The study reported the adjusted R square 22.2% with Sukuk rating (Zakaria, Isa, and Abidin 2013b).

Yu-Yin and He-Yuanlong (2013) documented the relationship between ERC and firm abnormal earnings growth. The study investigated the relationship of one year, two years and three year consecutive positive annual earning influence on the earnings response coefficient. The result mentioned that positive abnormal earnings growth (AEG) of the firm increase the ERC of the firm as compared to those firms which have less abnormal earnings growth. The study focused on the accounting earnings quality of the firm by return and earnings relationship. The mostly used tools to measures of earnings quality are accrual quality, earnings volatility and earnings persistence. The firm with positive return for consecutive 3

years or more has higher value of abnormal earnings growth. The study documented that as per valuation analysis, the equity premiums are higher for firm which have positive abnormal earnings growth and meet or beat the analyst expectations. Furthermore, the study confirmed that firm has higher future earnings quality or performance as the firm has positive forecast abnormal earnings growth history than other firms.

Hasanzade, Darabi, and Mahfoozi (2014) investigated the determinants which impact on earnings response coefficient of 202 list companies of Iran for the period of 2006 to 2012. The study used the earnings response coefficient as the dependent variable and is measured by the market response to unexpected profit coefficient of the firm to the change of market response profit coefficient method. The goal of the study is to answer the question, either the financial leverage, systemic risk (beta), quality of earnings and profitability affecting ERC of Iranian firms. The result of the study documented that the profitability, firm growth opportunities and quality of accounting earnings has positive and direct relationship with earnings response coefficient. However, the systemic risk (beta) has negative and inverse relationship with earnings response coefficient, the result consistent with (Zakaria et al., 2013a). Financial leverage has no impact on ERC. Moreover, the study used some different or new proxies to measure the variables as the dependent variable ERC is estimated by using two models, From these two models, one is used which provides high explanatory power. From these two models, one is used which provide high explanatory power. First, the market response to the unexpected part of profit coefficient model and second the market response to the profit changes coefficient model. The earnings quality used the proxy of operating profit to cash flow from operating activities. Financial leverage estimated by total debt to total assets. Firm size is calculated by using the proxy, natural log of the market value of equity for every selected firm for analysis.

Kwag (2014) investigated the fair disclosure of stock price information relationship with the earnings response coefficient (ERC). The fair disclosure regulation fully supports the stock price information should be fully disclosed to investors and all the stakeholders and the fair disclosure regulation prevent insider trading. This study investigated the behavioral shift in the investor reaction to earnings and after the fair disclosure as the information asymmetry increase due to FD of stock price information or earnings announcements. The study confirmed the behavioral shift by using the descriptive and pooled or panel data regression

analysis. The study suggested that the investors or the stakeholders react after the fair disclosure to the biased accounting earnings forecasts. However, the fair disclosure also affects the investor decision making process. In this scenario, the investor become more active after fair discloser and placed a discount during the earning announcement period on optimistic earnings forecasts. It is less or not possible that the investors place a premium on pessimistic forecasts.

The study confirmed the relationship between ERC and audit quality of Nigerian firms. Audit quality was measured by the audit firm size, auditor tenure, audit fee and auditor client importance. This study mentioned that audit quality has significant impact on earnings response coefficient. This study recommended that the companies improve their audit quality by making a professional auditing system, proper code and conduct of audit system and develop best practices for quality of audit. The quality of earning can also be improved by cost control, sale growth and cost reduction policies. Signaling theory supported that firms with efficient performance disclose their financial information for the purpose to send good signal into the market. So, the firms with high quality of audit are more credible than low quality of audit firms, because it sends good signal to the market (Okolie 2014).

Hamane et al. (2014) documented the association between earnings response coefficient (ERC), earnings management incentives and cash flows. Earnings management incentive is measured or calculated by the using the following three methods as (a) value of equity, (b) book value of total-debt to total-assets and by (c) firm size. This study confirmed that the earnings management incentive has significant impact on earnings response coefficient. The ERC concept was developed as what factors affect the market earnings information. The study used the yields unexpected dividends as the proxy for ERC estimation and also used these variables in regression equation model as leverage, sale, debt, size and beta. The ERC measured the sensitivity of the market and it is useful for investor and creditors. The result indicated that the companies which have strong strategy to increase their revenue than those firm which have strategy to decrease their cost have larger value of earnings response coefficient.

Fah and Sin (2014) examined the association between the insurance company's growth opportunities and ERC in Malaysia for the period of 2007 to 2011. The study documented the

association between earned premium incomes, growth opportunities, net claim incurred, net investment income, total assets, total liabilities and commission paid factors of the insurance companies. The premium incomes, growth opportunities, net claim incurred, net investment income, total assets, total liabilities have no significant effect on growth opportunities of insurance companies. Among the discussed variables only commission paid has significant impact on growth opportunities. So, the results of the study indicated that the insurance firms can implement the commission paid or commission encouraged policy for better results.

Yohan-An (2015) examined the impact of default risk or debt impact on ERC. This study applied the data of 128 firm listed at Korean Stock Exchange for the period of 2000-2007, nine years data. The default risk is highly related to firm ERC, if accounting earnings provide complete and accurate firm information. Because bankruptcy risk is determined by bond holder and shareholder from unexpected earnings or wealth changes. The result of the study indicated that by controlling the firm growth ratio and market beta the ERC decreases for issue of new bond, and ERC increases for the redemption of issued bond. Study applied two models separately. First model regarding issue of new bond and second model is related to redemption of issued bond. First model (issue of new bond) reported the adj. R-square 18.8% and second model (redemption of issued bond) provide adj. R-square 14.6%. Study used the direct regression equation and CAR as dependent variable and unexpected earnings, growth and default risk as independent variables. However, the default risk (debt) has negative impact on earnings response coefficient of the firm and firm growth has significant and positive impact on ERC in Korea. For future research, some better proxy for default risk recommended for use.

Mahjoubi and Abaoub (2015) examined the impact of different earnings forecasting methods on ERC in the Tunis economy. The ERC measured the return sensitivity to the accounting earnings surprises. The term earnings surprises defined as the unexpected earnings of the firm, which is the difference between the realized earnings and forecasted earnings. However, the ERC is the market reactions in terms of change in price, which bring unite change in unexpected earnings. Moreover, the study used the three technical methods of earnings forecasting as the smoothing, random walk and cross sectional. These methods estimate the market expectations, which measured through earnings response coefficient. These methods incorporate accounting earnings and its return predictors, into a positive relationship. The

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results indicated that unexpected earnings are significant. The study pointed out the dominance of smoothing forecast method and after that the random walk and in the last is the cross sessional forecasting method. In the time series method, score of quality permitted to support smoothing forecasts method over those of random walk method.

Sayekti (2015) investigated the impact of strategic corporate social responsibility (CSR) has statistically significant and positive effect on financial performance of the firm and non-strategic CSR has statistically negative effect on firm financial performance. However, the strategic CSR has positive and significant impact on ERC while the non-strategic CSR have no impact on ERC of the corporation. The study mentioned that the shareholders like the disclosure of CSR information in the annual general reports or in the financial reports of the firms. The investor or stakeholders consider strategic CSR information as good news and a good signal for competent management. Its means the corporation is capable in aligning and balancing stakeholder interest and company interest as well. This good management quality means a good quality of earning, which increase the value of earnings response coefficient.

Pimentel (2016) analyzed the data of main five countries as Brazil, Russia, India, China and South Africa (BRICS) for long period of time, and examined the market reaction on earnings response coefficient. This study used the 31,159 firm years observations from 1995-2013. The study checked the impact or influence of unexpected accounting earnings non linearity, negative earnings, time horizon and firm size on earnings response coefficient of these countries firms. This study mentioned that the content of earnings information has minor impact on stock prices of the firms. However, study also confirmed that the factors affecting the earnings response coefficient differ across the countries and across the time. The study also confirmed that a) the nonlinear effects of unexpected accounting earnings on ERC are in a common trend as discussed or mentioned countries, and the Russia is not in common trend from all these countries. b) The negative earnings have impact on ERC only in Russia, Brazil and India. c) Firm size has significant impact only in China economy.

Mashayekhi and Aghel (2016) investigated the factor affecting the earnings response coefficient such as earnings growth, firm size, and earning persistence of 82 Iranian list firms for the period of 2001-12. These factors are considered to the moderator which impacts the return response coefficient and ERC. The result of the study confirmed that firm size and

earnings growth have positive and significant impact on earnings response coefficient. However, no significant relationship has been found between earnings persistence and earnings response coefficient. The big or large size companies disclose more information to the shareholders and capital market and reacts to these information and stock prices probably change consequently and this also affect the stock return of the firm. The big or lager firm expect more value of ERC and as well as the earnings growth expect more value of ERC, because earning growth disclose firm good performance and as a result expect more ERC. The study pointed out interest rate, inflation rate, revenue growth and degree of leverage for future research.

Azizi et al. (2016) worked on earnings response coefficient in different manufacturing sectors firms listed on ISX during 2010-2014. ERC is the regression coefficient of proxy of stock price and the accounting profit. The study applied the direct regression equation to estimate the ERC and used the firm size, financial leverage, profitability and growth as independent variables. The study confirmed the efficient market theory and signaling theory results that information published or issued by the entity responded by the stakeholders. The study concluded that the firm size increase ERC, Profitability increase ERC, Growth opportunities of the firm increase ERC and Financial Leverage lower earnings response coefficient. Therefore, the firm which has more assets or earnings does not necessary to have the high value of earnings response coefficient. The research mentioned that R-square value 45.5% which mean that study variables i.e. size, leverage, profitability and growth bring total change in ERC which is 45.5 percent. This study suggested inflation rate impact for further study which may impact on the return of the firm.

The study examined the association between unexpected earnings announcements, stock price reaction and firm size of listed 264 firms for the period of 2010 to 2011. The empirical result showed that the quarterly earnings announcements have no significant impact on stock price reactions in the mentioned period for Pakistani firms. It is verified that the abnormal return is positive and negative for favorable and unfavorable quarterly accounting earnings announcements respectively, and these abnormal returns are not significant statistically. The firm size has no association with price reaction and quarterly earnings announcements. However, when the selected firms are divided on the basis of size, the large or big size firms with favorable earnings announcements showed a positive Cumulative price pattern and for

small size firm with favorable earnings announcements showed or mentioned a negative cumulative price behavior (Tauseef 2016).

Nikbakht and Fazel (2016) analyzed the Tehran listed firms, forecasted earnings influence on earnings response coefficient for the period of 2009 to 2015 by using the data of 104 firms. This study tried to solve the problem or answer the question as either the future earnings response coefficient affected by the properties of forecasted EPS. According to results, horizon, precision or accuracy and type of the forecasted accounting earnings influence the future ERC. However, the study mentioned that earnings per share forecast issuance frequency is not significant. From this discussion the data is not related to investor of issuance frequency of the forecasted or predicted EPS. One of the most important ways for the capital market user is to use the forecasted earnings per share. The capital market activists are in a position to use the forecasted EPS for decision making purposes for an investment.

Al-Baidhani et al. (2017a) examined the new findings by using the portfolio method, the result showed; accounting earnings influence on share price as compared to the past reports of individual events studies. The ERC measures by using the individual method and portfolio method approach by using the regression study method and the event study method for financial and non-financial listed entities of Malaysia. This study used 308 firm of Malaysia for the period of 2001 to 2014. The result of the study showed that the earnings increases shows a positive and significant Cumulative Abnormal Return (CAR) and when the earnings decline which shows a negative and significant CAR. The earning increases in response the share price increases due to good news having positive effect and bad news of earnings decline share price which shows to stock prices to go down due to negative effect of bad news.

Al-Baidhani et al. (2017b) investigated the literature, theories, perspectives and models which supported the ERC studies. The research mentioned the different implications of ERC studies. a) The ERC is helpful for investors or stakeholders to make informed stock decision. b) Implication of ERC study is to make availability of quality earnings information to financial statement user and main purpose of accounting to provide investor and public with quality of financial information regarding business firm. c) Application of ERC studies is to extend or increase the knowledge to study more emerging markets and developed markets

with regard to stock price effect. d) ERC is useful for corporate transparency as it is required at worldwide and Government level.   The study mentioned that researchers used the different approaches as portfolio approach and individual stock approach. The study discussed different method to evaluate the ERC as the regression method and event study method. This study confirmed that the ERC study is useful for regulators, investors and the market. It also recommended the debt to equity ratio and interest rate for future research.

Farooq, Shehata, and Nathan (2017) documented the earnings response coefficient for listed non-financial entities of the Middle East and North Africa (MENA) region for the time period of 2003-13. MENA region includes the countries as, Jordan, Bahrain, Kuwait, Egypt, Qatar, Morocco, Saudi Arabia, Oman, United Arab Emirates and Tunisia. This study mentioned the ERC is statistically positive for all studied countries. The result of the study confirmed that the earnings response coefficient increases with increase in the time interval of the study and the earnings are also higher for long term investor in these study regions. It is mentioned that the explanatory power of analysis increases as the time interval of measurement increases. It is mentioned that accounting earnings are more valuable for those investors who invest for long period of time.   This study tried to find out the answer of these questions, either corporation disclose their financial information truly? Either stock price reflects full information to investors or stakeholders? Is there any specific relationship between reported earnings of the firm to the stock return? Moreover, the study also worked on the dividend response coefficient, and confirmed that DRC increase with the increase in time interval. The study investigated the behavior of ERC in various countries and in various industrial sectors.

Suwarno et al. (2017) examined the accounting earnings of the firm contains or provides the information of the stock price and the investor respond on the information which published or declared by the firm in financial statements. ERC is the measure of the market reaction over the information which is published by the firm in the financial statements. The study supported the efficient market theory and the signaling theory. The multiple linear regression and purpose sampling was used on listed manufacturing entities in the Indonesia economy for the period of 2013-15. Study checked some factors which affect the earnings response coefficient like the firm growth, firm size and profitability. The results of the study showed that firm size and firm growth have no impact or insignificant impact on ERC and the

profitability of the firm has statistically positive and significant impact on ERC. Study used the ERC as dependent variable and size, growth and profit as independent variables.

Ashton and Trinh (2018) evaluated the relationship of information content of earnings forecasts. Earnings information or data is useful for fundamental valuation and for better assets allocation decisions. Accurate and proper earnings forecasts help to improve the quality of such decisions. Earnings forecasts are also a great challenge because the market expectations are not observable easily. Earnings response coefficient is also the generally accepted method to examine the price reaction to errors in the earnings forecast. This study mentioned that higher the earnings response coefficient (ERC) and better the model to capture the market expectations of earnings. This study divides the surprise earnings or unexpected earnings into adjustments based on alternative forecasting models and earnings surprises. This study confirmed that holding and buying the stocks creates statistically significant abnormal returns (AR). The analysis of the determinants of Earnings response coefficient provide the main basis for comparing competing models used in forecasting accounting earnings and these models also become the basis of equity valuation.

Sari, Paramita, and Taufiq (2018) investigated the impact of profitability, leverage and voluntary disclosure on ERC of listed manufacturing firm of Indonesia Stock Exchange. This study applies the purposive sampling and selected 51 firms for the period of 2014 to 2016. The results of this study confirmed that leverage has significant impact on voluntary disclosure and earnings response coefficient. However, voluntary disclosure has no impact on ERC. The profitability has no impact on ERC and voluntary disclosure. Moreover, profitability and leverage has significant impact on ERC through voluntary disclosure.

Most recently, Kim, Seol, and Kang (2018) checked the relationship between the corporate social responsibility (CSR) and ERC in the code of law tradition and the early stage of corporate social responsibility in the economy of Korea. The ERC is the combination of unexpected earnings and the unexpected return. So, the CSR and ERC association is expected to evaluate how well earnings reflect CSR implications. The existing studies on ERC and CSR show a positive relationship. This indicated that accounting earnings report the economic substance of CSR disbursements appropriately and effectively. The study mentioned that CSR and ERC have negative relationship. This implies that the consistence of

earnings and return decreases as a result the CSR increases. This also indicated that the earnings ability to CSR implication is lower under the early stage of CSR development and under the code of law circumstances. Study applied the two main or basic approaches to calculate the relationship of earnings and return. These approaches are narrow window approach and wide window approach. The narrow window approached is used to estimate the investor's response to earnings and wide window approach is suitable to investigate the relationship of stock return to earnings. This study has broadened the concept of CSR and ERC association in international capital markets.

Table 2.1

2.3 Prior Studies Comparison about Sample Size, Period, Variables and their impact

Sr. No.	Detail	Sample Size	Study Period	Study Variables	Impact of Variable
1	Suwarno et al. (2017)	---	2013-2016	*Size*	*Insignificant impact*
				Growth	*Insignificant impact*
				Profitability	Sig. and Positive.
2	Farooq, Shehata, and Nathan (2017)	---	2003-2013	ERC in different countries	ERC increase with time period increase.
				ERC in different industrial sectors	ERC increase with time period increase.
				ERC, Firms without dividends	ERC decrease with time period increase.
				ERC, Firms with dividends	ERC decrease with time period increase.
				ERC, Small Size Firms	ERC increase with time period increase.
				ERC, large Size Firms	ERC increase with time period increase.
				Dividend Response Coefficient (DRC)	DRC increase with time period increase.
				Free Cash Flow Response Coefficient (FRC)	FRC increase with time period increase.
3	Mashayekhi and Aghel (2016)	82 firms	2001-2012	Firm Size	Sig. and Positive.
				Firm Growth	Sig. and Positive.
				Earnings Persistence	*Insignificant impact*
4	Azizi et al. (2016)	42 firms	2010-2014	Earnings Growth	Sig. and Positive.
				Earnings Persistence	Sig. and Positive.
				Growth opportunities	Sig. and Positive.
				Leverage	Sig. and Negative.

#	Author	Sample	Period	Variable	Result
5	Pimentel (2016)	2290 firms	1995-2013	*Firm size*	*Positive and Significant impact only in China. However, no impact in Brazil, Russia, South Africa and India.*
6	Sayekti (2015)	136 firms	2005-2008	Strategic CRS	Sig. and Positive.
7	Yohan-An (2015)	128 firm	2000-2007	Default Risk	Sig. and Negative.
				Growth	Sig. and Positive.
8	Hasanzade et al. (2014)	202 firms	2006-2012	Quality of earnings	Sig. and Positive.
				Profitability	Sig. and Positive.
				Growth	Sig. and Positive.
				Systematic Risk	Sig. and Negative.
				Financial Leverage	*No Impact*
9	Zakaria, Isa and Abidin (2013)	362 firms	2006-2011	Default risk	Sig. and negative.
				Beta	Sig. and negative.
				Growth	Sig. and positive.
				Firm Size	Sig. and positive.
				High Leverage Firm	Low ERC
10	Kim, Willett and Jang (2002)	160 firms	1984-1993	Default Risk	Sig. and negative.
				Beta	Sig. and negative.
				Growth opportunities	Sig. and positive.
				earnings persistence	Sig. and positive.
				St. dev. Of EPS	Sig. and negative.
				EPS Growth	Sig. and positive.
11	Dhaliwal and Reynolds (1994)	3587 Obs.	1978-1988	Default Risk	Sig. and negative.
				Earnings persistence	Sig. and positive.
				Beta	Sig. and negative.
12	Collins and Kothari (1989)	9776 Obs.	1968-1982	Systematic Risk	Sig. and negative.
				Growth	Sig. and positive.
				earnings persistence	Sig. and positive.
				interest rate	Sig. and negative.

CHAPTER NO.3

RESEARCH DESIGN AND METHODOLOGY

This study used the regression analysis for panel data. However, for analysis statistical package E-views 9.0 software was used. Before analysis, study used some tests to check either the data is fit for analysis or not. For this purpose, following tests were run; test of normality, test of multicollinearity, test to remove the outliers, and check the significance of the correlation of the data.

3.1 Research Design

Research design is basically the research procedure or investigation plan. It deals with the research problem and finds the answer of the research question. Research design is divided into two parts as the qualitative research and quantitative research. This division of research design is based on research main characteristics. Qualitative research is used for inductive research approach and quantitative research is designed for deductive approach. This research is quantitative in nature so the deductive approach is used.

3.2 Population

The population of current study is firms under the non-financial sector, which are the textile, sugar, food, chemicals, manufacturing, electrical machinery, minerals products, cement, fuel & energy, coke & petroleum, other services and paper products sectors. Firms which are listed at Pakistan Stock Exchange from these sectors, the financial data were used for analysis. Every business firm in the Non-Financial sector listed at PSX was to be considered for analysis in this research.

3.3 Sampling Technique

In this research proportionate sampling technique was used on the basis of firms in each sector on the availability and fitness of firm data, and sample size drawn from non-financial sector firms listed at PSX. For this purpose the financial statement or the financial statement

analysis done by State Bank of Pakistan of non-financial sector firms were analyzed to measure all the desired variables of the study.

3.4 Sample Size

According to Hair (2007) 20 observations are enough for each variable. In this study there are eight variables. So, 160 firms were taken as sample for six years. The data analysis time period is from 2011 to 2016. The detail of non-financial sector firms and the sample size drawn through proportionate sampling technique is as follows; textile sector 42 firms, sugar 18 firms, Food 3 firms, chemical and pharmaceuticals sectors 15 firms, manufacturing sector 20 firms, mineral products 8 firms, cement sector 12 firms, motor vehicles and auto parts 9 firms, fuel and energy sector 10 firms, information communication and transport services sector 5 firms, coke and refined petroleum products 6 firms, paper paperboard and products 6 firms, Electrical machinery and apparatus 4 firms and other services activities sector 2 firms. These 160 firms are selected out of 378 firms, which are listed at PSX for the period of 2011-2016.

3.5 Data Collection Source

The study used secondary source of data. The data is quantitative in nature. Therefore, in this study the data was collected from many sources as from the Balance Sheet analysis done by the State Bank of Pakistan, Pakistan Stock Exchange website and annual reports of the firms of Non-Financial Sector listed at PSX for the period 2011 to 2016. The study used the descriptive statistics measures as mean or average, median and mode. It also includes maximum value, minimum value, correlation matrix, regression for panel data analysis was used. Brief descriptions of these analyses or tests are as under.

3.5.1 Descriptive Analysis

Descriptive data analysis provided the basic information regarding the data set. The raw data is mentioned to discuss or understand the basic nature of data. The descriptive statistics of data provide information regarding the data distribution, central tendency and data variability. This study applied some of these tools to present the data as the mean, median, mode, minimum value, maximum value, range, standard deviation etc.

3.5.2 Correlation Analysis

Correlation analysis is defined as it is the measure of strength, nature and direction of relationship between the two factors or predictors. The value of correlation between the variables may be positive or negative. However, these variables in correlation may be the dependent variable, independent variable or control variable. Moreover, correlation coefficient describes the nature and magnitude of the relationship between the variables. The value of correlation is in between +1 and -1. The magnitude (i.e. 0.45 or 0.77 etc.) describes the strength of the association between these two study predictors. The sign of the correlation value (i.e. positive sign or negative sign) describe the direction of relationship between two variables. Correlation analysis basically has three assumptions which are as follows; i) data have normal distribution. ii) The variables or predictors have linear relationship. iii) Causal relationship exists between predictors. The correlation standard criteria are as under;

Table 3.1: Correlation Coefficient Standard Criteria

	r values	Description
(i)	$r = +1$	There is perfect positive correlation between the predictors.
(ii)	$r = -1$	There is perfect negative correlation between the predictors.
(iii)	$r = 0$	There is no relationship between the predictors.
(iv)	$+\,0.75 \leq r < +\,1$	There is high positive correlation between the predictors.
(v)	$-\,0.75 \geq r > -\,1$	There is high negative correlation between the predictors.
(vi)	$+\,0.50 \leq r < +\,0.75$	There is moderate positive correlation between the predictors.
(vii)	$-\,0.50 \geq r > -\,0.75$	There is moderate negative correlation between the predictors.
(viii)	$+\,0.25 < r < +\,0.50$	There is low positive correlation between the predictors.
(ix)	$-\,0.25 > r > -\,0.50$	There is low negative correlation between the predictors.

Source: (Jain & Jhunjhunwala, 2006)

3.5.3 Regression Analysis

This study applied the regression analysis. Regression has two types as the simple linear regression and multiple linear regressions. In simple linear regression there is one dependent variable and one independent variable. While in multiple linear regression there is one dependent variable and two or more independent variables. In this study, there is one dependent variable as cumulative abnormal return and default risk, systemic risk, growth opportunities, firm size, profitability, financial leverage, inflation rate and interest rate as independent variables. The regression analysis provides the independent variable or variables

impact on dependent variable. The regression analysis has some assumptions which are data normality, stationarity and multicollinearity.

3.5.3.1 Data Stationarity

The first and foremost assumption of regression analysis is data normality. The data must be stationary/normal. If data is not normal then regression analysis cannot be applied. Different statistical tests can be used to check whether the data is stationary or not. In Eviews, the researcher can use Panel Unit Root Test to check the data normality and results of tests are considered for interpretation. These two tests included PP – Fisher Chi-Square test and Levin, Lin & Chu test. If statistic value of any of these tests is not significant then data is not stationary and researcher cannot precede the regression analysis.

3.5.3.2 Multicollinearity

The multicollinearity problem occurs when the variables or predictors has the high correlation with each other. Such high correlation or multicollinearity creates error in the measurement of data set. So, before applying the regression analysis it is needed to make sure that the variables have no issue of multicollinearity. Different tools of statistics are used to check the multicollinearity issue of data. This study used the results of correlation analysis to check the multicollinearity. The correlation criteria are mentioned in table 3.1.

3.5.3.3 Auto Correlation

Autocorrelation is a characteristic of data in which the correlation between the values of the same variables is based on related objects. It violates the assumption of instance independence, which underlies most of the conventional models. This study used the Durbin Watson to check the auto correlation of regression model.

The Durbin Watson test statistics value range from 0 to 4. If the value of Durbin Watson is 2 its means there is no autocorrelation. If the Value of Durbin Watson is from 0 to <2 there is positive autocorrelation. If Durbin Watson value is >2 to 4 there is negative autocorrelation.

A general rule of thumb is that if Durbin Watson test statistic value is in the range of 1.5 to 2.5, there is relatively normal autocorrelation. Source: ("Durbin Watson Test & Test Statistic," 2016)

3.6 Panel Data Analysis

The current study used the panel data analysis. Panel data is multi-dimensional data which has certain observations which are measured over some specific period of time. Panel data can be the combination of longitudinal data and cross-sectional data. Panel data has further two types as; i) Balanced Panel ii) Unbalanced Panel

3.6.1 Balanced Panel

The balanced panel measured all observation in all time periods. The determinants of earnings response coefficient studies is the balanced panel study. In this study all the variables are analyzed for 6 years and have total 960 firm year observations.

3.6.2 Unbalanced Panel

Unbalanced panel have some observations missing for some years. For example, if the cumulative abnormal return has 900 firm year observations and the unexpected earnings has 960 firm years observations such type of data is unbalance panel.

Panel data analysis has three types of method which are as under;

A) Common Effect Method
B) Fixed Effect Method
C) Random Effect Method

There are basically three models for panel data analysis, from these three models one is used for analysis which one is more reliable and suitable. A fixed effects method is a statistical method that represents the observed quantities in terms of explanatory variables that are treated as if the quantities were non-random. A fixed effects method is a statistical method that shows the observed quantities in a random effect. This method is also called a variance components model and is a kind of hierarchical linear model. It assumes that the dataset being analyzed consists of a hierarchy of different populations whose differences relate to that hierarchy. Terms of explanatory variables those are treated as if the quantities were non-random. A fixed effects method that represents the observed quantities are in a common effect.

3.7 Models Specification

As derived in appendix the model of ERC is as under;

$$UR = ERC * (UE/P) \qquad \qquad \text{(Equation-F)}$$

If, ERC is find out by the use of n variables X_1, X_2, X_3………X_n

$$UR = f(X_1, X_2, X_3, … … … , X_n) * (UE/P) \qquad \qquad \text{(Equation-G)}$$

The regression equation has the option of two methods of model specification as a) direct regression equation in which CAR is the dependent variable and b) reverse regression equation in which the unexpected earnings is dependent variable. In the reverse regression model the interpretation of result is difficult and the unexpected earnings have more volatility as compared to cumulative abnormal return. Therefore, in the light of above discussion chooses the direct regression model for data analysis.

This method is used by (Azizi et al., 2016; Dhaliwal et al., 1991) which is quite simple and easy is as follows;

$$CAR_{IT} = a + b_1 UE_{it} + \varepsilon$$

Putting the study variables like default risk, beta, growth opportunities, profitability, firm size, leverage, inflation rate and interest rate in above equation.

$$CAR_{IT} = a + b_1 UE_{it} + b_2 UE_{it} . DER + b_3 UE_{it} \cdot BETA + b_4 UE_{it} \cdot GRT + b_5 UE_{it} \cdot SZ +$$
$$b_6 UE_{it} \cdot P + b_7 UE_{it} \cdot L + b_8 UE_{it} \cdot INFL + b_9 UE_{it} \cdot IR + \varepsilon \qquad \text{(Equation-H)}$$

In this regression equation,

CAR = Cumulative Abnormal Return

UE = Unexpected earning

DER = Debit to Equity ratio (default Risk)

Beta = Systemic risk or equity beta

GRT = Growth Opportunities

SZ = Firm Size

P = Profitability

L = Financial Leverage

Infl. = Inflation rate and

IR = Interest rate

3.8 Study variables

Variables are said to be the important thing or item for valuable research work. The current study used the following variables as the unexpected earnings, cumulative abnormal return, default risk, beta, firm size, firm growth, financial leverage, profitability, inflation rate and

interest rate for this innovative research. These variables are selected or extracted after in depth study and research.

3.8.1 Dependent Variable

This study aimed to measured or estimate the earnings response coefficient. However, to measure the earnings response coefficient, two types of multiple linear regressions can be used as the direct regression equation or reverse regression. This study used the direct regression model mentioned in *(Equation-H)* which is the method of (Azizi et al., 2016; Dhaliwal et al., 1991). The direct regression model used the cumulative abnormal return (CAR) as a dependent variable to measure the ERC.

3.8.1.1 Earning Response Coefficient (ERC)

"Earnings response coefficient is the impact of unexpected earnings on stock returns of the firm and it can be calculated as the slope coefficient in the regression model of stock returns on unexpected earnings of the firm" (Cho & Jung, 1991). Earnings response coefficient derived in appendix, Equation-F as follows;

$$UR = ERC * \frac{UE}{P}$$

$$ERC = \frac{UR}{UE/P}$$

3.8.1.2 Unexpected Returns (UR)

Unexpected return is defined as the part of investment loss or gain which obtained or occurred after an unforeseen event. UR is estimated or calculated by using annual Cumulative Abnormal Return (CAR). CAR is "the aggregate rate of return that an investment has gained or lost in excess of the expected rate of return cumulated over a year" Zakaria et al. (2013a). UR is calculated or estimated by annual Cumulative Abnormal Return (CAR) as under;

The CAR is the average of the monthly abnormal returns of the firm and Abnormal Return is obtained by subtracting expected return form actual return as under;

$$Abnormal\ Return = Actul\ Return - Expected\ Return$$

The actual return is calculated for each firm stock price on monthly basis by using the formula as follow;

$$Actul\ Retrun\ (R_{it}) = \ln \frac{P_t - P_{t-1}}{P_{t-1}}$$

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The current study calculated or estimated expected return by using the Sharpe's 1963 market model. Monthly share prices and monthly KSE-100 Index data from KSE website was used to calculate monthly returns using the formula (Sharpe, 1963).

$$Monthly\ Return\ = Ln[\frac{Return\ Month_t}{Return\ Month_{t-1}}]$$

In the below equation putting the value of intercept and beta, then the market model calculated expected return for each company using 60 monthly returns;

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$E(R_{it})$= Expected rate of return for firm i for month t and

R_{mt}= Market rate of return i.e. KSE-100 index

α_i= value of intercept of actual return and KSE-100 index return for using 60 monthly return.

β_i= value of beta or slop of actual return and KSE-100 index return for using 60 monthly return.

For example, the expected return for 2011 is estimated or calculated by using the monthly returns estimated for Jan 2006 to Dec 2010. The abnormal return is then calculated by subtracting the expected return/estimated return from the actual return as:

$$AR_{it} = R_{it} - \hat{R}_{it}$$
$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt})$$

The annual CAR for 2011 is calculated by cumulating/averaging the abnormal return for the 12 months of 2011 and so on.

$$CAR_{it} = 1/N \sum AR_{it}$$

3.8.1.3 Unexpected Earnings (UE)

The unexpected earning or earnings surprise defined as earnings occurs when a company's reported annually or quarterly profit are above or below predictor's expectations. Therefore, the surprise earnings occurred due to some events or due to some confidential information which give return to investor above or below expectations. In the present study the unexpected earnings calculated as the change in annual earnings per share (current year EPS less previous year EPS) as under;

$$UE = EPS_t - EPS_{t-1}$$

For normality or average the unexpected earnings of the firm then divided by the previous year stock price as follow;

$$UE_t = \frac{EPS_t - EPS_{t-1}}{P_{t-1}}$$

UE_t = Unexpected Earnings of the firm for the year t

EPS_t = Earnings per share of current year t.

EPS_{t-1}=Earnings per share of the previous year as t-1

P_{t-1} = stock price of previous year t-1

3.8.2   Independent variables

The study has the following variables as the independent variables, default risk, beta, firm size, growth opportunities, financial leverage, profitability, inflation rate and interest rate. The expected impact or relationship of these independent variables with ERC is as under.

Table 3.2 Expected Relationship among the Variables

Sr. No.	Variable Name	Effect
1	Default Risk and ERC	Negative effect
2	Systemic Risk and ERC	Negative effect
3	Growth opportunities and ERC	Positive effect
4	Firm Size and ERC	Positive effect
5	Profitability and ERC	Positive effect
6	Financial Leverage and ERC	Negative effect
7	Inflation rate and ERC	Negative effect
8	Interest Rate and ERC	Negative effect

However, the different studies also mentioned some contradictory results. This may be due to different economic and political situations of the country. The detail and measurement of these independent variables is as under;

3.8.2.1 Default Risk

A firm is said to be going to default when that firm is not in a position to meet its debt obligations. In other words, default risk is the risk of the borrower not to pay its creditors on time and in full amount of debt. When a firm gets heavy amount of debt, such firm have to pay its interest as well as the principal amount to its creditor, if the firm is not in a position to

pay its interest and principal amount, it gives a bad signal into the market and value of the firm decline and as a result the firm become bankrupt. So, in this scenario, the study mentioned that default risk has the negative impact on earnings response coefficient of the firm. This current study apply the debt to equity ratio as the main/major measure of default risk (Zakaria et al., 2013a).

$$DER = \frac{Total\ Long\ Term\ Debt}{Total\ Equity}$$

3.8.2.2 Equity Beta

The equity beta is the measure of systematic risk. In other words, it measures the volatility of the security as compared to the market as a whole. However, the equity beta is used to measure the volatility or variation in market return of the firm. The systemic risk is also called the un-diversifiable risk or market risk. It is the common relationship that higher the risk, higher the return. Therefore, the earnings response coefficient decreases with the increase of systemic risk or beta. The ERC has the negative relationship with equity beta. The study used the capital asset pricing model (CAPM) to measure the equity beta (Zakaria et al., 2013a). The CAPM equation is as under;

$$E(R_{it}) = R_{ft} + [E(R_{mt}) - R_{ft}]\beta_{it}$$

$$\beta_{it} = \frac{E(R_{it}) - R_{ft}}{E(R_{mt}) - R_{ft}}$$

$$\beta_{it} = \frac{E(R_{it})}{E(R_{mt})}$$

β_{it}= Equity beta or systemic risk of the firm

$E(R_{it})$= Expected rate of return of the firm

$E(R_{mt})$= Expected rate of return of the market

R_{ft}= Risk free rate of interest

The prior studies Collins and Kothari (1989), Easton and zmijewski (1989) also mentioned that equity beta have negative relationship with ERC.

3.8.2.3 Growth opportunities

The earnings and return cross-sectional differences are due to the variability of growth (Collins and Kothari 1989). Growth opportunities are as the business opportunities, investing in such things which are profitable (Azazi et al 2016). The firm Growth opportunities are

estimated by using the proxy of market value of equity to book value of equity. This measurement method or proxy has been widely used in existing research. In current study growth opportunities of the firm measured by market value of equity to the book value of its equity (Zakaria et al., 2013a).

The said formula is as under;

$$\text{Market to Book Ratio} = \frac{Market\ Value\ of\ Equity}{Book\ Value\ of\ Equity}$$

However, it is mentioned that the firm growth has statistically positive and significant impact on earnings response coefficient. This is due to that growing firm gives more benefits to its investors or shareholders. High growth firms are in a position to fulfill their projects which is also valuable to shareholders and investors. High growth firms have more profitable opportunities to invest their funds internally so such firms may not be interested to pay large amount of divided.

3.8.2.4 Firm size

Firm size is a scale which can divide the small and large firm in a number of ways as total income, total assets and or the total capital of the firm (Azizi et al., 2016). The firm size is an important and valuable characteristic of the firm. The firm size provides too much information to its investors or shareholders as large firm has more transparency in financial information, high quality of audit and high financial performance which attract most of the investors and shareholders as compared to small size firm. Firm size is calculated by using a number of ways. Some basic and mostly used measures of firm size are firm capital (Dhaliwal & Reynolds, 1994), natural log of firm total assets (Azizi et al., 2016; Zakaria et al., 2013a) and total number of employees of the firm. The current study applies natural log of firm total assets as the main measure of firm size.

$$Firm\ Size = \ln(Firm\ Total\ Assets)$$

3.8.2.5 Profitability

Profitability is ability of a company making a profit at the level of sales, assets, and capital stock. In other words, profitability is ability of the company to increase shareholder value. A profit generated firm, attracts investor and shareholder. As a result, investment of the firm increases. Moreover, if a firm is not making a profit or making very low amount of profit in such firm investor are not satisfied so withdraw their funds. The firm profitability has

positive and significant impact on earnings response coefficient as mentioned in previous studies. The variable profitability in this study measured by using return on asset (Van Horne & Wachowicz, 2008), as follows;

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

3.8.2.6 Financial Leverage

Financial Leverage is defined as the amount of debt shows to finance its investments or the proportion of fixed income securities as the debt and preferred stock in the capital structure of the firm. Financial leverage is measured or calculated by using the proxy of total debt to total assets ratio (Zakaria et al., 2013a). Leverage variable in this study used debt on asset ratio (Hasanzade et al.; Van Horne & Wachowicz, 2008) and formulated as follows;

$$DAR = \frac{Total\ Liabilities}{Total\ Assets}$$

3.8.2.7 Inflation Rate

Inflation rate is the increase in prices of goods and services and as a result the purchasing power of the buyer is also falling. Due to inflation the products and services become expensive. Pakistan is a developing country and its economic condition not remains the stable. Pakistan economy faces day by day increase in prices of petrol, electricity, Sui gas and other utility bills etc. which become the main cause of increase in price of goods and services. When the price of oil increases in Pakistan, as a result the prices of other products ultimately increase. Inflation rate in year 2007 is 7.8%, in year 2008 is 12%, in year 2009 is 19.6% and in year 2016 the inflation rate is 2.86% which is quite low as compared to year 2007, 2008 and 2009. Earnings response coefficient may also be influenced by the inflation rate. It is expected that inflation rate has negative impact on ERC of the firm. Inflation rate for the current study periods as in year 2011 is 14%, year 2012 is 11%, year 2013 is 7.36%, year 2014 is 8.62%, year 2015 is 4.53 and in year 2016 is 3%.

3.8.2.8 Interest Rate

The interest rate is defined as "Interest rate is the amount being charged or expressed as a percentage of principal by a lender to a borrower for the use of assets". Interest rate for the current study periods as in year 2011 is 8.23%, year 2012 is 7.98%, year 2013 is 7.17%, year 2014 is 7.26%, year 2015 is 6.00 and in year 2016 is 4.83%.

3.8.2.9 Brief summary regarding measurement of variables

In this section discuss brief summary of all the study variables and their method of calculation or measurement. This is as under;

Table 3.3 Measurement of study Variables

Variable	Definition	Calculation/Measurement
(b) CAR	Cumulative abnormal return	AR is measured by subtracting the expected returns from actual returns. However, expected returns obtained or calculated from the sharp 1963 market model. Estimated over a period of 60 months preceding the relevant years over which abnormal returns are cumulated.
(a) UE/P	Unexpected Earnings deflated by stock price	UE calculated by the change in annual EPS (current year EPS minus previous year EPS) divided by previous year stock price.
(i) DER	Default risk	Debt to equity ratio, measured by dividing total long term debt to total equity.
(ii) Beta	Equity beta	Beta which is the coefficient of regression from the market model estimated using a 60-months estimation period.
(iii) Growth	Firm growth opportunity	Firm growth is estimated by the ratio of the market value of equity to the book value of equity.
(iv) Size	Firm size	FZ used the natural logarithm of firm total assets. (all values in thousands)
(v) Profitability	Firm profit	The ROA ratio is used to measure profitability as net income to total assets.
(vi)Leverage	Financial Leverage	The debt on assets ratio is used to measure the financial leverage as total liabilities to assets.
(vii)Inflation rate	General increase in prices of goods and services.	Inflation rates for the study period 2011 to 2016.
(viii)Interest rate	Money paid on the use of assets.	Interest rates for the study period 2011 to 2016.

3.9 Conceptual framework

The Conceptual framework give complete and accurate picture of the research work. It mention all the formal variable included in the research work. The conceptual framwork is the graphical representation of dependent and independent variables which may be supported by past theoris of research. In this conceptual model the Earnings response coefficient is the dependent variable while the default risk, systemic risk, growth, firm size, profitability, financial leverage, inflation rate and interest rate are the independent vaiables and need to check the impact of key determinants on ERC as follow;

INDEPENDENT VARIABLES

DEPENDENT VARIABLE

Default Risk (DER)

Systemic Risk (Beta)

Growth Opportunities (GRTH)

Firm Size (FS)

Earnings Response Coefficient (ERC)

Profitability (P)

Financial Leverage (Lev)

Inflation Rate (Infl.)

Interest Rate (IR)
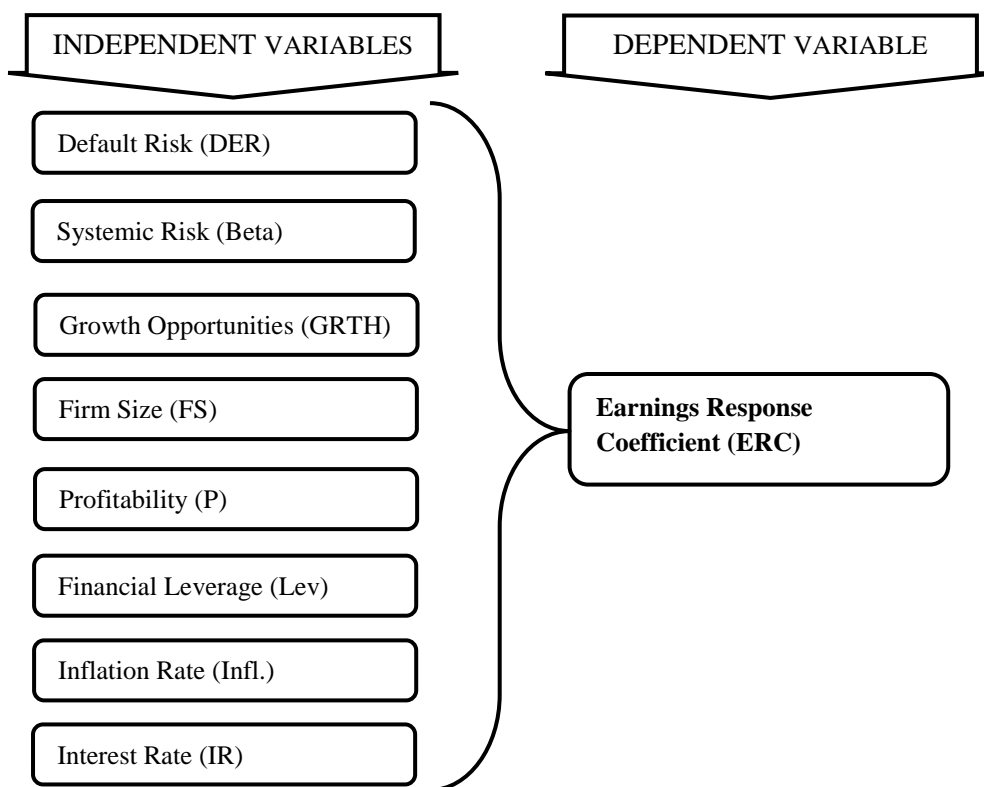
Figure 3.1 Conceptual framework

3.10 Hypotheses of the study

The Earnings Response Coefficient study has the following hypotheses;

H_1:   There is significant impact of default risk on Earnings Response Coefficient in listed non-financial firms of PSX?

H_2:   There is significant impact of systemic risk (beta) on Earnings Response Coefficient in listed non-financial firms of PSX?

H_3:   There is significant impact of firm growth opportunities on Earnings Response Coefficient in listed non-financial firms of PSX?

H_4:   There is significant impact of firm size (FZ) on Earnings Response Coefficient in listed non-financial firms of PSX?

H_5:   There is significant impact of profitability on Earnings Response Coefficient in listed non-financial firms of PSX?

H_6:   There is significant impact of financial leverage on ERC in listed non-financial firms of PSX?

H_7:   There is significant impact of Inflation Rate on ERC in listed non-financial firms of PSX?

H_8:   There is significant impact of Interest Rate on Earnings Response Coefficient in listed non-financial firms of PSX?

CHAPTER NO.4

DATA ANALYSIS AND RESULTS

This chapter elaborates the results obtained from the quantitative data analysis and reports the descriptive statistics, correlation matrix and regression results on the determinants of earnings response coefficient from non-financial sector of Pakistan Stock Exchange. In this section discussed the results of key determinants of ERC as default risk, systemic risk, growth opportunities, firm size, profitability, financial leverage, inflation rate and interest rate.

4.1 Descriptive Statistics

Table 4.1 below mentioned the descriptive statistics of the determinants of Earnings Response Coefficient. The table showed the values of maximum, minimum, range, median, arithmetic mean and standard deviation of key determinants of ERC. It also mentioned that the data has 960 firm year observations and sample size 160 non-financial firm listed at PSX.

Table 4.1 *Descriptive Statistics*

	Minimum	Maximum	Range	Mean	Median	Std. Dev.	Obs.
ERC	-72.6513	138.7794	211.4307	0.1688	0.0320	6.7056	960
CAR	-0.1148	0.1606	0.2754	0.0073	0.0035	0.0412	960
UE	-3.6486	2.8585	6.5070	0.0065	0.0069	0.4995	960
DRISK	-20.7000	104.4100	125.1100	0.6760	0.2200	4.2309	960
BETA	-4.7397	8.8971	13.6368	0.6903	0.6708	1.1645	960
GROWTH	43.0	431000.0	430957.0	15421.3	4503.0	34124.8	960
SIZE	11.1700	20.1900	9.0200	15.3950	15.3600	1.6155	960
PROFIT	-26.5600	53.8500	80.4100	6.4557	4.8800	10.8081	960
LEVERAGE	0.0100	2.4100	2.4000	0.5568	0.5500	0.2751	960
INFLATION	3.0000	14.0000	11.0000	8.0850	7.9900	3.7166	960
INTEREST	4.8300	8.2300	3.4000	6.9117	7.2150	1.1719	960

Table 4.1 has mentioned the value of Earnings Response coefficient (ERC) the minimum value -72.6513 (Asim Textile Mills Ltd. Year 2014) and maximum value 138.7794 (Pakistan Tobacco Co. Ltd. Year 2013) having the range of 211.4307. The ERC has the mean or the

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average value 0.1688 and standard deviation 6.7056. ERC standard deviation value represent that the value of ERC deviated 6.7056 from the central point.

The next study variable is Cumulative Abnormal Return (CAR) has the minimum value -0.1148 (Asim Textile Mills Ltd. Year 2014) and maximum value 0.1606 (Pakistan Tobacco Co. Ltd. Year 2013) having the range of 0.2754. CAR has the mean or the average value 0.0073 and standard deviation 0.0412. CAR standard deviation value represent that the value of CAR deviated 0.0412 from the central point. The next factor is the Unexpected Earnings or the surprise earnings, descriptive statistics represent that the UE has the minimum value -3.6486 (Dar Es Salaam Textile Mills Ltd. Year 2011) and maximum value 2.8585 (The Climax Engineering Co. Ltd. Year 2014) and their range is 6.5070. Unexpected earnings have mean value 0.0065 and median 0.0069. Standard deviation of the unexpected earnings is 0.6040.

Table 4.1 mentioned the values of default risk next to the unexpected earnings. Default risk is measured by using the ratio of long term debt to total equity. It shows the value of firm debt in terms of equity. Default risk has the minimum value -20.700 (Asim Textile Mills Ltd. Year 2013) and maximum value 104.4100 (Byco Petroleum Ltd. Year 2011). Maximum value represents that the firm has 104.4100 time debt as compared to equity. Range value of default risk is 125.11. Mean and median value of default risk is 0.6760 and 0.2200 respectively. Mean and median positive values shows that the non-financial firm of Pakistan mostly relay on debt. Due to heavy amount of debt the chance of default of the firm increases because the firm has to pay the heavy amount of interest as well as the principal amount of debt. The Next factor is the systemic risk (beta). Beta estimates the volatility in the return of the firm. Beta has the minimum value -4.7397 (Elahi Cotton Mills Ltd. Year 2012), maximum value 8.8971 (Brothers Textile Mills Ltd. Year 2014) and range 13.6368. Beta has the mean 0.6903 and median 0.6708. It has the standard deviation is 1.1645.

Growth opportunities are estimated by using the proxy of market value of equity to the book value of equity. Growth opportunities has the minimum vale 43.0000 (Brothers Textile Mills Ltd. Year 2011) and the maximum value 431,000.00 (Bata Pakistan Ltd. Year 2016). Range of growth is 430,957.00. It has the standard deviation 34,124.8. These values show that the firms have high growth and their average value is 15,421.3. Above table provides the values of Firm size has the minimum vale 11.1700 (Elahi Cotton Mills Ltd. Year 2011) and the maximum value 20.1900 (Oil & Gas Development Co. Ltd. Year 2016). Range of firm size is 9.0200. It has the standard deviation 1.6155 and their average is 15.3950.

According to table 4.1 the values of Firm profitability has the minimum value -26.5600 (TRG Pakistan Ltd. Year 2012) and the maximum value 53.85 (Pakistan Int. Container Terminal Ltd. Year 2016). Range of profitability is 80.4100. It has the standard deviation is 10.8081 and their average value is 6.4557. From table 4.1 the financial leverage has the minimum value 0.0100 (Diamond Industries Ltd. Year 2011) and maximum values 2.4100 (Balochistan Glass Ltd. Year 2016). Financial leverage is estimated by the ratio of total liabilities to total assets. Minimum value and maximum values shows that firms have more liabilities. Financial leverage has maximum value 2.4100 and minimum value 0.0100. Mean and median of financial leverage is 0.5568 and 0.5500 respectively. Financial leverage variable has the standard deviation 0.2751.

Table 4.1 represents next two macroeconomic factors, which are the inflation rate and interest rate. The inflation rate and interest has impact on the economy of Pakistan. Inflation rate has the maximum value 14% in year 2011 and minimum value 3% in year 2016. Inflation rate has the mean 8.08, median 7.9900 and standard deviation 3.71. Interest rate has the maximum value 8.23% in year 2011 and minimum value 4.83 in year 2016. Interest rate has the standard deviation 1.17, arithmetic mean 6.9117 and median 7.2150.

4.2 Correlation Analysis

The correlation matrix give an indication of how closely related or unrelated the variables under investigation are. Correlation analysis has been done to check the nature, direction and strength of relationship between the variables. The below table 4.2 provides the values of correlation matrix as under;

Table 4.2 *Correlation Matrix*

	ERC	CAR	UE	DRISK	BETA	GRTH	SIZE	PROF.	LEV	INFL	INT
ERC	1										
CAR	-0.0177	1									
UE	0.0071	0.1041	1								
DRISK	-0.0024	-0.0292	-0.0110	1							
BETA	-0.0285	0.0843	0.0121	0.0406	1						
GRTH	-0.0049	-0.0192	0.0047	-0.0452	0.0052	1					
SIZE	-0.0149	-0.0385	-0.0082	0.0673	0.2064	0.1850	1				
PROF.	-0.0007	0.0198	0.1746	-0.1129	-0.0362	0.3144	0.1822	1			
LEV	-0.0392	0.0545	0.0509	0.1168	0.0333	-0.2015	0.0169	-0.5010	1		
INFL	-0.0031	0.0832	-0.0477	0.0156	-0.0309	-0.1779	-0.0790	0.0864	0.0739	1	
INT	-0.0090	0.1437	-0.0418	-0.0074	-0.0024	-0.1778	-0.0767	0.0895	0.0698	0.9476	1

Table 4.2 provides the values of variables correlation; the Earnings Response Coefficient (ERC) has the maximum correlation with financial leverage -0.0392, which is low negative correlation, its means that ERC has no high correlation with CAR, UE, default risk, Beta, growth opportunities, firm size, profitability, financial leverage, inflation rate and interest rate. However, ERC have the negative relationship with CAR, default risk, growth opportunities, firm size, profitability, financial leverage, inflation rate and interest rate. ERC has positive or direct correlation with unexpected earnings. The cumulative abnormal return (CAR) has the maximum correlation with interest rate 0.1437, which is low positive correlation, its means that CAR has no high correlation with ERC, default risk, Beta, growth opportunities, firm size, profitability, financial leverage, inflation rate and interest rate. However, CAR has the negative relationship with ERC, default risk, growth opportunities and firm size. CAR has positive or direct correlation with UE, beta, profit, leverage, inflation rate and interest rate. The next factor is the unexpected earnings. Unexpected earnings have the highest correlation 0.1746 with firm profitability which is low positive correlation. Moreover, the unexpected earnings have positive or direct relationship with ERC, CAR, growth opportunities, systemic risk, profit and financial leverage. Unexpected earnings have negative correlation with default risk, firm size, inflation rate and interest rate.

The next study variable is default risk. The table mentioned that the default Risk has the highest value of correlation 0.1168 with financial leverage which is a low positive correlation. Minimum value of correlation is -0.0074 with interest rate. Default risk has

negative relationship with CAR, UE, Growth, profit and interest rate and has positive relationship with beta, size, financial leverage and inflation rate. The systemic risk or equity beta also has no high correlation with other variable as shown in table 4.2 (A). Beta has the highest correlation with size is 0.2064 and minimum correlation -0.0024 with interest rate, these are the low positive and negative correlations. System risk (Beta) has positive or direct relationship with CAR, UE, default risk, firm size, growth and leverage. It means that the systemic risk increases with the increase in CAR, UE, firm size, growth and leverage. However, the systemic risk has negative or inverse relationship with growth opportunities, profit, interest rate and inflation rate.

Table 4.2 the predictor growth opportunities have no high correlation with other study variables. Firm growth has positive and direct relationship with UE, beta, firm size and profitability. However, firm growth has highest correlation with firm profitability is 0.3144 having low positive correlation with profitability and lowest correlation with UE 0.0047. Growth opportunities have negative or inverse relationship with CAR, default risk, leverage, inflation rate and interest rate and have positive relationship with UE, beta, size and profitability. According to above table firm size has the highest correlation with firm growth which is 0.1850 and minimum correlation with unexpected earnings which is -0.0082, these correlations results shows low positive or negative correlations. Firm size has direct relationship with default risk, beta, growth, profit and financial leverage and inverse relationship with ERC, CAR, UE, inflation rate and interest rate.

Firm profitability has the correlation 0.0198 with CAR and 0.1746 with unexpected earnings. Profitability has the highest correlation with profitability which is -0.5010. It has the direct or positive relationship with CAR, UE, growth opportunities, size, inflation rate and interest rate. It has the inverse relationship with default risk, beta, and financial leverage. The factor financial leverage has the correlation 0.0545 with CAR and 0.0509 with unexpected earnings. Financial leverage has the highest correlation with firm profitability which is -0.5010 so leverage has moderate negative correlation with firm profitability. It has the direct or positive relationship with CAR, UE, default risk, beta, size, inflation rate and interest rate. It has the inverse relationship with ERC, growth opportunities and profitability.

The last two predictors are the macro-economic variables which are the inflation rate and interest rate. Inflation rate has the highest correlation with interest rate is 94.76% which is a high positive correlation between these two predictors. Inflation rate has the highest correlation with interest rate, because interest rate already included into inflation rate. So,

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these two predictors have high correlation. However, inflation rate has the minimum correlation 0.0156 with default risk. Inflation rate has the direct relationship with CAR, profitability, default risk, profit, financial leverage and interest rate. It has the inverse relationship with UE, beta, growth and firm size. Interest rate has the minimum correlation -0.0024 with systemic risk beta. Interest rate has the direct relationship with CAR, profitability, financial leverage and inflation rate. It has the inverse relationship with ERC, UE, default risk, beta, growth and firm size.

4.3 Robustness of Results

The study used number of tests to check the normality of data or check either the data is fit for analysis or not. For this purpose, the study used these tests or assumptions as the statistical assumptions i.e. Heteroscedasticity, multicollinearity and sensitivity analysis.

Statistical Assumptions of Regression Analysis

4.3.1 Data Normality Test

To check the linearity, normality and independence of residuals, probability plots and histograms were tested for each regression equation. The histogram showed the normal distribution of data. Moreover, the probability plot showed that the data points lie mostly on diagonal line, showing no big deviation from the central point or normality. This study used the histogram for the purpose of normality. The histogram diagram shows that the data is normally distributed and data has the bell shape.
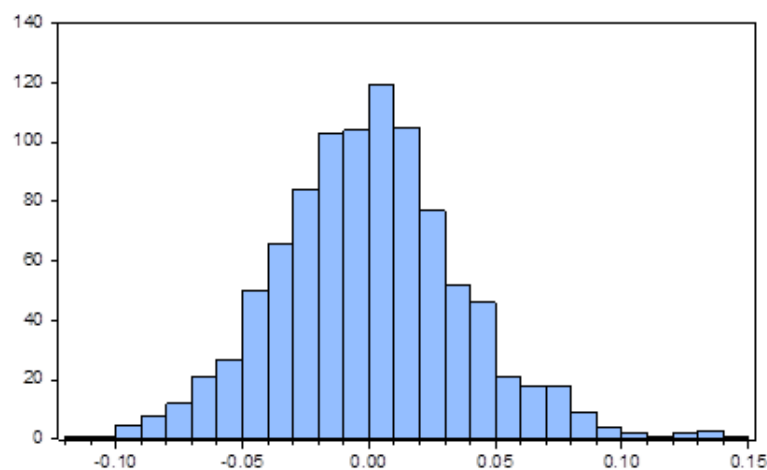
Figure 4.1 (Histogram)

4.3.2 Data Stationary Test

This study applied the unit root test to check the data stationarity. The below table 4.3 show the values of different tests of panel unit root test. There are many unit root tests like Levin, Lin &Chu t*, Im, Pesaran and Shin W-stat, PP - Fisher Chi-square a ADF - Fisher Chi-square nd. From these unit root tests the study reports the three important tests as Levin, Lin &Chu t*, Im, Pesaran and Shin W-stat, PP - Fisher Chi-square. These test results outcomes regarding stationarity or fitness of data are as under;

Table 4.3 *Unit Root Test Summary*

Variables	Levin, Lin &Chu t*	Prob.**	Im, Pesaran & Shin W-stat	Prob.**	PP - Fisher Chi-square	Prob.**
ERC	-46.2614	0.0000	-8.6593	0.0000	705.5160	0.0000
CAR	-28.0171	0.0000	-6.3825	0.0000	645.3290	0.0000
UE	-54.6489	0.0000	-14.5554	0.0000	982.8490	0.0000
UE*DRISK	-72.4076	0.0000	-17.6995	0.0000	979.7270	0.0000
UE*BETA	-52.7275	0.0000	-11.0652	0.0000	814.7520	0.0000
UE*GRTH	-31.6836	0.0000	-7.3448	0.0000	762.1150	0.0000
UE*SIZE	-53.5750	0.0000	-14.2616	0.0000	974.9200	0.0000
UE*PROFIT	-96.5968	0.0000	-23.5734	0.0000	1119.9200	0.0000
UE*LEV	-73.3450	0.0000	-16.1039	0.0000	990.3300	0.0000
UE*INFL	-166.8210	0.0000	-27.9228	0.0000	1194.8000	0.0000
UE*INT	-77.3788	0.0000	-17.2626	0.0000	1021.9400	0.0000

Table 4.3 mentioned the values of unite root test, the earnings response coefficient (ERC) variable Levin-Lin test statistics value -46.2614 and P-value 0.0000, Im-Pesaran test value -8.6593 P-value 0.0000 and PP - Fisher Chi-square test has the value of 705.516 P-value 0.0000 as the P-value of all these test is less than 0.05 which shows that the ERC is fit for analysis. Table 4.3 mentioned the cumulative abnormal return (CAR) Levin-Lin test statistics value -28.0171 and P-value 0.0000, Im-Pesaran test value -6.3825 P-value 0.0000 and PP - Fisher Chi-square test has the value of 645.3290 P-value 0.0000 as the P-value of all these test is less than 0.05 which mean that the CAR variable is fit for analysis. Unexpected earnings has Levin-Lin test statistics value -54.6489 P-value 0.0000, Im-Pesaran test value -14.5554 P-value 0.0000 and PP - Fisher Chi-square test has the value of 982.8490 P-value 0.0000 as the P-value of all these test is less than 0.05 which mean that the surprise earnings are fit for analysis or has normal stationary of data.

The next factor is default risk*UE. Its Levin-Lin test statistics value -72.4076 P-value 0.0000, Im-Pesaran test value -17.6995 P-value 0.0000 and PP - Fisher Chi-square test has the value of 979.7270 P-value 0.0000 as the P-value of all these test is less than 0.05 which mean that default risk*UE has normal stationarity of data. From table 4.3 beta *UE has the following unit root test as Levin-Lin test statistics value -52.7275 P-value 0.0000, Im-Pesaran test value -11.0652 P-value 0.0000 and PP - Fisher Chi-square test has the value of 814.7520 P-value 0.0000 as the P-value of all these test is less than 0.05 which mean that beta*UE data is fit for analysis.

Growth opportunities*UE has the following unit root test as Levin-Lin test statistics value -31.6836 P-value 0.0000, Im-Pesaran test value -7.3448 P-value 0.0000 and PP - Fisher Chi-square test has the value of 762.1150 P-value 0.0000 as the P-value of all these test are less than 0.05 which mean that growth*UE has normal stationarity of data. Table 4.3 mentioned that firm size *UE has unit root test values as Levin-Lin test statistics value -53.5750 P-value 0.0000, Im-Pesaran test value -14.2616 P-value 0.0000 and PP - Fisher Chi-square test has the value of 974.9200 P-value 0.0000 as the P-value of all these test are less than 0.05 which mean that growth*UE has normal stationarity of data.

It is shown that profitability*UE has unit root test as Levin-Lin test statistics value -96.5968 P-value 0.0000, Im-Pesaran test value -23.5734 P-value 0.0000 and PP - Fisher Chi-square test has the value of 1119.9200 P-value 0.0000 as the P-value of these test are less than 0.05 which shows that profitability*UE has normal stationarity of data. It is discussed that leverage*UE has unit root test as Levin-Lin test statistics value -73.3450 P-value 0.0000, Im-Pesaran test value -16.1039 P-value 0.0000 and PP - Fisher Chi-square test has the value of 990.3300 P-value 0.0000 as the P-value of these test are less than 0.05 which shows that leverage*UE data is fit for analysis.

The last two factors are the macroeconomics variables as the inflation rate and interest rate. The unit root test results of inflation*UE is Levin-Lin test statistics value -166.8210 P-value 0.0000, Im-Pesaran test value -27.9228 P-value 0.0000 and PP - Fisher Chi-square test has the value of 1194.8000 P-value 0.0000 as the P-value of these test are less than 0.05 which shows that inflation*UE data is fit for analysis and have normal stationarity. However, interest*UE test results are as Levin-Lin test statistics value -77.3788 P-value 0.0000, Im-Pesaran test value -17.2626 P-value 0.0000 and PP - Fisher Chi-squarte test has the value of 1021.9400 P-value 0.0000 as the P-value of these test are less than 0.05 which shows that interest rate*UE data is fit for analysis and have normal stationarity.

4.3.3 Multicollinearity Test

The multicollinearity problem occur when the variables or predictors has the high correlation with each other. From table 4.2 (A) all the variable has low correlation with each other. However, inflation rate and interest rate has high correlation with each other. As the inflation rate and interest rate has high correlation means has multicollinearity so, these variables tested in separate regression model. According to table 4.2 (B) unexpected earnings, firm size, financial leverage, inflation rate and interest rate has strong correlations and have high multicollinearity. So, these variables are tested in regression Equations separately in 04 different models.

4.3.4 Autocorrelation Test

This study tested the autocorrelation by using the Durbin Watson test. This study test results provides the value of Durbin Watson is 2.12 which show the normal autocorrelation which is acceptable. A general rule of thumb is that if Durbin Watson test statistic value is in the range of 1.5 to 2.5, there is relatively normal autocorrelation. Source: ("Durbin Watson Test & Test Statistic," 2016)

4.4 Panel Data Analysis Results

Panel data regression equation results are discussed in this section. The results of equation are mentioned in tables. The equation was already mentioned in the chapter of research methodology. The data test of normality, multicollinearity, correlation and auto correlation test results confirmed that the data is fit for analysis. This study first regression equation model is as under;

Model No. 01

The unexpected earnings multiplied with each independent variable. So, the chance of correlation increases and result may also be impacted due to this reason the model exclude the UE. In the same manner the firm size, financial leverage, inflation rate and interest rate have high correlation. So, unexpected earnings, financial leverage, inflation rate and interest rate variables not include in this model.

$$CAR_{it} = a + b_1 UE_{it} \cdot DRISK_{it} + b_2 UE_{it} \cdot BETA_{it} + b_3 UE_{it} \cdot GRTH_{it} + b_4 UE_{it} \cdot SZ_{it} + b_5 UE_{it} \cdot PROFIT_{it} + \varepsilon$$

The first regression equation model redundant variable likelihood ratio test is done for the purpose to check which panel data model is fit for analysis.

Table 4.4 (A) *Redundant Variable Likelihood Ratio Test for Model No. 01*

Redundant Fixed Effects Tests
Equation: EQ01_Size
Test period: fixed effects

Effects Test	Statistic	d.f.	Prob.
Period F	34.198575	-5,949	0.0000
Period Chi-square	159.04205	5	0.0000

From the above table 4.4 (A) mentioned the results of redundant fixed effects test which shows that the chi square statistic value is 159.0420 and P-value is 0.0000. This test result confirmed that fixed effect model is fit for analysis for this equation rather than common effect model. Now, this study use the Hausman test, to further check from these two models which one is most appropriate, either fixed effect model or random effect model. Hausman test result of regression equation is as under in table 4.4 (B).

Table 4.4 (B) *Hausman Test for Model No. 01*

Correlated Random Effects - Hausman Test
Equation: EQ01_Size
Test cross-section: random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	170.9928	5	0.0000

Table 4.4 (B) mentioned the Hausman test chi square statistic value is 170.9928 and P-value 0.00000. The P-value 0.0000 is acceptable. So, Hausman test results confirmed that fixed effect model is used to test the regression equation in Model No. 01.

Table 4.4 (C) *Regression Results for Model No. 01*

Dependent Variable: CAR
Fixed Effect Method

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006260	0.001238	5.055663	0.000000
UE*DRISK	-0.001044	0.000498	-2.098994	0.036100
UE*BETA	0.001037	0.001607	0.644952	0.519100
UE*SIZE	0.000411	0.000210	1.955928	0.050800
UE*GROWTH	0.000002	0.000001	2.469452	0.013700
UE*PROFIT	0.000715	0.000299	2.392814	0.016900
R-squared	0.181104		F-statistic	20.987720
Adj. R-squared	0.172475		Prob(F-stat.)	0.000000

Table above 4.4 (C) provides the regression equation results. These results are the main goal or center of study in this section. The regression equation has value of R- square is 0.1811 and adj. R-square 0.1724. The value of adj. R-square is equal to or smaller than the R-square value. R^2 and adj. R^2 do the same job. The difference between R^2 and adj. R^2 is that, if some irrelevant variables are included in the model the R^2 increases but adj. R^2 remain the same. The R-squared value is quite good in comparison to existing studies as (Zakaria et al., 2013a) reported the R squared 15.1%, (Visvanathan, 2006) mentioned the maximum R-Squared 4.9% and (Suwarno et al., 2017) discussed the R-Squared 04.60%. The value of R-square showed that all these factors as default risk, beta, growth opportunities, firm size and firm profitability has total impact 17.24% on earnings response coefficient. However, the R-square value may also be low because it is the study of unexpected earnings and unexpected returns.

As the occurrence of unexpected earnings and unexpected return are very rare. So, R-square value may also be low due to this reason. Table 4.4 (C) showed the F-statistic value 20.9877 and the Prob.(F-statistics) is 0.0000. Prob.(F-statistics) checked the overall significance of all the independent variables in the model. Prob.(F-statistics) value which is 0.0000 is highly significant at 5% significance level. From above table, C constant has the coefficient is 0.006260. This shows that if there is no independent factor in the model or the independent variables has zero value, the dependent variable CAR has coefficient 0.006260. The coefficient or the intercept has minor values. These minor values are due to the nature of the study as it is the study of unexpected earnings to unexpected return or abnormal return relationship, which is ERC. As the occurrence of unexpected earnings and abnormal return is limited, due to such reasons the variables coefficient has minor values. However, the past studies on ERC mentioned the similar coefficient values like (Visvanathan, 2006) and (Lu, Chin, and Chang 2013) which support this study coefficient results. Std. Error value is 0.001238. Std. error measured how reliable the coefficient is 0.006260. P-value which is 0.00000, mentioned that the coefficient is strongly significant.

Default Risk

The result of the regression equation shows that default risk has negative and significant impact on earnings response coefficient. The default risk coefficient is -0.001044, standard error 0.000498 and t-statistic -2.0989. The P-value of default risk is 0.036100. The p-value mentioned that the default risk is significant at 5% significance level. The results of this study are related or consistent with the previous studies as (Dhaliwal & Reynolds, 1994; Willett et al., 2002; Zakaria et al., 2013a). This study confirmed that the ERC decreases with the increase in default risk.

Hypothesis testing

Above table results mentioned that default risk has the P-value 0.036100 which is less than 0.05. So, the null hypothesis has been rejected and accepted H_1 as

H_1: There is significant impact of default risk on Earnings Response Coefficient in listed non-financial firms of PSX.

Systemic Risk (Beta)

The systemic risk has the coefficient 0.001037, standard error 0.001607 and t-statistic value 0.6449. The P-value of systemic risk (beta) is 0.5191. P-value shows that systemic risk has insignificant impact on ERC. The most of the existing studies showed the negative impact of beta on earnings response coefficient, but this study found the insignificant impact of beta on ERC. However, the determinants of ERC have contradictory results in different economies as firm size and the growth opportunities have not significant impact on ERC in the Indonesia economy (Suwarno et al., 2017) and a significant negative relationship was found for growth opportunities on ERC in Malaysia (Fah & Sin, 2014).

Hypothesis testing

From the above table results, Beta has the P-value 0.519100 which is greater than 0.05. So, the null hypothesis has been accepted 0.05 and rejected H_2 as;

H_2: There is significant impact of systemic risk on Earnings Response Coefficient in listed non-financial firms of PSX.

Growth Opportunities

This study confirmed that growth opportunities have positive and significant impact on earnings response coefficient. The predictor growth opportunities have the coefficient 0.000002, standard error 0.000002 and t-statistic value 2.469452. The P-value of growth opportunities is 0.013700. P-value mentioned that growth opportunities are strongly significant at 5% significance level. The previous studies documented the positive impact of growth opportunities on earnings response coefficient, which support our results as (Azizi et al., 2016; Mashayekhi & Aghel, 2016; Yohan-An, 2015; Zakaria et al., 2013a).

Hypothesis testing

Firm growth has the P-value 0.013700, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H_3 as

H_3: There is significant impact of firm growth on Earnings Response Coefficient in listed non-financial firms of PSX.

Firm Size

Table 4.4 (C) provides the result as firm size has significant impact on earnings response coefficient. The firm size has the coefficient 0.000411, standard error 0.000210 and t-statistic

value 1.9559. The P-value of firm size is 0.050800. Previous studies mentioned the positive impact of firm size on earnings response coefficient,

Hypothesis testing

Firm size has the P-value 0.050800, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H_4 as under;

H_4: There is significant impact of firm size on Earnings Response Coefficient in listed non-financial firms of PSX.

Profitability

As per above table 4.4 (C) provides the result of profitability. The profitability has the coefficient 0.000715, standard error 0.000299 and t-statistic value 2.392814. The P-value of profitability is 0.016900. P-value confirmed that firm profitability is highly significant at 5% significance level. It has statistically positive and significant impact on earnings response coefficient. The results of this study indicated that with increase in profit the ERC of the firm also increases. So, firm high profitability gives a positive or good signal into the market. The Existing studies reported the positive impact of profitability on earnings response coefficient, which support our results as (Azizi et al., 2016; Hasanzade et al., 2014).

Hypothesis testing

 Profitability has the P-value 0.016900, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H_5 as

H_5: There is significant impact of profitability on Earnings Response Coefficient in listed non-financial firms of PSX.

From the above results the following regression equation has obtained from table 4.4 (C) which applies to the non-financial sector of PSX.

$CAR_{it} = 0.006260 - 0.001044\ UE_{it}.DRISK_{it} + 0.000411\ UE_{it} \cdot Size_{it} + 0.000002\ UE_{it} \cdot GRTH_{it} + 0.000715\ UE_{it} \cdot PROFIT_{it} + \varepsilon$

This equation mentioned that if the value of UE*Size increase by 01 unite the ERC will be increased by 0.000411 and if the value of UE*Default risk increase by 01 unite the ERC decreased by 0.001044.

Model No. 02

$$CAR_{it} = a + b_1 UE_{it} \cdot DRISK_{it} + b_2 UE_{it} \cdot BETA_{it} + b_3 UE_{it} \cdot GRTH_{it} + b_4 UE_{it} \cdot PROFIT_{it} + b_5 UE_{it} \cdot LEV_{it} + \varepsilon$$

The regression equation model redundant variable likelihood ratio test is done for the purpose to check which panel data model is fit for analysis.

Table 4.4 (A) *Redundant Variable Likelihood Ratio Test for Model No. 02*

Redundant Fixed Effects Tests
Equation: EQ01_Leverage
Test period: fixed effects

Effects Test	Statistic	d.f.	Prob.
Period F	34.044736	-5,949	0.0000
Period Chi-square	158.382511	5	0.0000

Tabel mentioned the results of redundant fixed effects test which shows that the chi square statistic value is 158.3825 and P-value is 0.0000. This test result confirmed that fixed effect model is fit for analysis for this equation rather than common effect model. Now, this study use the Hausman test, to further check from these two models which one is most appropriate, either fixed effect model or random effect model. Hausman test result of regression equation is as under in table 4.4 (B).

Table 4.4 (B) *Hausman Test for Model No. 02*

Correlated Random Effects - Hausman Test
Equation: EQ01_Leverage
Test cross-section: random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	170.223679	5	0.0000

The Hausman test chi square statistic value is 170.2236 and P-value 0.00000. The P-value 0.0000 is acceptable. So, Hausman test results confirmed that fixed effect model is used to test the regression equation in Model No. 02.

Table 4.4 (C) *Regression Results for Model No. 02*

Dependent Variable: CAR
Fixed Effect Method

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006075	0.001238	4.908877	0.000000
UE*DRISK	-0.001067	0.000494	-2.161021	0.030900
UE*BETA	0.000841	0.001579	0.532494	0.594500
UE*GROWTH	0.000002	0.000001	2.563619	0.010500
UE*PROFIT	0.000841	0.000305	2.761780	0.005900
UE*LEVERAGE	0.009769	0.003735	2.615361	0.009100
R-squared	0.183686		F-statistic	21.354350
Adj. R-squared	0.175085		Prob(F-stat.)	0.000000

The regression equation has the value of R- square is 0.1836 and adj. R-square 0.1750. The value of R-square showed that all these factors as default risk, beta, growth opportunities, firm profitability and financial leverage has total impact 17.50% on earnings response coefficient. Table 4.4 (C) showed the F-statistic value 21.3543 and the Prob. (F-statistics) is 0.0000. Prob. (F-statistics) checked the overall significance of all the independent variables in the model. Prob. (F-statistics) value which is 0.0000 is highly significant at 5% significance level. From above table, C constant has the coefficient is 0.006075. This shows that if there is no independent factor in the model or the independent variables has zero value, the dependent variable CAR has coefficient 0.006075. Std. Error value is 0.001238. Std. error measured how reliable the coefficient is 0.006075. P-value which is 0.00000, mentioned that the coefficient is strongly significant.

Default Risk

The default risk coefficient is -0.001067, standard error 0.000494 and t-statistic -2.1610. The P-value of default risk is 0.030900. The p-value mentioned that the default risk is significant at 5% significance level. The result of the regression equation shows that default risk has negative and significant impact on earnings response coefficient. The results of this study are consistent with the previous studies as the (Dhaliwal & Reynolds, 1994; Willett et al., 2002; Zakaria et al., 2013a). This study confirmed that the ERC decreases with the increase in default risk.

Hypothesis testing

Above table results mentioned that default risk has the P-value 0.030900 which is less than 0.05. So, the null hypothesis has been rejected and accepted H_1 as

H_1: There is significant impact of default risk on Earnings Response Coefficient in listed non-financial firms of PSX.

Systemic Risk (Beta)

The systemic risk has the coefficient 0.000841, standard error 0.001579 and t-statistic value 0.532494. The P-value of systemic risk (beta) is 0.594500. P-value shows that systemic risk has insignificant impact on ERC. The most of the existing studies showed the negative impact of beta on earnings response coefficient, but this study found the insignificant impact of beta on ERC. Moreover, the factors of ERC have also insignificant impact in existing studies as firm size and the growth opportunities have not significant impact on ERC in the Indonesia economy (Suwarno et al., 2017).

Hypothesis testing

Beta has the P-value 0.594500 which is greater than 0.05. So, the null hypothesis has been accepted and rejected H_2 as;

H_2: There is significant impact of systemic risk on Earnings Response Coefficient in listed non-financial firms of PSX.

Growth Opportunities

The predictor growth opportunities have the coefficient 0.000002, standard error 0.000001 and t-statistic value 2.563619. The P-value of growth opportunities is 0.010500. P-value mentioned that growth opportunities are strongly significant at 5% significance level. This study confirmed that growth opportunities have positive and significant impact on earnings response coefficient. The previous studies mentioned the positive impact of growth opportunities on earnings response coefficient, which support our results as (Azizi et al., 2016; Mashayekhi & Aghel, 2016; Yohan-An, 2015; Zakaria et al., 2013a).

Hypothesis testing

Firm growth has the P-value 0.010500, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H$_3$ as;

H_3: There is significant impact of firm growth on Earnings Response Coefficient in listed non-financial firms of PSX.

Profitability

As per above table 4.4 (C) provides the result of profitability. The profitability has the coefficient 0.000841, standard error 0.000305 and t-statistic value 2.761780. The P-value of profitability is 0.005900. P-value confirmed that firm profitability is highly significant at 5% significance level. It has statistically positive and significant impact on earnings response coefficient. The results of this study indicated that with increase in profit the ERC of the firm also increases. So, firm high profitability gives a positive or good signal into the market. The Existing studies reported the positive impact of profitability on earnings response coefficient, which support our results as (Azizi et al., 2016; Hasanzade et al., 2014).

Hypothesis testing

Profitability has the P-value 0.005900, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H_5 as;

H_5: There is significant impact of profitability on Earnings Response Coefficient in listed non-financial firms of PSX.

Financial Leverage

The financial leverage has the coefficient 0.009769, standard error 0.003735 and t-statistic value 2.615361. P-value of financial leverage is 0.009100. The P-value mentioned that financial leverage is strongly significant at 5% significance level. The result indicated that the leverage has statistically positive and significant impact on ERC. While in the past study financial leverage has negative impact on ERC. Moreover, the factors of ERC have contradictory results in different economies as firm size and the growth opportunities have not significant impact on ERC in the Indonesia economy (Suwarno et al., 2017) and a significant negative relationship was found for growth opportunities on ERC in Malaysia (Fah & Sin, 2014). However, it is the first study on ERC in Pakistan according to researcher best knowledge. So, the behavior of ERC is not well defined in the economy of Pakistan.

Hypothesis testing

According to table results the financial leverage has the P-value 0.009100 which is less than 0.05. So, the null hypothesis has been rejected and accepted the H_6 as

H_6: There is significant impact of financial leverage on Earnings Response Coefficient in listed non-financial firms of PSX.

The following regression equation has been obtained from table 4.4 (C) which applies to the non-financial sector of PSX.

$$CAR_{it} = 0.006075 - 0.001067\, UE_{it}.DRISK_{it} + 0.000002\, UE_{it} \cdot GRTH_{it} +$$

$$0.000841\, UE_{it} \cdot PROFIT_{it} + 0.009769\, UE_{it} \cdot LEV_{it} + \varepsilon$$

This equation mentioned that if the value of UE*Profit increase by 01 unite the ERC will be increased by 0.000841 and if the value of UE*Default risk increase by 01 unite the ERC decreased by 0.001067.

$$CAR_{it} = a + b_1 UE_{it} . DRISK_{it} + b_2 UE_{it} \cdot BETA_{it} + b_3 UE_{it} \cdot GRTH_{it} +$$
$$b_4 UE_{it} \cdot PROFIT_{it} + b_5 UE_{it} \cdot INFL_{it} + \varepsilon$$

This regression equation model redundant variable likelihood ratio test is done for the purpose to check which panel data model is fit for analysis.

Table 4.4 (A) *Redundant Variable Likelihood Ratio Test for Model No. 03*

Redundant Fixed Effects Tests
Equation: EQ01_Infl
Test period: fixed effects

Effects Test	Statistic	d.f.	Prob.
Period F	34.138138	-5,949	0.0000
Period Chi-square	158.782999	5	0.0000

Table 4.4 (A) shows the results of redundant fixed effects test which shows that the chi square statistic value is 158.7829 and P-value is 0.0000. This test result confirmed that fixed effect model is fit for analysis for this equation rather than common effect model. Now, this study use the Hausman test, to further check from these two models which one is most appropriate, either fixed effect model or random effect model. Hausman test result of regression equation is as under in table 4.4 (B).

Table 4.4 (B) *Hausman Test for Model No. 03*

Correlated Random Effects - Hausman Test
Equation: EQ01_Infl
Test cross-section: random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	170.690690	5	0.0000

The Hausman test chi square statistic value is 170.6906 and P-value 0.00000. The P-value 0.0000 is significant. So, Hausman test results confirmed that fixed effect model is used to test the regression equation in Model No. 03.

Table 4.4 (C) *Regression Results for Model No. 03*

Dependent Variable: CAR
Fixed Effect Method

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006305	0.001241	5.079509	0.000000
UE*DRISK	-0.000938	0.000494	-1.898572	0.057900
UE*BETA	0.001611	0.001576	1.022249	0.306900
UE*GROWTH	0.000002	0.000001	3.117968	0.001900
UE*PROFIT	0.000656	0.000299	2.196650	0.028300
UE*INFLATION	0.000321	0.000272	1.179054	0.238700
R-squared	0.179005		F-statistic	20.691500
Adj. R-squared	0.170354		Prob(F-stat.)	0.000000

Above table shows the regression equation has the value of R- square is 0.1790 and adj. R-square 0.1703. The value of R-square showed that all these factors as default risk, beta, growth opportunities, firm profitability and inflation rate has total impact 17.03% on earnings response coefficient. The model has F-statistic value 20.6915 and the Prob. (F-statistics) is 0.0000. Prob. (F-statistics) checked the overall significance of all the independent variables in the model. Prob. (F-statistics) value which is 0.0000 is highly significant at 5% significance level. From above table, C constant has the coefficient is 0.006305. This shows that if there is no independent factor in the model or the independent variables has zero value, the dependent variable CAR has coefficient 0.006305. Std. Error value is 0.001241. Std. error measured how reliable the coefficient is 0.006305. P-value which is 0.00000, mentioned that the coefficient is strongly significant.

Default Risk

The regression result mentioned default risk coefficient is -0.000938, standard error 0.000494 and t-statistic -1.8985. The P-value of default risk is 0.057900. The p-value mentioned that the default risk is significant at 5% significance level. The result of the regression equation shows that default risk has negative and significant impact on earnings response coefficient.

Hypothesis testing

Above table results mentioned that default risk has the P-value 0.057900 which is less than 0.05. So, the null hypothesis has been rejected and accepted H_1 as

H_1: There is significant impact of default risk on Earnings Response Coefficient in listed non-financial firms of PSX.

Systemic Risk (Beta)

The systemic risk has the coefficient 0.001611, standard error 0.001576 and t-statistic value 1.0222. The P-value of systemic risk (beta) is 0.306900. P-value shows that systemic risk has insignificant impact on ERC. The most of the existing studies showed the negative impact of beta on earnings response coefficient, but this study found the insignificant impact of beta on ERC. Moreover, the factors of ERC have also insignificant impact in existing studies as firm size and the growth opportunities have not significant impact on ERC in the Indonesia economy (Suwarno et al., 2017).

Hypothesis testing

Beta has the P-value 0.306900 which is greater than 0.05. So, the null hypothesis has been accepted and rejected H_2 as;

H_2: There is significant impact of systemic risk on Earnings Response Coefficient in listed non-financial firms of PSX.

Growth Opportunities

The predictor growth opportunities have the coefficient 0.000002, standard error 0.000001 and t-statistic value 3.117968. The P-value of growth opportunities is 0.001900. P-value mentioned that growth opportunities are strongly significant at 5% significance level. This study confirmed that growth opportunities have positive and significant impact on earnings response coefficient. The previous studies mentioned the positive impact of growth opportunities on earnings response coefficient, which support our results as (Azizi et al., 2016; Mashayekhi & Aghel, 2016; Yohan-An, 2015; Zakaria et al., 2013a).

Hypothesis testing

Firm growth has the P-value 0.001900, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H$_3$ as;

H_3: There is significant impact of firm growth on Earnings Response Coefficient in listed non-financial firms of PSX.

Profitability

The profitability has the coefficient 0.000656, standard error 0.000299 and t-statistic value 2.196650. The P-value of profitability is 0.028300. P-value confirmed that firm profitability

is highly significant at 5% significance level. It has statistically positive and significant impact on earnings response coefficient.

Hypothesis testing

Profitability has the P-value 0.028300, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H_5 as;

H_5: There is significant impact of profitability on Earnings Response Coefficient in listed non-financial firms of PSX.

Inflation Rate

The result of the regression equation shows that inflation rate has no impact on earnings response coefficient. The inflation rate has the coefficient 0.000321, standard error 0.000272 and t-statistic value 1.179054. The P-value of inflation rate is 0.238700. Moreover, the factors of ERC have also insignificant impact in past studies as firm size and the growth opportunities have not significant impact on ERC in the Indonesia economy (Suwarno et al., 2017).

Hypothesis testing

Inflation rate has the P-value 0.238700 which is greater than 0.05. So, the null hypothesis has been accepted and rejected H_7 as;

H_7: There is significant impact of inflation rate on ERC in listed non-financial firms of PSX.

From the above results, the following regression equation has been obtained from table 4.4 (C) which applies to the non-financial sector of PSX.

$$CAR_{it} = 0.006305 - 0.000938\, UE_{it} . DRISK_{it} + 0.000002\, UE_{it} \cdot GRTH_{it} +$$
$$0.000656\, UE_{it} \cdot PROFIT_{it} + \varepsilon$$

This equation mentioned that if the value of UE*Profit increase by 01 unite the ERC will be increased by 0.000656 and if the value of UE*Default risk increase by 01 unite the ERC decreased by 0.000938.

Model No. 04

$$CAR_{it} = a + b_1 UE_{it} \cdot DRISK_{it} + b_2 UE_{it} \cdot BETA_{it} + b_3 UE_{it} \cdot GRTH_{it} + b_4 UE_{it} \cdot$$

$$PROFIT_{it} + b_5 UE_{it} \cdot INT_{it} + \varepsilon$$

The regression equation model redundant variable likelihood ratio test is done for the purpose to check which panel data model is fit for analysis.

Table 4.4 (A) *Redundant Variable Likelihood Ratio Test for Model No. 04*

Redundant Fixed Effects Tests
Equation: EQ01_Int
Test period: fixed effects

Effects Test	Statistic	d.f.	Prob.
Period F	34.153525	-5,949	0.0000
Period Chi-square	158.844714	5	0.0000

From the above table 4.4 (A) mentioned the results of redundant fixed effects test which shows that the chi square statistic value is 158.8447 and P-value is 0.0000. This test result confirmed that fixed effect model is fit for analysis for this equation rather than common effect model. Now, this study use the Hausman test, to further check from these two models which one is most appropriate, either fixed effect model or random effect model. Hausman test result of regression equation is as under in table 4.4 (B).

Table 4.4 (B) *Hausman Test for Model No. 04*

Correlated Random Effects - Hausman Test
Equation: EQ01_Int
Test cross-section: random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	170.762673	5	0.0000

Table 4.4 (B) mentioned the Hausman test chi square statistic value is 170.762673 and P-value 0.00000. The P-value 0.0000 is significant. So, Hausman test results confirmed that fixed effect model is used to test the regression equation in Model No. 04.

Table 4.4 (C) *Regression Results for Model No. 04*

Dependent Variable: CAR
Fixed Effect Method

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006292	0.001239	5.076334	0.000000
UE*DRISK	-0.000991	0.000495	-1.999174	0.045900
UE*BETA	0.001299	0.001594	0.814809	0.415400
UE*GROWTH	0.000002	0.000001	2.748138	0.006100
UE*PROFIT	0.000679	0.000298	2.278439	0.022900
UE*INTEREST	0.000649	0.000399	1.626149	0.104200
R-squared	0.180087		F-statistic	20.844040
Adj. R-squared	0.171448		Prob(F-stat.)	0.000000

Table 4.4 (c) mentioned the regression equation has the value of R- square is 0.180087 and adj. R-square 0.171448. This model has F-statistic value 20.8440 and the Prob. (F-statistics) is 0.0000. Prob. (F-statistics) checked the overall significance of all the independent variables in the model. Prob. (F-statistics) value which is 0.0000 is highly significant at 5% significance level. C constant has the coefficient is 0.006292. Std. Error value is 0.001239. P-value which is 0.00000, mentioned that the coefficient is strongly significant in this model.

Default Risk

The first predictor in regression mentioned default risk. It has coefficient value -0.000991, standard error 0.000495 and t-statistic -1.99917. The P-value of default risk is 0.045900. The p-value mentioned that the default risk is significant at 5% significance level. The result of the regression equation shows that default risk has negative and significant impact on earnings response coefficient.

Hypothesis testing

Above table results mentioned that default risk has the P-value 0.045900 which is less than 0.05. So, the null hypothesis has been rejected and accepted H_1 as

H_1: There is significant impact of default risk on Earnings Response Coefficient in listed non-financial firms of PSX.

Systemic Risk (Beta)

The systemic risk has the coefficient 0.001299, standard error 0.001594 and t-statistic value 0.814809. The P-value of systemic risk (beta) is 0.415400. P-value shows that systemic risk has insignificant impact on ERC. The most of the existing studies showed the negative impact of beta on earnings response coefficient, but this study report the insignificant impact of beta on ERC. Moreover, the factors of ERC have also insignificant impact in existing studies as firm size and the growth opportunities have not significant impact on ERC in the Indonesia economy (Suwarno et al., 2017).

Hypothesis testing

Beta has the P-value 0.415400 which is greater than 0.05. So, the null hypothesis has been accepted and rejected H_2 as;

H_2: There is significant impact of systemic risk on Earnings Response Coefficient in listed non-financial firms of PSX.

Growth Opportunities

The predictor growth opportunities have the coefficient 0.000002, standard error 0.000001 and t-statistic value 2.748138. The P-value of growth opportunities is 0.006100. P-value mentioned that growth opportunities are strongly significant at 5% significance level. This study confirmed that growth opportunities have positive and significant impact on earnings response coefficient. The previous studies mentioned the positive impact of growth opportunities on earnings response coefficient, which support our results as (Azizi et al., 2016; Mashayekhi & Aghel, 2016; Yohan-An, 2015; Zakaria et al., 2013a).

Hypothesis testing

Firm growth has the P-value 0.006100, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H_3 as;

H_3: There is significant impact of firm growth on Earnings Response Coefficient in listed non-financial firms of PSX.

Profitability

This study model reported the profitability results which have the coefficient value 0.000679, standard error 0.000298 and t-statistic value 2.278439. The P-value of profitability is 0.022900. P-value confirmed that firm profitability is highly significant at 5% significance level. It has statistically positive and significant impact on ERC.

Hypothesis testing

Profitability has the P-value 0.022900, which is less than 0.05. Therefore, the null hypothesis has been rejected and accepted H_5 as;

H_5: There is significant impact of profitability on Earnings Response Coefficient in listed non-financial firms of PSX.

Interest Rate

The interest rate has the coefficient 0.000649, standard error 0.000399 and t-statistic value 1.626149. The P-value of interest rate is 0.104200. The result of the regression equation shows that interest rate has no impact on earnings response coefficient. Moreover, the factors of ERC have also insignificant impact in past studies as firm size and the growth opportunities have not significant impact on ERC in the Indonesia economy (Suwarno et al., 2017).

Hypothesis testing

Interest rate has the P-value 0.104200 which is greater than 0.05. So, the null hypothesis has been accepted and rejected H_8 as;

H_8: There is significant impact of interest rate on ERC in listed non-financial firms of PSX.

The regression equation has obtained from table 4.4 (C) which applies to the non-financial sector of PSX is as under;

$$CAR_{it} = 0.006292 - 0.000991\, UE_{it}\,.\,DRISK_{it} + 0.000002\, UE_{it} \cdot GRTH_{it} +$$
$$0.000679\, UE_{it} \cdot PROFIT_{it} + \varepsilon$$

This equation shows that if the value of UE*Profit increase by 01 unite the ERC will be increased by 0.000679 and if the value of UE*Default risk increase by 01 unite the ERC decreased by 0.000991.

CHAPTER NO.5

CONCLUSION, DISCUSSION AND RECOMMENDATIONS

This study has investigated the factors affecting or the determinants of earnings response coefficient for non-financial firm of PSX for the period of 2011 to 2016. In this chapter, discussed the concluding remarks from this research work, discussion and recommendations.

5.1 Conclusion

This study has examined the determinants of earnings response coefficient impact on non-financial firms of Pakistan Stock Exchange. The determinants of ERC includes the default risk, systemic risk, growth opportunities, firm size, profitability, financial leverage and two macro-economic variables inflation rate and interest rate. Pakistan is a developing country; its economic condition was not too strong and economy of Pakistan has not stable political condition in the study period 2011 to 2016. Due to up and down in economic and political condition the earnings response coefficient study topic gain an additional importance. Moreover, the earnings response coefficient studies are beneficial to investors, creditors and the market. The ERC estimation or calculation is helpful for investors for financial decision making.

The results of the study documented that default risk has the significant and negative impact on earnings response coefficient. The study indicated that the default risk has inverse relationship with Earnings response coefficient, if the default risk increases the ERC decreases. Systemic risk (beta) has insignificant or have no impact on ERC. Beta measured the volatility in stock return. Moreover, firm growth opportunities, firm size and firm profitability have positive and statistically significant impact on ERC. The increase in growth opportunities, firm size and profitability increases earnings response coefficient. The result supports the efficient market theory and signaling theory. The more growth opportunities firm gives a positive signal into the market that the company has effective and efficient management and has proper use of resource due to such factors firm develop and as a result gain more and more growth. The high growth firm also provides a good signal into the

market and attracts the investors. So, firm growth has positive impact on earnings response coefficient and as well as the profitability has positive impact. The above results are consistent to some existing studies in different economies as (Collins & Kothari, 1989; Dhaliwal & Reynolds, 1994; Zakaria et al., 2013a). However, the financial leverage has positive and significant impact on earnings response coefficient. In previous studies the financial leverage has negative impact, but the non-financial firms of Pakistan Stock Exchange results indicate a significant positive impact. This shows that non-financial firms use the financial leverage in an efficient way and as a result the ERC increases with an increase in financial leverage. The macro-economic variables which are the inflation rate and interest rate, their impact are examined on ERC. This study results confirmed that inflation rate and interest rate have no impact or insignificant impact on ERC. Moreover, this is the first study in Pakistan on the topic of ERC. So, the behavior of different variables has not yet been completely defined.

Finally, it is concluded that the default risk has significant negative impact; growth opportunities, firm size, profitability and financial leverage has positive and significant impact; systemic risk, inflation rate and interest rate have no impact on earnings response coefficient.

5.2 Practical Implications

This study has many implications for the society especially for Pakistan, as by examining the determinants of earnings response coefficient, it is useful for investors, creditors, financial institutions and the market for better decisions making. The study of key determinants of Earnings Response Coefficient is very useful in financial analysis of the firm.

Following are the key implications of this research work.

- This study confirmed that non-financial firms improve their performance by maximizing the firm growth opportunities, firm size, profitability and financial leverage and also improve performance by minimizing or avoiding the default risk factors.
- This study implication is that the strong impact of earnings announcement on share price changes should enable investors to have confidence in the financial reports.
- The application of this study is to provide quality earnings information available to the financial statement users.

- The study of key determinants of Earnings Response Coefficient is very useful in financial analysis of the firm.
- The study of key determinants of ERC can be used to predict the impact on returns of changes by corporations in respect of reporting or operations.
- This study of key determinants of Earnings Response Coefficient is helpful in the investment decisions making for both the investor and the firm.

5.3 Discussion

The study has examined the determinants of earnings response coefficient of listed non-financial firms of PSX. The determinants as the default risk, systemic risk, growth opportunities, firm size, profitability, financial leverage, inflation rate and interest rate. This study used the direct regression model, and cumulative abnormal return as dependent variable. This study analyzed the 160 non-financial firms for the period of 2011 to 2016. ERC study belongs to many years old as six to seven decades. Different researchers work on ERC and extend this work to present period. First of all Ball and Brown (1968) discussed that earnings was not well defined and their utility was considered to be doubtful. They first time measured the empirical relation between the earnings and stock return at the period of announcement for US firms. After their work Collins and Kothari (1989) has done their prominent work on ERC. Their study results confirmed that the ERC value increases with the increase in cross-sectional time period or interval. Cheng (1994) developed a theoretical model to check the relationship between the earnings and stock returns in the field of accounting. Dhaliwal and Reynolds (1994) studied the impact of default risk on ERC and declared that the equity beta not showed all types of risks related to equity. However, the default risk provides some elements of risk related with equity. This interesting work also extended by (Zakaria et al., 2013a) and studied the impact of default risk on ERC in Malaysia. Result confirmed that the default risk has bad or negative impact on ERC and firm size growth and earnings persistence has significant impact on ERC. Al-Baidhani et al. (2017a) documented that the earnings changes information positively affect the share prices if the earnings per share increase and negatively impact the share price if the earnings per share decreases. Moreover, there are three financial statements to view as the balance sheet, income statement and statement of cash flows. All statements contain financial information which complement or similar to each other. So, these financial statements information can be used

in depth to check the behavior of ERC in the short period of time and for long period of time to gain benefit to stakeholder especially the investor and creditors.

Earnings response coefficient study through different researchers, through different economies and after different time periods reached in the economy of Pakistan. The earnings response coefficient study has quite satisfactory results in the non-financial sector of Pakistan Stock Exchange. The results of the study confirmed that default risk, growth opportunities, firm size, profitability and financial leverage has significant impact on ERC. But systemic risk, inflation rate and interest rate have no impact on earnings response coefficient. It documented that growth opportunities, firm size, and financial leverage have positive influence on ERC and default risk has negative and significant impact on earnings response coefficient.

5.4 Finding of the Study

The basic findings of the study are as follows;

- The default risk has significant negative impact on earnings response coefficient.
- The growth opportunities, firm size, profitability and financial leverage have positive and significant impact on Earnings Response Coefficient.
- The systemic risk (beta), inflation rate and interest rate have insignificant impact on earnings response coefficient.

5.5 Limitations of the Study

The current study has some limitations which are discussed below. The determinants of earnings response coefficient first time study in Pakistan. Therefore, in future researchers can conduct research in more vast level.

- This study used the data for six years for the period of 2011 to 2016.
- This research is conducted only in the non-financial sector of Pakistan with a limited sample size.
- The impact of more variables can also be studied on earnings response coefficients, which are not yet studied.

5.6 Future Directions and Recommendations

The main recommendations which extend the current studies are as follows;

- The study should be conducted where feasible for long period of time and for large number of firms.
- The earnings response coefficient studies should be carried out for financial sector.
- It is recommended that better proxies and more variables should be studied. Those are reliable and can strengthen the research results.
- It is suggested that the work on dividend response coefficient (DRC) should be conducted and also check the impact of working capital on ERC.

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APPENDIX

Derivation of Earnings Response Coefficient

The return and earnings studies started with the valuation model which related or connected the earnings and dividend Cho and Jung (1991). For example, all earnings and return studies used a model which discounted the future dividend or cash flows. In ERC studies, it is considered that earnings are closely associated to future dividends. So, the unexpected earnings may change the future dividend expectation of the investor which cause stock price changes (Collins & Kothari, 1989; Dhaliwal & Reynolds, 1994).

The earnings response coefficient (ERC) extracted from the equity valuation dividend discount model which followed by (Collins & Kothari, 1989) is as under;

$$Pit = \left[\sum_{k=1}^{\infty} Et(Di(t+k)) \prod_{\tau=1}^{k} \left\{ 1 / \left[1 + E(Ri(t+\tau)) \right] \right\} \right] \qquad (Equation\ -A)$$

Here, the above term as

P_{it} = Stock price of security i at time t

$E_t(D_{i(t+k)})$ = Expected dividend to be received at time t, at the end of period t+k

$E(R_{i(t+\tau)})$ = Expected return rate of security from the end of $t + \tau - 1$(previous period) to the end of $t + \tau$ (current period).

Suppose, if the future expected dividend is associated with current accounting earning, as follows;

$$E_t(D_{i(t+k)}) = \lambda_{i(t+k)}.X_{it} \qquad (Equation - B)$$

$D_{i(t+k)}$ is firm *i*'s dividend at the end of period *t+k*

X_{it} = firm accounting earnings for period *t*

Now, putting Equation - B into Equation -A, the stock price of security *i is as under;*

$$P_{it} = \left[\sum_{k=1}^{\infty} \lambda_{i(t+k)}) \prod_{\tau=1}^{k} \left\{ 1 / \left[1 + E(R_{i(t+\tau)}) \right] \right\} \right] X_{it} \qquad (Equation\text{-}C)$$

The unexpected return of the shareholders is defined as the sum of unexpected price change and unexpected dividend change as under;

$$UR_{it} = R_{it} - E_{(t-1)}(R_{it})$$ *(Equation-D*

$$= [P_{it} + D_{it}]/P_{i(t-1)} - [E_{t-1}(P_{it}) + E_{t-1}(D_{it})]/P_{i(t-1)}$$

$$= [P_{it} - E_{t-1}(P_{it}) + D_{it} - E_{t-1}(D_{it})]/P_{i(t-1)}$$

Now, putting the values of security price and expected security price, dividend and expected dividend values in above equation as follow;

$$UR_{it} = \left[\sum_{k=1}^{\infty} \lambda_{i(t+k)} \prod_{\tau=1}^{k} \left\{ 1/\left[1 + E(R_{i(t+\tau)}) \right] \right\} \right] X_{it}$$

$$- \left[\sum_{k=1}^{\infty} \lambda_{i(t+k)} \prod_{\tau=1}^{k} \left\{ 1/\left[1 + E(R_{i(t+\tau)}) \right] \right\} \right] E_{t-1}(X_{it}) + \lambda_{it} X_{it} - \lambda_{it} E_{t-1}(X_{it}) \Big\} /P_{i(t-1)}$$

$$= \left\{ \lambda_{it} + \left[\sum_{k=1}^{\infty} \lambda_{i(t+k)} \prod_{\tau=1}^{k} \left\{ 1/\left[1 + E(R_{i(t+\tau)}) \right] \right\} \right] \right\} [X_{it} - E_{t-1}(X_{it})]/P_{i(t-1)}$$

$$= \left\{ \lambda_{it} + \left[\sum_{k=1}^{\infty} \lambda_{i(t+k)} \prod_{\tau=1}^{k} \left\{ 1/\left[1 + E(R_{i(t+\tau)}) \right] \right\} \right] \right\} UX_{it}/P_{i(t-1)}$$

(Equation-E)

$$UR_{it} = ERC.UX_{it}$$

(Equation-F)

(Equation-F) above associate the unexpected accounting earnings to unexpected returns of the firm. The coefficient of unexpected accounting earnings scaled by price is the earnings response coefficient of the firm. (Total bracketed term in Equation-E). In this equation,

$[X_{it} - E_{t-1}(X_{it})]$ = Unexpected earnings of the firm for the period t

Appendix: Regression Equation Cumulative Abnormal Return as dependent variable

Redundant Fixed Effects Tests

Equation: EQ01_SIMPLE

Test period fixed effects

Effects Test	Statistic	d.f.	Prob.
Period F	34.002825	(5,947)	0.0000
Period Chi-square	158.510736	5	0.0000

Correlated Random Effects - Hausman Test

Equation: EQ01_SIMPLE

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	39.279672	7	0.0000

Dependent Variable: CAR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.022947	0.012112	1.894595	0.0585
UE	0.009429	0.002548	3.700938	0.0002
DRISK	-0.000132	0.000292	-0.453358	0.6504
BETA	0.004302	0.001102	3.904658	0.0001
SIZE	-0.001445	0.000806	-1.792050	0.0734
GROWTH	3.20E-08	3.91E-08	0.817980	0.4136
PROFIT	-3.14E-07	0.000147	-0.002129	0.9983
LEVERAGE	0.005729	0.005329	1.075238	0.2825

R-squared	0.174699	Mean dependent var	0.007321
Adjusted R-squared	0.164241	S.D. dependent var	0.041174
S.E. of regression	0.037641	Akaike info criterion	-3.707973
Sum squared resid	1.341784	Schwarz criterion	-3.642066
Log likelihood	1792.827	Hannan-Quinn criter.	-3.682874
F-statistic	16.70497	Durbin-Watson stat	2.084878
Prob(F-statistic)	0.000000		

Appendix: Regression Equation Earnings Response Coefficient as dependent variable

Redundant Fixed Effects Tests

Equation: ERC_01

Test period fixed effects

Effects Test	Statistic	d.f.	Prob.
Period F	0.825678	(5,948)	0.5314
Period Chi-square	4.171572	5	0.5250

Correlated Random Effects - Hausman Test

Equation: ERC_01

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.009383	6	0.5426

Dependent Variable: ERC
Method: Panel Least Squares
Date: 11/23/18   Time: 10:43
Sample: 2011 2016
Periods included: 6
Cross-sections included: 160
Total panel (balanced) observations: 960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.205347	2.153130	0.559811	0.5757
DRISK	0.001676	0.051876	0.032316	0.9742
BETA	-0.204943	0.195714	-1.047157	0.2953
GROWTH	-2.35E-06	6.94E-06	-0.337805	0.7356
SIZE	-0.007185	0.143032	-0.050230	0.9599
PROFIT	-0.013244	0.025452	-0.520331	0.6030
LEVERAGE	-1.194905	0.933119	-1.280549	0.2007

Effects Specification

Period fixed (dummy variables)

R-squared	0.007205	Mean dependent var	0.167414
Adjusted R-squared	-0.004315	S.D. dependent var	6.677643
S.E. of regression	6.692036	Akaike info criterion	6.652135
Sum squared resid	42454.61	Schwarz criterion	6.712971
Log likelihood	-3181.025	Hannan-Quinn criter.	6.675302
F-statistic	0.625407	Durbin-Watson stat	1.671542
Prob(F-statistic)	0.808150		

Appendix: Selection of Sample Size

Sr. No.	Non-Financial Sector Groups	Total Firms	Selected Sample	% of Total Firms
1	Textiles Sector	144	42	29.17
2	Sugar Sector	31	18	58.06
3	Food Sector	15	3	20.00
4	Chemicals, chemical products and Pharmaceuticals Sector	43	15	34.88
5	Manufacturing Sector	32	20	62.50
6	Mineral products Sector	9	8	88.89
7	Cement Sector	18	12	66.67
8	Motor vehicles, trailers and auto parts Sector	18	9	50.00
9	Fuel & Energy Sector	22	10	45.45
10	Information, Communication & transport Services Sector	11	5	45.45
11	Coke and refined petroleum products Sector	10	6	60.00
12	Paper, paperboard and products Sector	8	6	75.00
13	Electrical machinery and apparatus Sector	7	4	57.14
14	Other services activities Sector	10	2	20.00
	Total:	**378**	**160**	

Appendix: Selected Firms for the Period of 2011-2016 from Non-Financial Sector of PSX

Sr. No.	Sector and Firm Name	Sr. No.	Sector and Firm Name
	Textiles Sector	30	Indus Dyeing & Manufacturing Co. Ltd.
1	Ahmed Hassan Textile Mills Ltd.	31	International Knitwear Ltd.
2	Allawasaya Textile & Finishing Mills Ltd.	32	Ishaq Textile Mills Ltd.
3	Apollo Textile Mills Ltd.	33	J.A. Textile Mills Ltd.
4	Artistic Denim Mills Ltd.	34	Janana De Malucho Textile Mills Ltd.
5	Aruj Industries	35	Shahzad Textile Mills Ltd.
6	Ashfaq Textile Mills Ltd.	36	Shams Textile Mills Ltd.
7	Asim Textile Mills Ltd.	37	Sunrays Textile Mills Ltd.
8	Azgard Nine Ltd.	38	Suraj Cotton Mills Ltd.
9	Babri Cotton Mills Ltd.	39	Tata Textile Mills Ltd.
10	Bhanero Textile Mills Ltd.	40	The Crescent Textile Mills Ltd.
11	Blessed Textiles Ltd.	41	Zahidjee Textile Mills Ltd.
12	Brothers Textile Mills Ltd.	42	Zephyr Textiles Ltd.
13	Crescent Cotton Mills Ltd.		**Sugar Sector**
14	Crescent Fibers Ltd.	1	Adam Sugar Mills Ltd.
15	Dar Es Salaam Textile Mills Ltd.	2	Al-Abbas Sugar Mills Ltd.
16	Dawood Lawrencepur Ltd.	3	Al-Noor Sugar Mills Ltd.
17	Dewan Farooque Spinning Mills Ltd.	4	Ansari Sugar Mills Ltd.
18	Dewan Textile Mills Ltd.	5	Baba Farid Sugar Mills Ltd.
19	Elahi Cotton Mills Ltd.	6	Chashma Sugar Mills Ltd.
20	Ellcot Spinning Mills Ltd.	7	Habib - ADM Ltd.
21	Faisal Spinning Mills Ltd.	8	Habib Sugar Mills Ltd.
22	Fazal Cloth Mills Ltd.	9	Haseeb Waqas Sugar Mills Ltd.
23	Feroze1888 Mills Ltd.	10	Husein Sugar Mills Ltd.
24	Gadoon Textile Mills Ltd.	11	Imperial Sugar Ltd.
25	Gul Ahmed Textile Mills Ltd.	12	JDW Sugar Mills Ltd.
26	Hafiz Ltd.	13	Sanghar Sugar Mills Ltd.
27	Hala Enterprises Ltd.	14	Shahmurad Sugar Mills Ltd.
28	Hira Textile Mills Ltd.	15	Shahtaj Sugar Mills Ltd.
29	Idrees Textile Mills Ltd.	16	Shakarganj Limited

Sr. No.	Sector and Firm Name	Sr. No.	Sector and Firm Name
17	Sindh Abadgar'S Sugar Mills Ltd.	8	Emco Industries Ltd.
18	Tandlianwala Sugar Mills Ltd.	9	Huffaz Seamless Pipe Industries Ltd.
	Food Sector	10	International Industries Ltd.
1	Ismail Industries Ltd.	11	Pakistan Tobacco Co. Ltd.
2	Mitchell's Fruit Farms Ltd.	12	Philip Morris (Pakistan) Ltd.
3	Shezan International Ltd.	13	Service Industries Ltd.
	Chemicals, chemical products and Pharmaceuticals Sector	14	Shield Corporation Ltd.
1	Abbott Laboratories (Pakistan) Ltd.	15	Siddiqsons Tin Plate Ltd.
2	Agritech Ltd.	16	Thal Ltd.
3	Archroma Pakistan Ltd.	17	Treet Corporation Ltd.
4	Bawany Air Products Ltd.	18	Tri-Pack Films Ltd.
5	Berger Paints Pakistan Ltd.	19	United Brands Ltd.
6	Biafo Industries Ltd.	20	ZIL Ltd.
7	Buxly Paints Ltd.		**Mineral products Sector**
8	Colgate-Palmolive (Pakistan) Ltd.	1	Balochistan Glass Ltd.
9	Dewan Salman Fibre Ltd.	2	Frontier Ceramics Ltd.
10	Fauji Fertilizer Bin Qasim Ltd.	3	Ghani Glass Ltd.
11	Fauji Fertilizer Co. Ltd.	4	Ghani Value Glass Ltd.
12	Ferozsons Laboratories Ltd.	5	Karam Ceramics Ltd.
13	Gatron (Industries) Ltd.	6	Safe Mix Concrete Ltd.
14	The Searle Company Ltd.	7	Shabbir Tiles And Ceramics Ltd.
15	Wah Nobel Chemicals Ltd.	8	Tariq Glass Industries Ltd.
	Manufacturing Sector		**Cement Sector**
1	Al-Khair Gadoon Ltd.	1	Attock Cement Pakistan Ltd.
2	Bata Pakistan Ltd.	2	Bestway Cement Ltd.
3	Crescent Steel & Allied Products Ltd.	3	Cherat Cement Co. Ltd.
4	Dadex Eternit Ltd.	4	D.G. Khan Cement Co. Ltd.
5	Diamond Industries Ltd.	5	Dadabhoy Cement Industries Ltd.
6	Dost Steels Ltd.	6	Fauji Cement Co. Ltd.
7	Eco Pack Ltd.	7	Gharibwal Cement Ltd.

Sr. No.	Sector and Firm Name	Sr. No.	Sector and Firm Name
8	Kohat Cement Co. Ltd.	2	Pak Datacom Ltd.
9	Lucky Cement Ltd.	3	Pakistan Int. Container Terminal Ltd.
10	Pioneer Cement Ltd.	4	Pakistan National Shipping Corporation.
11	Power Cement	5	TRG Pakistan Ltd.
12	Thatta Cement Ltd.		**Coke and refined petroleum products Sector**
	Motor vehicles, trailers and auto parts Sector	1	Attock Petroleum Ltd.
1	Agriauto Industries Ltd.	2	Attock Refinery Ltd.
2	Al-Ghazi Tractors Ltd.	3	Byco Petroleum
3	Atlas Battery Ltd.	4	National Refinery Ltd.
4	Atlas Honda Ltd.	5	Pakistan Refinery Ltd.
5	Bolan Castings Ltd.	6	Shell Pakistan Ltd.
6	Exide Pakistan Ltd.		**Paper, paperboard and products Sector**
7	Ghandhara Industries Ltd.	1	Century Paper & Board Mills Ltd.
8	Millat Tractors Ltd.	2	Cherat Packaging Ltd.
9	Sazgar Engineering Works Ltd.	3	Merit Packaging Ltd.
	Fuel & Energy Sector	4	Packages Ltd.
1	Arshad Energy Limited	5	Pakistan Paper Products Ltd.
2	Burshane LPG (Pakistan) Ltd.	6	Security Papers Ltd.
3	K-Electric (formerly KESC)		**Electrical machinery and apparatus Sector**
4	Kot Addu Power Co. Ltd.	1	Ados Pakistan Ltd.
5	Mari Petroleum Co. Ltd. (Formerly Mari Gas Co. Ltd.)	2	Johnson & Philips (Pakistan) Ltd.
6	Nishat Chunian Power Ltd.	3	Pakistan Cables Ltd.
7	Oil & Gas Development Co. Ltd.	4	The Climax Engineering Co. Ltd.
8	Sui Northern Gas Pipelines Ltd.		**Other services activities Sector**
9	Sui Southern Gas Co. Ltd.	1	Javedan Corporation Ltd.
10	The Hub Power Co. Ltd.	2	Shifa International Hospitals Ltd.
	Information, Communication & transport Services Sector		
1	Netsol Technologies Ltd.		