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# Effect of Board Independence on Earning Response Coefficient (ERC): Evidence from Pakistan

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**ABSTRACT**

This study investigates whether board independence plays a significant role to enhance the Earning Response Coefficient (ERC) while controlling the established determinants of Earning Response Coefficient (Beta, Growth, Size and Earning Persistence). The study selected 250 non-financial firms of different sectors on the basis of purposive sampling technique which are enlisted in Pakistan stock exchange (PSX) for the time periods of eight years ranging from 2008 to 2015. Using reverse regression, it has been observed through statistical analysis that Beta is negatively related to ERC while others determinants (Growth, Size and Earning Persistence) are positively related to earning response coefficient (ERC). Moreover, the analysis result also suggested that corporate governance facet (Board independence) plays a significant role to enhance the earning response coefficient, because as per Pakistan Code of Corporate Governance (2012), the independent directors include those who are not connected to the companies, have no relationship with the companies and are free to exercise their judgment without any pressure. The important contribution for literature is that before making investment decision in stock market, investors should evaluate the corporate governance variables (Board independence) of the firms which can boost earning response coefficient (ERC). Secondly, previous studies (Shah,2017; and Collins & Kothari, 2004) and others researchers mostly worked on developed countries in the same area, but this research study is limited to emerging economy of Pakistan, that's why it has great contribution for literature.



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## 1. Introduction

The available literature mainly classifies directors of the companies' as outside directors, inside directors and grey directors. Those directors who are working currently as managers or executives are called inside directors, and

outside directors are those directors who represents such outside parties who has closely association with the companies and such nature of directors are also named as grey directors and those directors having no relation or affiliation with a company or business is called independent directors.

According to Pakistan corporate governance code (2012), the independent directors include those who are not connected to the companies, have no relationship with the companies and are free to exercise their judgment without any pressure.

The effective board can only be ensured when all the authority and responsibility are under the control of independent directors and not it the disposal of high authority i.e chief executive Officer (CEO) and some others top authorities who can distort the board independence (Farooq & Kimani; 2015; Fama, 1981; Fama & Jensan, 1983; M.C. Jensen & Mecklings, 1976; and Pearce & Zahra , 1989). Balatbat, Taylor and Walter (2004) based on a study conducted on Australian firms documented that outside ownership is not closely associated with the firm performance while independent directors may be considered an important variable to improve the firm performance.

Zakaria (2014) argued that market volatility and earning fluctuation mostly happen an emerging market. It has been observed by previous studies (Cheng & Nasir, 2011) that earnings response coefficient research is scarce an emerging market. The drive and influence of ERC has been explored a bite while comprehensive literature is still under process. So the main object of the study is to fill the gap in context of Pakistani market which has not been exposed yet.

Information plays a vital role for investment decision. The published information can attracts the investors to make right decision if the announced or published information has great values for investors. It has been noticed that market will react accordingly as per the announced information. These all needed information are available on company own sites. Moreover, Investors can get thorough and accurate information through annual reports which describe financial position and performance of the firm. One other option is financial statement through which Investors make investment decision for the sake of earning profit is earning response coefficient(Saleem & khurshid, 2014; Hartono, 2003).

It has been introduced by the capital market researchers that ERC has four significant determinants including beta, firm growth, earning persistence and firm size (Bernard and Rulands, 1987; Easton and Zmejeweski, 1989; Collins and Kothari, 1990; Biddle and Seaowe, 1991; Cho and Jungs, 1992; Dhaliwal and Reynolds, 1995; Kai, 2003; Kim, 2004; Cheng and Nasir, 2011, Zakaria et al; 2014). Stobars (1990) stated that ERC determinants are considered an important tool to predict the returns of securities.

It has been investigated through equally weighted index model and found that beta is considered as measure of systematic risk (Collins and Kothari, 1990). They used reverse regression analysis and found that the relationship between beta and ERC is negative and significant. The same work of Collin and Kothari were further extended by other studies (Huson, Scot and Wiere, 1999) and found that reverse relation exist between beta and ERC which means that as beta increase ERC will decrease and vice versa. Moreover, Collins and Kothari, (1990) also investigated and found that companies whose profit margin is high, will positively affect the growth opportunities which will ultimately increase the ERC. The earning persistence shows that how long time the earning remain or persist in the future as well. Kormendi and Lip (1987) argued that high returns are associated with earning persistence, which means that there a positive relationship between ERC and earning persistence. Brigham and Houstan (2012) argued that firm size can be categorized through different scales like total income, total assets or capital. Its common perception is that big companies share information on their sites which can decrease the uncertainty of the future cash flow of the company.

## 2. Literature Review

### 2.1 Board Independence / Independent directors

Literature has broadly classified directors into outside directors, inside and grey directors. Those directors who working as managers or executive is termed as inside directors, while outside directors are those who linked with such parties having business relation with the company and such directors may also called grey directors and independent directors are those who has no relation or affiliation with the company.

Comparatively, the outside independent directors are more responsible and have integrity than the inside directors

to better handle the misappropriation of funds and other corporate affairs. The inside directors are more influential and try their best to serve for own and shareholder interest (Fama, 1980; and Fama & Jensan, 1983) and implement strategies when organization feel some risks (Judge & Zaithaml, 1992). However, if the numbers of inside directors are in large, then possibility of firm performance will be low. Hill and Snell (1988) argued that presence of outside directors has positive impact on firm performance. The same results are also documented in other studies (Baysinger & Buttler, 1985; Choi, Park & You, 2009; Pearce & Zahra, 1993; Schellenger, wood & Tashekori, 1990; and Jeng & Pengs, 2008).

In addition, the abnormal stock return is associated with independent outside directors in the board and the chance of price reaction goes up in their presence, thus enhancing the owner wealth (Rosenstein and Wyat, 1991). Furthermore, Hermalin and Weisbach (1989) argued that independent outside directors' plays an important role to enhance the performance of the poor firms by protecting them in hard time when firm are going to failure. Moreover, Beasley (1999) stated that independent outside directors in the board is an important tool to curb the fraudulent activities in the firm which will ultimately increase the firm performance.

The corporate board is responsible to keep keen interest in the shareholder wealth and management activities which is considered the prime duty of the board. According to Fama (1983) and Fama & Jensan (1987), if outside independent directors performance is poor then the chances increase that corporation will incur the reputation cost which is bad sign for the company. Different researchers described the importance of independent outside directors in different time. For example its common perception that board can increase the ERC and shareholder wealth (Wang & Ali, 2013; Rosenstein & Wyat, 1991), while other perception is that outside independent directors enhance the shareholder wealth during tender offer which is considered an important function for the firms(Cotter, Shivdaseni, & Zener, 1999). Though, other opinion prevails that outside directors might not be performing well up to the mark because overall board culture discourages the divergence (Mace 1996; and Jensen 1993). Therefore, in general it's still ambiguous to find positive correlation between independent outside directors and firm performance (Yermack, 1997 and Bhagat and Black, 1999).

### 2.2 Earning Response Coefficient

The most important element of firm performance is earning profit which is considered the entity as a whole. Ball and Brown (1969) conducted research and found that investors make investment decision on the basis of profit information. It has been observed that company share price and return are closely associated with one another, which shows that stock return and share prices are directly proportion. ERC shows the investment decisions that depend on account profit and investors try their best to invest such securities which has better chances of return in future.

Collins and Kothari (1989) define ERC as a measure of magnitude of securities abnormal gains in response to the unexpected profit components. The declaration of low ERC indicates that the information regarding profit is not sufficient and it's hard for investors to make right economic decision. The response of investors is high when earning information and profit announcement is marked or publicized well in time.

According to (Shah & Hussain,2016; and Sandi,2013) ERC plays an important role to analyze or calculate stock value while using financial data of the companies,moreover, investors can easily access through these financial information that which company is more profitable and bearing less risk in future.

ERC is influenced by several factors which describe the characteristic or qualities of the companies, these factors are classified as beta, growth, size and earning persistence (Susilawati, 2008).

### 2.3 Beta

A study conducted by Collins and Kothari (1990) and found that beta is an important variable and considered as measure of a systematic risk, moreover, they also found that relation between beta and ERC is negative and significant while applying the reverse regression model of unexpected earnings on returns. Additionally, Huson, Scot and Wiere (2000) expended the work of Collins and Kothari (1990) and argued that there exist negative relation between beta and ERC,means when beta increases ERC will decreases and vice versa.

### 2.4 Growth

Collins and Khotari, (1999) stated that profit is directly linked with growth opportunities and ERC, because profit information is most attractive factors for investor which will ultimately increase the growth opportunities and ERC.

This shows that earning announcement and ERC are directly linked to one another. On the other hand, one perception is that profit and growth opportunities have no linked with one another and consequently no effect to enhance ERC (Palupi, 2006).

Collins and Kothari (1990) argued that growth opportunities is calculated by market to book ratio and this measure is alos used as a proxy for growth expectation. The mathematical expression of growth opportunities (GO) are as under.

$$\text{Growth Opportunity} = Pij/\ Bvij$$

Here Pij and Bvij represent book value and market value of equity. The above formula indicates that as the growth opportunities increases, the stock return will also increase and vice versa. It's also found that growth opportunities greatly influence the `ERC which is positive sign for investors.

### 2.5 Earning Persistence

The most important factor of ERC is earning persistence which indicates that how long the earning will remain consistent and persistence in the coming future. Previous researchers (Kormendi and Lipe, 1987; Collins and Kothari, 1990; Lip, 1991 investigated and concluded that stock return and earning persistence are associated with one another, if stock return remain constant for long time so earning persistence will also persist in future. This shows and ERC and earning persistence are positively related to one another.

### 2.6 Firm size

Brigham and Houston (2012 ) argued that size of a firm indicates that how much one firm is larger than the other and for this purpose size of the firm is classified on the basis of total income, total capital and total assets of the firms. Its general perception that big companies share information on company site and investors can easily interpret this shared information and decrease the uncertainty of future cash flow of the companies. This indicates that those companies who are big in size will have higher ERC (Naimah and Siddhartha, 2006). Conversely, some studies (Usman, 2015; & zahoor, 2013) have been conducted and their results show that firm size has no effect to increase or decrease the ERC. In this study, most of the firms were large in size, but the investors did not take into account the size of the firm while taking investment decision (Laila, 2013).

### 2.7 Board independence and Earning Response Coefficient (ERC)

As per Pakistan Code of Corporate Governance (2012), the independent directors include those who are not connected to the companies, have no relationship with the companies and are free to exercise their judgment without any pressure.

The effective board can only be ensured by the presence of independent outside directors who have control on the line of authority and are not at the disposal of the Chief Executive Officer (CEO) or some upper hand distorting the board independence (Fama, 1981; Fama & Jensan, 1983; M.C. Jensen & Meckling, 1977; and Zahra & Pearce, 1990). Balatbat, Taylor and Walter (2004) based on a study conducted on Australian firms documented that outside ownership is not closely associated with the firm performance while independent directors may be considered an important variable to improve the firm performance and ERC.

Comparatively, the outside independent directors are more responsible and have integrity than the inside directors to better handle the misappropriation of funds and other corporate affairs. The inside directors are more influential and try their best to serve for own and shareholder interest (Fama, 1980; and Fama & Jensan, 1983) and implement strategies when organization feel some risks (Judge & Zaithaml, 1992). However, if the numbers of inside directors are in large, then possibility of firm performance will be low. Hill and Snell (1988) noted the positive effect of outside directors on the firm performance and ERC. The same results are also documented in other studies (Baysinger & Buttler, 1988; Choi, Park & Yoo, 2009; & Pearce & Zahra, 1992)

The abnormal stock return increases due to increase of independent outside directors, moreover the price reaction greatly depend on their presence, which play a vital role to enhance the wealth of shareholders (Rosenstein and Wyat, 1999). Furthermore, Hermalin and Weisbaich (1989) argued that its necessary to increase the numbers of independent outside directors to increase the performance of poor firms, because the presence of outside directors protect the firm from hard time while firm is going to failure. Additionally, Imran & Malik (2015) and Beasley (1996) noted that we can reduce the frauds and increase ERC while increasing the numbers of independent outside

directors in the board because it's considered an important tool to control the fraudulent activities in the company

Kulkarni (2007) conducted a study who argued that independent outside director and firm growth are interlinked to each other which improves different areas or decrease the chances of default risk which will ultimately increase the ERC. So independent outside director is important facet of corporate governance which can positively affects the ERC and firm performance and decrease the exposure of firm for default risk.

Dunstan, Keeper, Truong and Van Zijl (2012) conducted a survey base research to find out that whether any relation exists between the board independence, firm's growth and ERC. For this purpose, they selected sample of 543 firms listed on the New Zealand Stock Exchange. They found that the independent directors, board size and audit committee independence play an important role to increase ERC and firm's growth.

**H1**: A significant relationship exists between board independence and earning response coefficient (ERC).
**H0:** In significant relationship exists between board independence and earning response coefficient (ERC).

In order to test the hypothesis, it's mandatory to control other variables which also determine ERC.The name of these control variables are Beta, Growth, size and earning Persistence.

## 3. Research Methodology

### 3.1 Study Period and Sample Selection

All non-financial firms are the study population. The study selected 250 firms of different sectors on the basis of purposive sampling technique for the period of 2008 to 2015, which can fulfill all the required data of the research. The data gathered from balance sheet analysis, annual reports and companies own sites.

### 3.2 Statistical Tool for Data Analysis

The collective data has been passed away through various statistical tool and technique like Descriptive Statistics, Correlational Analysis and Multiple Regression Analysis.

### 3.3 Model Specification

$$UR = ERC * (UX/P)$$

Variables n i.e x1.x2……xn which actually represent ERC

Then

$$UR = (x1, x2 \ldots xn) * (UX/P)$$

In the UR regressions, the mathematical expression of the Coefficient Xi*(UX/P) on {Xi*(UX/P)} represents the Xi effect on ERC. Moreover, a significant measurement error exist, it's clearly indicates that reverse regression will be used instead of direct regression. In this aspect, owing to the significant measurement error in UR, in this study for estimation purpose reverse regression is adopted instead of the direct regressions (Collins and Kothari, 1989). Other scholars also have applied it with the same rational making strong the argument of using this method in this study (Chao and Jung, 1992; Dhaliwal and Reynolds, 1994; Cready, Hurt and Saida, 2000; and Gunny, Jacob and Jorgensan (2009). Through regressions, the *{Xi}* effect is tested which is base on the below technique.

$$UX/P = [1/ (x1,x2, \ldots . , xn)]/UR$$

The above expression represents the regressions equation.

$$UX/P = a0 + a1\ UR + a2\ UR * X1 + a3UR * X2 + \ldots + an{+}1UR * Xn + \varepsilon$$

By applying reverse regression, the tests of coefficient is now reverse to the ERC and therefore it becomes Returns Response Coefficient (RRC). Its mean that the regressions results will react oppositely. For example, if a positive and significant relation found amongst coefficient of Xi*UR,so it will indicates that the coefficient Xi is negatively associated to ERC and vice versa.

As we discussed above that Coefficient {Xi} represent the effect of Xi on ERC, for this purpose this study will run

regression to investigate the effect of Beta, Firm Size, Earning Persistence and Growth with these variables as the {Xi}.The hypothesis of the study is, a significant relation exists between board independence and its effects on ERC. The researcher has used Board Independence (BI) in this regression equation to set of {Xi}. After adding the measure of Board Independence in a set of {Xi}, the below regression equation was intended.

$$UX/P = a0 + a1UR + a2UR * \text{BI} + a3UR * BETA + a4UR * GRTH + a5UR * EPRS + a6UR * SZ + \varepsilon$$

Thus when the value of $a\hat{}\ 2 < 0$ and also significant will show that Board Independence significantly effect on Earning Response Coefficient (ERC).

### 3.4 Measurement of Variables

#### 3.4.1 Control Variables

Beta, growth, size and earning persistence are determinants of ERC and act as control variables in this research study.

#### 3.4.2 Unexpected Earnings

Unexpected earning is calculated by taking difference between current years earning per share (EPS) minus previous year EPS. Moreover the unexpected earning is then deflated by previous years stocks prices.

#### 3.4.3 Unexpected Returns

The CAR (Cumulative Abnormal Return) is actually proxy of unexpected return (UR) which is obtained from annual report of the firms. Abnormal return is actually measured by differences between actual return and expected return, while sharp market model (1963) is used to obtain estimated expected return.

## 4. Data Analysis

### 4.1 Descriptive Statistics

The sample size of this study consists of 250 non-financial companies listed on Pakistan Stock Exchange (PSX). The secondary data of these companies have been collected from their websites and official document issued by the State Bank of Pakistan namely the "Financial Statement Analysis". Initially there were 2000 observations but outliers were found which were dropped through the statistical tests i.e. Winsorization and Cook's Distance test and finally 1697 observations were left which were used to estimate the results.

**Table 1: Descriptive Statistic of Earning Response Coefficient and Board Independence**

| Variable | Obs | Mean | Std. Dev | Min. | Max |
|---|---|---|---|---|---|
| **UXP** | 1696 | 0.16853 | 1.42202 | -4.4595 | 9.36208 |
| **Beta** | 1697 | 0.5916 | 0.47862 | -0.1684 | 1.90629 |
| **SZ** | 1697 | 15.1934 | 1.56921 | 11.3189 | 19.2532 |
| **GRTH** | 1697 | 0.90628 | 0.94755 | -1.8798 | 4.91669 |
| **EPRS** | 1697 | 2.69677 | 9.35632 | -34.972 | 34.6436 |
| **CAR** | 1697 | 0.06011 | 0.87625 | -1.1231 | 4.40488 |
| **BI** | 1697 | 0.60399 | 0.20245 | 0.125 | 0.91667 |

The descriptive statistics of Earnings Response Coefficient (ERC), Board independence and control variables are presented in Table 1. The table shows that the mean value of Uxp (Unexpected Earnings to price) is 0.16853 and the standard deviation is 1.42202. Similarly, beta has the mean value of 0.5961 which is almost half of the market beta value of 1.0. This implies that selected companies in the sample are not financially geared substantially and the same companies have on average low level of systematic risk in comparison to the entire market. The standard deviation of beta is 0.47862 which highlights low dispersion in the distribution of beta values. The mean value of firm size is 15.1934 and the standard deviation is 1.56921. Similarly, the mean value of firm growth is 0.90628 which is favorable as the market is willing to pay on average high price for the selected companies' stock due to the high growth potential. The average value of earnings persistence is 2.69677 and its standard deviation is 9.35632. The CAR (cumulated abnormal return) mean value is 0.06011 and its standard deviation is 0.87625.

The mean value of BI (independent non-executive directors) is 0.60399 which depicts the average percentage of independent non-executive directors in the board of selected companies in comparison to the lowest and highest values of 12% and 91% respectively.

### 4.2 Correlation analysis

To test all the variables of the study, correlation analysis was performed. Pearson correlation coefficient is shown amongst all the variables in the table. As pearson correlation represent the strength of linear relationship between two variables. The below table shows that board Independence(bi),beta,growth (grth),size(sz) ,cumulative abnormal return(car)and earning persistence(eprs) are significantly correlated with the ratio of unexpected earning to price(UX/P) .However the relation among all the variables is moderate and statistically significant. The table of correlation indicates that there is no serious issue of multicollinearity amongst all the independent variables because none of the pearson coefficient exceeds 0.7(pallat, 1996).

**Table 2: Correlation Analysis**

| | Uxp | Bi | Beta | Grth | Sz | Car | Eprs |
|---|---|---|---|---|---|---|---|
| Uxp | 1 | | | | | | |
| BI | -0.040 | 1 | | | | | |
| Beta | 0.021 | 0.166** | 1 | | | | |
| Grth | -0.04 | 0.203** | 0.028 | 1 | | | |
| Sz | -0.056* | 0.366** | 0.199** | 0.199** | 1 | | |
| Car | 0.045 | -0.026 | 0.116** | -0.0173 | 0.0447 | 1 | |
| Eprs | -0.33** | -0.0244 | -0.160** | -0.091** | -0.311** | -0.130** | 1 |

*. Correlation is significant at the 0.05 level (2-tailed), **. Correlation is significant at the 0.01 level (2-tailed

### 4.3 Ordinary Least Square (OLS) Assumptions

Before performing the regression analysis, OLS assumptions have been tested to determine. The first assumption tested was the normally that whether data is following the normal distribution or not. In this regard, Wensorization and Cook's Distance test were used after which outliers were dropped and then the normality assumption was tested through the Shapiro-Wilk test. Another problem was multicollinearity which was also needed to be addressed. To check the multicollinearity, Variance Inflation Factor (VIF) test has been used which showed that there is no serious issue of multicollinearity amongst the explanatory variables as all the test values are less than critical the value of 10 (Gujrati, 2005). The VIF values are provided in the respective tables given below. In panel data analysis one of the main problems is heteroskedasticity which was tested through the Breusch-Pagan / Cook Weisberg test for heteroskedasticity. The test results show that the pertinent p-values are 0.05 which showed existence of heteroskedasticity in the data. To tackle this issue the robust standard error was used. To check the autocorrelation, Durbin Watson test was used. As a rule of thumb, the values between 1.5 and 2.5 are relatively acceptable (Koksal & Kettaneh, 2011). There is no serious autocorrelation as test values are in the range (1.5-2.5) given in table of the econometric models. Moreover, Hausman Test was used to select random or fixed effects model, the test results indicated that fixed effect model (FEM) is the appropriate model which was used to run the econometric models / equations.

Now the board independence and its effect on ERC Determinants, the following two econometric models are used to show the effect of these two variables. The estimation of two regressions equation are as follows.

$$UXit/Pit = \alpha 0 + a1CARit + a2CAR*BETAit + a3CAR*GRTHit + a4CAR*EPRSit + a5CAR*SZ\ it + Year\ fixed\ effect + \varepsilon it \quad (1)$$

$$UXit/Pit = \alpha 0 + a1CARit + a2CAR* \mathbf{BIit} + f\,(control\ variables) + \varepsilon it \quad (2)$$

### 4.4 ERC and its determinants results

$$UXit/Pit = \alpha 0 + a1CARit + a2CAR*BETAit + a3CAR*GRTHit + a4CAR*EPRSit + a5CAR*SZ\ it + Year\ fixed\ effect + \varepsilon it \quad (1)$$

**Table 3: Dependent Variable UX/P**

| **Pool OLS Regression DV=UX/P** | | | **Robust Pool** | | **RE** | | **FE** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **beta** | **P-value** | **beta** | **P-value** | **beta** | **P-value** | **beta** | **P-value** | **VIF** |
| **Car** | 2.1594 | 0.0000 | 2.1594 | 0.0010 | 2.1594 | 0.0000 | 1.9078 | 0.0000 | 1.20 |
| **Carbeta** | 0.3644 | 0.0000 | 0.3644 | 0.0640 | 0.3644 | 0.0000 | 0.3155 | 0.0020 | 3.14 |
| **Cargrth** | - 0.095 | 0.0400 | -0.0959 | 0.2070 | -0.0959 | 0.0600 | -0.0974 | 0.0500 | 2.57 |
| **Careprs** | - 0.019 | 0.0000 | -0.0192 | 0.0200 | -0.0192 | 0.0000 | -0.0201 | 0.0010 | 1.15 |
| **Carsz** | -0.1410 | 0.0000 | -0.1410 | 0.0010 | -0.1410 | 0.0000 | -0.1221 | 0.0000 | 1.34 |
| **_cons** | 0.1466 | 0.0100 | 0.1466 | 0.0000 | 0.1466 | 0.0000 | 0.1469 | 0.0000 | |
| **R2** | **0.0342** | | **0.0342** | | **0.0342** | | **0.0337** | | |
| **Adjusted R2** | 0.0308 | | | | | | | | |
| **F-value** | 9.9700 | | 3.2500 | | 59.8500 | | 7.8100 | | |
| **P-value** | 0.0000 | | 0.0035 | | 0.0000 | | 0.0000 | | |
| **Lamgre** | | | | | 0.0000 | 1.000 | | | |
| **Hausman test** | | | | | 5.74 (0.04525) | | | | |
| **Breusch –pagan** | | | | | 2.39 (0.53) | | | | |
| **Swilk** | | | | | 1.66 (0.78) | | | | |
| **Durbin Watson** | | | | | 2.175 | | | | |

### 4.5 Effect of Board Independence on ERC

$$UXit/Pit = \alpha 0 + a1CARit + a2CAR^{*} BIit + f(\text{control variables}) + \varepsilon it \quad (2)$$

The above table shows the CAR and Beta relationship while using the Fixed Effect Model. As can be seen from the respective test values, all assumptions of multiple regression are being fulfilled. The results presents that interaction of CAR and coefficient of Beta is positively and significantly interlinked to each other which means that the relationship between beta and ERC is negative and significant. These results are similar to the previous studies (e.g., Zakaria, 2013; Dhaliwal et al., 1992; Dhaliwal and Reynold, 1997; Billings, 1999; and Shanguan, 2007). The previous researchers have investigated and suggested that Beta has negative relation with ERC. Similarly, the relation between the interaction of CAR and firm growth is negative and significant which means that according to reverse regression, the firm growth is insignificantly and positively related with ERC. These results are similar to other pertinent studies (Zakaria, 2013; Collin and Kothari, 1990; Martikainan, 1997; Billings, 2000; Park and Pincas, 2000; Kim, 2005; Ghosh et al., 2005; Shanguan, 2007). The results also depict that CAR and earnings persistence are significantly and negatively related with each other which means that earnings persistence is significantly and positively related with ERC. These results are similar to other related studies (Zakaria, 2013; Kormendi and Lipe, 1987; Collins and Kothari, 1989; and Dhaliwal and Reynolds, 1994). As regards CAR and firm size, their relation is also negative and significant which means that the firm size has positive and significant relation with ERC. These results are consistent with Billings (1999) and Vafeas (2000). However, Martikainen (1997) found that the firm size and ERC has no relation which means that for large and small firms, the ERC will remain the same. Similarly, Walker (1995) also noted that the firm size is not a significant determinant of ERC. Nevertheless, Shangguan (2007) found the consistent results that the firm size is positive and extremely significant determinants of ERC which shows that for large size firms, the ERC will be high.

The below regression result shows the effect of Board independence on ERC. The test values depict that there is no violation of assumptions of multiple regression After statistical results the above table presents that the coefficient of interaction term of CAR and Board Independence is found negative and significant which mean (referring to reverse regression) that the interaction of coefficient of CAR with board independence has significant and positive relationship with ERC. On the basis of this result it accepts the alternative hypothesis that board independence and ERC are significantly interlinked to each other. These results are consistent with other studies (Zakarai, 2013 Bhojraj and Sengopta, 2005). The results also highlight that large number of independent outside director in a board are favorable for the firms, because different directors have the potenti al of multi skill, ability to monitors and control all sort of company activities specifically related to the debt obligations in an efficient way in order to mitigate the impact of firms' default risk on ERC. Therefore, it is concluded that the results support the hypothesis H1: Board independence has positive and significant relationship with ERC. In other words, companies with large number of independent directors in the boards may be less exposed to the default risk through better corporate

governance to positively affect the ERC.

**Table 4: Dependent Variable UX/P**

| **Pool OLS Regression DV=UX/P** | | | **Robust Pool** | | **RE** | | **FE** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **beta** | **P-value** | **beta** | **P-value** | **beta** | **P-value** | **beta** | **P-value** | **VIF** |
| **Car** | 0.067 | 0.117 | 0.067 | 0.345 | 0.067 | 0.117 | 0.076 | 0.099 | 1.37 |
| **Carbi** | -0.142 | 0.043 | -0.142 | 0.066 | -0.142 | 0.053 | -0.008 | 0.047 | 1.06 |
| **Beta** | 0.207 | 0.004 | 0.207 | 0.030 | 0.207 | 0.004 | 0.148 | 0.031 | 1.12 |
| **Grth** | -0.120 | 0.001 | -0.120 | 0.001 | -0.120 | 0.001 | -0.023 | 0.058 | 1.08 |
| **Eprs** | -0.054 | 0.000 | -0.054 | 0.000 | -0.054 | 0.000 | -0.064 | 0.000 | 1.05 |
| **Sz** | -0.083 | 0.000 | -0.083 | 0.000 | -0.083 | 0.000 | -0.577 | 0.000 | 1.16 |
| **R2** | **0.133** | | **0.133** | | **0.133** | | **0.058** | | |
| **Adjusted R2** | 0.130 | | | | | | | | |
| **F-value** | 37.130 | | 24.170 | | 259.910 | | 42.810 | | |
| **P-value** | 0.000 | | 0.000 | | 0.000 | | 0.000 | | |
| **Lamgre** | | | | | 0.000 | 1.000 | | | |
| **Hausman test** | | | | | | 62.81 (0.000) | | | |
| **Breusch-pagan** | | | | | | 1.23 (0.29) | | | |
| **Swilk** | | | | | | 1.21 (0.71) | | | |
| **Durbin Watson** | | | | | | 2.112 | | | |

## 5. Conclusion

This study explored the effect of Board independence on Earnings Response Coefficient (ERC) while controlling the established determinants of ERC (Beta, Firm Growth, Firm Size and Earnings Persistence). The results indicate that there exists negative and significant relationship between Beta and ERC supporting the view that Beta is a partial measure of risk specific to ERC. These results are in line with other previous studies (Zakaria, 2013; Dhaliwal et al., 1991; Dhaliwal and Reynold, 1995; Billings, 1999; Shanguan, 2007) which also documented that Beta is a measure of systematic risk and has negative relation with ERC. The relationship of firm growth with ERC is significant and positive which is also similar to results of other studies (Zakaaria, 2013; Collin and Kothari, 1990; Martikainan, 1997; &Billings, 1999). According to Palupi (2006) who argued that high growth companies has greater possibilities to earn high profit in the coming future. Likewise, the results pertaining to earnings persistence with ERC are also significant and positive. Other studies also have documented the similar results like Zakaria, 2013; Kormendi and Lipe, 1987, Collins and Kothari, 1989; and Dhaliwal and Reynolds, 1994. These studies highlighted that earnings persistence is concerned with firms' profits, as long as earnings persist, firms will get more and more profit and termination of earnings persistence will directly affect the earnings and ERC. Thus, overall there may be a positive link between earnings persistence and ERC. As regards the firm size it was found that it also has positive and significant relation with ERC which implies for large firms the magnitude of ERC will be high. These results are consistent with Billings (1999) and Vafeas (2000) who argued that big companies being having a sound reporting system are in a better position to publicized the company information on their sites which is good sign for investors to interpret these information to decrease the uncertainty of future cash flow. This mean that those firms whose size is high will have higher ERC.

Similarly, results also support the hypothesis that Board independence positively and significantly effect the ERC. These results are consistent with Zakarai, 2014 and Bhojraj and Sengupta, 2003 who also have supported the view that the presence of independent directors in the board provides multi-skills and improves the broad ability to better monitor and control the use of debt without undue pressure so that exposure to the default risk may be reduced and in turn affect the ERC. Moreover this research study is conducted in emerging economy of Pakistan where corporate governance and capital market is not well developed and fluctuation in stock prices occurs due to different circumstances i.e. political instability, war and terror etc but still the statistical results are same as found in developed countries, that's why this study has great literature contribution an emerging economies. The finding of this study highlights some ideas to others researchers in capital market in the area of corporate governance and earning response coefficient (ERC).

### 5.1 Recommendations

Recommendations are provided to suggest desired course of actions in light of findings of the study whereas future directions are provided to support the study findings. The relevant recommendations are as under:-

- Steps should be taken at board level such as better asset allocation strategy to manage the systematic risk
- The results pertaining to the firm size have the policy implications which may call measures by the regulators such as the Securities and Exchange Commission of Pakistan (SECP) to consider firm size as an important factor to be a part of listing requirements so that only large size firms may be eligible to be listed.
- Similarly, companies should also consider the role of corporate governance facets to reduce exposure to the default risk by monitoring and productively using the corporate debt to improve the ERC.
- The policy implications by the regulators also call for improving the board independence by increasing independent directors in in the boards. The regulators should also take into account the role of board independence.

### 5.2 Future Directions

- The current research study provides basis for the researchers to test all the tested and remaining constructs related to the corporate governance facets and ERC.
- It is suggested that future researches may be conducted with large sample sizes covering and longer time frame.
- Similar studies may be conducted in settings of other emerging economies to validate results of this study.
- It is also suggested that further studies may be undertaken with more determinants of ERC along with considering additional variables of corporate governance. This will further refine results of this study and contribute towards the pertinent literature.
- Comparison of emerging and developing economies may also be done considering the inter-relationship of variables used in this study to enhance overall undertaking of this relationship.

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