PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS

Effect of Credit Rating on Firm Performance and Stock Return: Evidence form KSE Listed Firms

Rubina Shaheen
Attiya Yasmin Javid

May 2014

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Rubina Shaheen
Pakistan Institute of Development Economics, Islamabad

and

Attiya Yasmin Javid
Pakistan Institute of Development Economics, Islamabad

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ISLAMABAD**

2014

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ABSTRACT

This study investigates the determinants of credit ratings of firms and the impact of credit rating on firms' performance and stock return for listed firms in Pakistan. For empirical analysis of this study, panel data of 63 financial and nonfinancial firms rated by Pakistan Credit Rating Agency (PACRA) and Karachi Stock Exchange covering period from 2007-2011 is used on the basis of availability of data. The results are obtained by applying two estimation techniques. First, to estimate the determinants of credit rating Ordered Probit approach is used. Second, the generalised method of moments (GMM) technique is applied on panel data to estimate the relationship between credit rating and firm performance and also for credit ratings and stock returns. The results illustrate that firm specific factors (leverage, firm size, profitability, and growth opportunities dividend per share) and corporate governance attributes (board size, block holders, shareholder's rights and CEO duality) are important factors in predicting firms' credit rating in Pakistan. The analysis further suggests that firms with higher credit ratings have higher corporate performance and firms with higher credit ratings tend to have higher stock returns. The analysis of this study might facilitate debt holders, investors, shareholders and other stake holders to understand the significance of credit ratings and its influence on performance and stock returns of firms.

JEL Classification: G10, G11, G30, G32

Keywords: Credit Ratings, Financial Attributes, Corporate Governance Attributes, Business Conditions, Stock Returns, Ordered Probit Model, PACRA

1. INTRODUCTION

A firm's credit rating reflects a rating agency's opinion of an entity's overall creditworthiness and its capacity to satisfy its financial obligations [Standard and Poor's (2002)]. Credit agencies are concerned with governance because weak governance can impair a firm's financial position and leave debt stakeholders (hereafter referred to as bondholders) vulnerable to losses [Fitch Ratings (2004)]. Credit ratings express forward looking opinions regarding the creditworthiness of issuers and issues. The term creditworthiness refers to the likelihood of an issuer to make timely payments of interest and principal, in accordance with its contractual terms, but it is not an absolute measure of default probability [S&P Global Credit Portal (2009)]. A credit rating embodies multiple factors that compose the overall assessment of creditworthiness. Besides the likelihood of default, it also encompasses payment priority, recovery and credit stability. The Credit Rating Agencies (CRAs) do not have a "formula" for combining various factors, and the relative importance of the factors may vary between types of securities, firms and industries, between regions, currencies and different situations.

Credit ratings are issued by credit rating agencies to measure companies' ability to meet its financial obligations. The credit rating agencies base their ratings on both publicly held information and private information, as well as their ratings on their subjective view of a company. Since companies cannot exactly overview a counterpart's financial situation, many companies rely on rating agencies to get an accurate depiction of a debtor's ability to repay the obligation. This means that a favourable credit rating is very important to get beneficial terms and conditions when firms issue debt on financial markets. Hence, CRAs must use a great deal of subjective judgment during the credit rating process. Furthermore, the rating symbols are intended to reflect the same general level of creditworthiness for issuers and issues regardless of different sectors, industries, and at different times [S&P Global Credit Portal (2009)].

Credit ratings are used by large number of issuers, investors, intermediaries, financial institutions and nonfinancial institutions used to assess credit risk for their own purpose and use. Investors exploit the credit ratings to assess credit risk and evaluate different issuers and debt issues in making investment decisions. To assist the flow of capital from investors to issuers investment bankers use credit ratings. Financial institutions use credit rating in order to do credit sensitive transactions and to assess the credit risk of counter party. Issuers, such as corporations, governments, and municipalities, use credit ratings to obtain independent analysis of their creditworthiness and the quality

of debt issues [Hyleen Ostlund (2009)]. Furthermore, Credit ratings provide timely an independent assessment of a company's ability to service its debt. Credit ratings can effect on firms' cost of debt and their capital structure; ultimately determining probability of survival. Furthermore, rated firms' business and financial strategies can potentially affect the rating and their future cost of capital [Graham and Harvey (2001)].

The nature of the rating methodology has attracted many researchers to gain an insight into the exact inputs of the rating agencies' models. The first empirical study research on credit rating is attempted by Horrigan (1966) for US corporate bonds rated by US rating. It is acclaimed that credit ratings provide with a useful, comparable, and summarised measure for financial position and health and credit worthiness of rated firms of large and diverse group of decision makers.

Many studies have focused on credit ratings in different countries, for instance United States [Blume, *et al.* (1998)], United kingdom [Adams and Hardwick (2003)], Australia [Gray, *et al.* (2006)], Jordan [Al-Khawaldeh (2012)] but in case of Pakistan, the credit ratings have never been given importance. Raqeeb, *et al.* (2012) investigated the credit rating impact on manager's decision of choosing debt level in capital structure of the company. As credit rating is getting importance worldwide in decision making for capital structure of firms; there is need of such research in Pakistan to examine the relationship between credit ratings, stock return, firm performance and corporate governance variables of financial and nonfinancial sector.

There are two main and internationally famous rating agencies in world such as Moody's and Standard and Poor's (S&P). Pakistan Credit Risk Agency Limited (PACRA) is a reputable and important credit rating agency operating in Pakistan and this is the one chosen for present study.

This study tries to focus on three objectives. First, is to examine the determinants of credit ratings in Pakistan, Second, to examine the impact of credit ratings on firm financial performance after controlling firm specific variables, corporate governance attributes and macroeconomic conditions, and third, to examine the impact of credit ratings on stock returns after controlling firm specific variables, corporate governance attributes and macroeconomic conditions.

The significance of credit ratings and its effect on firm performance, stock market performance and on corporate governance has never been deeply studied in Pakistan. The significance of credit ratings in financial and investment decisions can be demonstrated in numerous several previous studies. This study therefore contributes to the literature by examining the significance of credit ratings in determining the financial performance, stock market performance and also testing the impact of corporate governance variables on credit ratings for both financial and nonfinancial firms in Pakistan. In case of Pakistan credit rating is still at its initial stage**,** however, regulatory authorities such as State

Bank of Pakistan (SBP) and Security Exchange Commission of Pakistan (SECP) made it obligatory for banks to obtain credit ratings on regular basis. The purpose is to provide 000000000yardstick to the market participants and stakeholders for informed decision making, promote healthy competition and induce financial institutions to improve their state of financial affairs.

The remainder of the study is organised as follows. The second section briefly reviews the relevant literature in this area. The theoretical framework and formulation of hypotheses are presented in Section 3. The section four contains the methodological framework and data. The empirical results are discussed in Section 5 and last section offers conclusions and policy implications of the study.

2. LITERATURE REVIEW

Credit Ratings are tools provided to evaluate the chance investors have of receiving interest and principal repayments on a debt as scheduled in the involved contract issued by the borrower. Credit Ratings have an effect on capital markets, influencing them directly and/or indirectly through rating based regulation. The direct effect of ratings on yields implies that ratings contain information that is publicly unavailable, and that markets are therefore not efficient. In this sense, empirical studies on market dynamics test the theoretical concept of market efficiency. Further the effect of credit rating on firm performance and stock returns is also investigated.

2.1. Determinants of Credit Ratings

The previous empirical literature has used firm specific factors, corporate governance variables and macroeconomic variables as determinants of credit rating. The determinants of credit rating have been analysed by researcher using financial ratios. For example Horrigan (1966), Ederington (1986), Adams and Hardwick (2003) and Al-khawaldeh (2012), while Raqeeb, *et al.* (2012) examined the effect of credit ratings on capital structure of non-financial sector of Pakistan.

2.1.1. *Impact of Firm Characteristics on Credit Rating*

Financial ratios are the fundamental determinants of credit quality of any firm. The strong correlation between credit ratings and financial statements in prior studies underlines that credit ratings and financial statements are alternative measures of corporate default.

Altman (1968) used five financial ratios such as working capital to total assets, retained earnings to total assets, earnings before interest and taxes total assets, market value of equity to book value of total assets, and sales to total asset to predict the bankruptcy. The study concluded that these variables have

statistically significant effects in a default prediction exercise and the model is found to be highly accurate for predicting bankruptcy. Moreover it is suggested that the model is an accurate forecaster of failure up to two years prior to bankruptcy. Kaplan and Urwitz (1979) have conducted research on statistical model of bond ratings, their study revealed that the model may be predict the actual risk of a bond better than the rating agency. They used interest coverage ratio, the long term debt to total assets ratio, the long term debt to net worth ratio, the net income to total assets ratio, the coefficient of variation of total assets, the coefficient of variation of net income, and total assets in their study. Horrigan (1966) has conducted study on determinants and characteristics of the bonds issuing firms. He used two-step analytical approach in order to predict the bond rating based on financial ratios and characteristics of ratings. For bond ratings he has used ordinary least-squares (OLS) regression with different combinations of variables, from accountings data (1961-1964) to predict the ratings of newly issued bonds as well as any changes in bond rating. He has explained 65 percent of variation in the bond rating and also found that total assets have the most significant impact on bond ratings. Beaver (1966) used financial ratios such as cash flow ratios, profitability ratios, liquidity ratios and turnover ratios, from financial statements available for first year before failure of firm to predict firm failure. Assets size and data for non-failed firm and failed firm from same industry is taken in order to keep the data balanced. Pinches and Mingo (1973) employed financial ratios to predict the industrial bond ratings. They have used six financial ratios such as earnings ratios, debt ratios, total assets, working capital ratios, net income sales worth, debt and debt coverage ratios and means for percentage changes in sales. The model is unable to correctly predict 69.70 per cent of the actual ratings in the original sample, and predicted approximately 60 per cent of the ratings for a holdout sample and another sample of newly rated bonds. The variables concerning to size, debt and debt coverage stability, earning stability, return on investment and financial leverage, are simulated the results of Moody's ratings. Ederington (1985) have used interest coverage, the long term debt to capital ratio, and total assets in his research for comparison of bond rating models and statistical methods. The financial ratios employed in this study have statistically significant impact on credit ratings.

Kumar and Arora (1995) have taken performance data from financial statements of banks to develop risk rating schemes. The performance variables included in their study are liquidity, asset quality, earnings and management capital adequacy. These variables are categorised into various sets. To predict failed and non-failed firms linear logit model and quadratic model are employed. The conclusion of their study reflected that while testing classification performance for the sample with linear logit model 96 percent of the failed banks are correctly classified and 70 percent of the non-failed were correctly

classified, whereas, in testing the classification performance for the learning sample with quadratic model 95 percent of failed banks and 75 percent of the non-failed firms were correctly classified.

Pottier (1998) have used various financial ratios to study the effectiveness of Best's rating and changes in rating while predicting the life insolvency of insurer. The ratios included in the study are profitability, leverage and liquidity ratios. He uses three different models with given independent variables, the first is based financial ratios, second is developed on basis of ratings and rating changes and last one is based on merging financial ratios. Logistic regression method is employed in the research. He found that predictive ability is improved with combination of ratings and rating changes as compare to financial ratios for the cost ratios. Moreover, the findings suggested that rating changes should be incorporated in insolvency prediction models as these are important predictors of insurer collapse even when pooled with financial ratios. Blume, *et al.* (1998) conducted study on the declining quality of U.S. corporate governance debt in a panel regression from 1978 to 1995. They employ financial ratios for pre-tax interest coverage, operating income to sales, long term debt to assets, total debt to assets, and total assets. Their results suggested that the long term ratio is significantly related to credit ratings whereas the total debt ratio is insignificant, this due to high correlation between these two variables the total debt ratio should be negatively related to credit ratings or due to multicollinearity as pointed out by Amato and Furne (2004). Kamstra, *et al.* (2001) employed net income plus interest expenses divided by interest expenses to represent interest coverage, a debt ratio measured by total debt divided by total assets, profitability captured by the net income total assets ratio, and firm size measured as book value of firm assets. They find that the debt ratio is negatively related to credit ratings whereas return on asset is positively related to credit ratings. The firm's size significantly affects ratings and leads to higher credit ratings. On the contrary interest coverage has no significant impact on ratings thus they suggested that interest coverage did not determine the credit ratings.

Adams and Hardwick (2003) examined the determinants of credit ratings and investigated the likelihoods of being external rated of financial sector in case of United Kingdom firms. The financial ratios used in the study are profitability, growth, leverage, firm size, organisational form, and business activity. To find out the rating likelihood a multinomial logit model is used. The findings conclude that the probability of being rated is positively related to profitability of insurer and negatively related to leverage of firm, although some differences in the determinants of the likelihood of being rated by UK rating agencies. The results also proposed that higher ratings can achieved through higher levels of profitability and liquidity. Furthermore, there is inverse relationship between ratings and leverage because lower financial leverage leads to higher credit ratings. Bissoondoyal-Bheenick (2005) examined the quantitative determinants of credit ratings using he financial ratios for the

companies. The main findings suggest that profitability, size and leverage ratios have a significant impact in the predicting credit ratings. Further the results also indicate the earlier evidence pertaining to the effect of rating changes whereby, only credit rating downgrades influence the market cannot be applied to all the credit rating agencies. Gray, Mirkovic and Ragunathan. (2006) worked on determinants of Australian credit ratings by testing the association between financial ratios and industry variables. They have taken profitability, leverage, cash flow ratios and interest coverage ratios. They adopted Ordered Probit Model approach in their study. The results suggest that leverage ratios and interest coverage have significant effect on credit ratings. However, it is also observed that industry variables and profitability ratios have very important impact on credit ratings in evaluating determinants of Australian credit ratings.

Tanthanongsakkunm and Treepongkaruna (2008) compared the market based model and accounting based model and examined the likelihood of both models in explaining the credit ratings. They take market to book ratios and firm size proxy for market based model and debt leverage ratios and interest coverage ratio for accounting based model. They employed ordered Probit model methodology. The findings reflected the likely relationships between the credit ratings and all independent variables while the market based model's variables were found more significant than that of accounting based model variables. However, Gray *et al.* (2006) found the leverage ratios and interest coverage ratios more significant while considering accounting based model than market based model.

Al-Khawaldeh (2012) has conducted study on determinants of credit ratings. Firm specific variables used in the study are profitability, leverage, capital intensity, growth opportunity and firm size whereas audit quality is used as corporate governance proxy. The results in conclusion suggested that firm characteristics variables have significant impact on firm's credit ratings. Profitability has positive impact on credit rating for all models, while leverage and loss propensity are negatively associated with credit ratings for all models. Capital intensity is insignificant thus it does not determine the credit ratings of firm. The growth potential which is measured by Tobin's Q and firm size are highly positively associated with credit ratings.

Rashid and Abbas (2011) conducted study to predict the bankruptcy of nonfinancial sector in Pakistan. They used twenty four financial ratios to measure financial characteristics of companies, for instance, profitability, liquidity, leverage, and turnover ratios were examined for a five-year period before bankruptcy. They suggested that financial ratios are important in predicting bankruptcy of companies during the period of 1996 and 2006. The discriminant analysis produced thrifty models of sales to total assets, EBIT to current liabilities, and cash flow ratio. Their results reflect that the "firms having Z value below zero falls into the "bankrupt" whereas the firms with Z value

above zero fall into the "non-bankrupt" category". Moreover, the model achieved 76.9 percent prediction accuracy when it is applied to forecast bankruptcies.

2.1.2. *Corporate Governance*

Many previous studies used corporate governance proxies to investigate the effect of these variables on credit ratings [Bhojraj and Sengupta (2003); Ashbaugh-Skaife, *et al.* (2006). The governance variables such as shareholder rights, CEO duality, board size, block holders and audit quality are used in current study. The term corporate governance came into popular use in the 1980's to broadly describe the general principles by which the business and the management of companies were directed and controlled. There is no universally accepted definition of the corporate governance it provides a general framework of discussion.

Corporate governance is referred as complementary set of legal, economic, and social institutions that protect the interests of a corporation's owner in broader sense. The concept of corporate governance presumes fundamental tension between shareholders and corporate managers [Berle and Means (1932) and Jensen and Meckling (1976)]. While the objective of a corporation's shareholders is a return on their investment, managers are likely to have other goals, such as the power and prestige of running a large and powerful organisation, or entertainment and other perquisites of their position. In this situation, managers' superior access to inside information and the relatively powerless position of the numerous and dispersed shareholders.

In today's strong regulatory setting corporate governance practices provide sources to justify risks of firm and maximise firm performance at the same time. Gompers, *et al.* (2003) argued in their study that if performance of firm is determined by corporate and their association is fully incorporated by the stock market movements, then stock return should quickly correct to any significant change in the governance of firm. Further, Samontaray (2010) has suggested that corporate governance sets framework for creating long-term faith between company and stakeholders. Moreover, Shaheen and Nishat (2005) argued that firms with poor governance have lower valuation, while firms with good better governance have higher valuations.

Various studies measure the influence of corporate governance on firm performance. A review of the state of corporate governance research is provided by Bhagat and Bolton (2008) and Lucian and Bebchuck(2010).Corporate governance is measured by the Gompers et al. (2003) index is positively correlated with better operating performance. Moreover, they argued that contrary to previous studies, governance measures are not correlated with future stock market performance, if endogeneity is adequately addressed. Bhoraj and Sengupta (2003) link corporate governance factors, credit ratings, and bond

yields, in doing so they link corporate governance mechanisms to higher credit ratings. The results showed that firms with greater institutional ownership and stronger outside control of the board enjoy lower bond yields and higher ratings on their new bond issues. They further suggest that corporate governance mechanisms can reduce information asymmetry between firms and lenders. They also point out that a likelihood of firm default risk depends on the availability of plausible information to assess the default risk and agency costs. Brown et al. (2011) work focused on corporate governance. The choice of investing as a bondholder or as stockholder is the main issues Shleifer and Vishny (1997) research.

In their study of relationship between corporate governance and credit ratings, Ashbaugh-Skaife, *et al.* (2006) found that firms with higher values of the corporate governance (which is denoted by GINDEX) have higher credit ratings. They also find that credit ratings are negatively associated with both the number of block holders who own at least 5 percent shares of firm, and CEO power on the board, while credit ratings are positively related to: the degree of financial transparency; overall board independence, board stock ownership and board expertise. They show that moving from the lower quartile to the upper quartile of the GINDEX doubles a firm's chances of receiving an investment grade credit rating. In so doing they also suggest that weak governance can result in firms incurring higher debt financing costs. Alali, *et al.* (2012) used governance score (Gov-score) of Brown and Caylor (2006), the Gomper's G index and an entrenchment score of Bebchuk, *et al.* (2009) to proxy for corporate governance. Their findings suggest that firms with stronger corporate governance have a significantly higher credit rating, and that this association is emphasised smaller firms relative to larger firms. They further found that an 'improvement in corporate governance is connected with improvement in bond-ratings'.

Ouniand Omri (2010)examine the relationship between financial attributes, corporate governance and target credit ratings they found that governance mechanisms and financial attributes are used by managers to achieve desired credit rating. They further deduce that firms set credit ratings targets first then make decisions to bring their credit ratings to those fixed targets. They also found that the deviations from the target credit ratings provide different information and can influence the firm's financing choices. Sunil and Ghoshb (2012) have assessed the relationship among corporate governance attributes and corporate discloser. Their conclusion reflected a positive relationship between liquidity, ratio of audit committee members to total board members, board size, firm size, family control, profitability, CEO duality, and the extent of corporate disclosure. However, leverage, board composition and firm's age has negative impact on the degree of corporate disclosure.

2.2. Impact of Credit Rating on Firm Performance

Some studies have investigated the impact of credit rating on firm performance. In this regard Singal (2013) has conducted research on credit rating and its impact on firm performance. According to study credit rating is intended to measure a solvency of firm and it depends on previous and current and expected future performance of firm. The study further illustrate that credit rating is apposite measure for performance assessment and there credit rating measure should directly related with expected performance measures. Firms with highly capital-intensive and leveraged use credit rating as measuring tool to assess the financial condition of their firms. Certainly, a study has shown that credit rating changes straight away influence the stock prices and bond prices in the expected direction [Holthausen and Leftwich 1986). Therefore, they considered firm's credit rating as important measure of performance of an organisation.

Dichev and Piotroski (2001) have discussed many points in their study regarding to bond rating changes and its impact on stock market performance. They argue that small firms are underperformed due to low credit quality and larger downgrades. This is may be because of information inefficiencies for small firms and less analyst exposure. The study further argues market fails to predict the inverse inferences of downgrades on future performance of firm. Moreover, credit rating changes reflect the changes in fundamentals of firm, especially distribution of future cash flows. Graham and Harvey (2001) have conducted research on theory and corporate finance practice. They found credit rating as important factor in debt decision, because it provides an independent valuation firms' ability to timely payment of debts. Thus, credit ratings can affect the cost of debt and financing structure of firm; eventually it determines the probability of survival of firm. Furthermore, rated businesses and financial strategies of firms can greatly influence future cost of capital and hence; performance of firms.

De and Kale (1993) conducted research on topic "Information in Bond Ratings and the Demand for Rating Services". In the context of signaling theory, they argue that firm has confidential information about their financial strength and it shared this information with public at a cost. They found that financially strong firms have the higher returns and good credit ratings, which signals good firm quality. Similarly, in this context, Kisgen (2006) has suggested that credit ratings are signal to firm quality, and if markets identify them as adding value, then credit ratings changes can signal changes creditworthiness of firm. Paul and Wilson (2007) investigated the determinants of trade credit. They argued that financial strong firms face low default risk and expected to remain solvent. Rösch (2005) suggested that credit ratings can distinguish between surviving firms and failing firms.

Pottier and Sommer (1999) and Adams *et al*. (2003) also supported this statement that higher business growth is an indicator of better financial strength of firm. Thus these statements indicate a positive association between growth of firm and credit ratings, as ratings monitors the agents of firms [Sylla (2001)]. In addition, higher growth rates in corporate activities are related with better credit ratings. Moreover, profitability is a apparent sign of the risk level that is related with firms [Fink, *et al.* (2006)] and their capability to examine debt; it is also related with propensity to default of firm   [Altman (1968)]. Furthermore, Adams, *et al*. (2003) argued that higher profitability of firm associated with lower insolvency risk; at the same time as Daniels, *et al.* (2009) supported that profitability plays a significant role in helping to entry to capital markets. Thus, higher profitability levels are related with a greater propensity and better credit ratings [Gonis, *et al.* (2012)].

2.3. Impact of Credit Rating on Stock Returns

Modern finance theory postulates a positive relationship between risk and return. Various researchers have explored the relationship between credit risk and return through different methods [Pinches and Singleton (1978)]. Kaplan and Urwitz (1979) examined the impact of credit rating announcements on the security returns and found no significant returns and their results also suggested that credit rating agencies only had access to public information and their ratings have no added value to the investors. On the other hand, the results of other researchers argued that the rating agencies have information that is not available in the public domain and that the stock market reacted significantly to the relevant information.

Ederington and Yawitz (1991) have indicated that the rating agencies are the low cost providers of such information. Danos, Holt, and Imhoff (1984) have concluded that bond rating agencies possess expert judgment and are specialists at processing information related to firm's financial condition. Cornell, Landsman and Shapiro (1989) also argued that modifications in bond ratings may have information content because they reflected a more informed estimate of the intangible asset values of a firm and the implicit claims on an entity by other stakeholders. Some researchers investigated that firms with lower credit ratings have higher return then good rating firms. For example, Dichev (1998), Campbell, Hilscher and Szilagayi (2008), have reported that cross-sectional relationship between credit risk and return is significantly negative.

Pinches and Singleton (1978) have examined the impact of bond rating changes on stock returns. They have found that there is no evidence of any upward or downward drift in the cumulative abnormal returns before or after the month of the bond rating change. Their results indicate that the investors have realised the overall improvement or deterioration in a firm's financial condition and the information content of the rating changes have been fully discounted by

the month of the change. A study by Griffin and Sanvicente (1982) partially has confirmed these results. In their study they have examined the adjustments of common stock prices eleven months prior and in the month during the rating change announcement. Grier and Katz (1976) have also found that the new information is not instantaneously absorbed by the industrial bond price and there is a step-by-step price adjustment after the rating change for a significant period.

Griffin and Sanvicente (1982) have explored the common stock price reaction to the rating changes. They examined the price changes in the eleven months preceding the announcement and during the month of announcement itself. They have used a controlled portfolio method to test the cumulative residuals significance between the event and controlled samples. The control portfolios used in their study are constructed by matching on beta, industry, and key financial variables. They have found that the cumulative abnormal returns are significant in either the preceding eleven months or the month of announcement for the downgrading stocks, whereas, are insignificant in the month of announcement for the upgrading stocks.

Holthausen, *et al.* (1985) have used daily stock returns to investigate the effect of bond rating changes on stock prices. They argued that using monthly data may increase the probability that the price response is due to other information released during the month. They perform the statistical test on the two groups separately and also investigate the potential determinants of the cross-sectional variation in the price response to rating changes. The results suggest that the downgrades are related to negative abnormal stock returns in the two-day window either in the contaminated or non-contaminated group. There is little evidence of abnormal returns associated with upgrades changes in ratings.

Matolcsy, *et al.* (1995) investigated the incremental informational content of changes in bond rating in case of Australian stock market. Their findings reflected that the informational content of unexpected accounting income number as the confounding announcements. There are significant abnormal returns that could be explained by the joint information content of unexpected accounting income numbers and the rating changes. They further argued that the abnormal returns were significant for the downgrading bonds and non-significant for the upgrading bonds. Hand, *et al.* (1992) and Creighton, *et al.* (2007) examined the effects of rating changes with change in both stock returns and bond yield. Thus they have found significantly negative average abnormal bond and stock returns in downgrades, whereas weaker positive average abnormal bond and stock returns in upgrades. Creighton, *et al.* (2007) observe that both positive and negative rating movements affect bond and stock prices; hence stock return, and the rating announcement effects are larger for small firms especially being downgraded from investment to speculative grade in Australian market.

Elayan, *et al.* (2003) further investigated effects of credit rating announcements on the share prices in case of New Zealand stock market. They employed the daily stock return data from July 1990 to June 2000. They found significant price reaction with rating announcements. Weinstein (1977) found evidence of price change during the period from eighteen to seven months before the rating change is announced, but no evidence of any reaction during six months prior to the rating change, and there is little reaction during the month of the change or for six months after the change. Cantor and Packer (1997) and Pottier and Sommer (1999) have subscribed to the notion that if there is greater uncertainty about their true default risk companies solicit a credit rating. They have hypothesised that a higher probability of default is a strong reason for firms to attain additional rating in an attempt to communicate information about true credit quality. On the other hand, firms facing higher chances of bankruptcy are less likely to seek a rating, since resulting low rating and associated higher debt costs will outweigh any benefits. An implicit element of returns for both downgrades and upgrades can arise due to the fact that for companies in emerging business risk assessment is business growth. The positive signals sent by increases in business outweigh the potential shortcomings of high growth.

Dichev and Piotroski (2001) investigated the long-term stock returns following bond rating changes. The abnormal returns and buy-and-hold returns are calculated in terms of three-month, six-month, first-year, second, year, and third year. Their results reflected that the upgrade rating stocks have no significant abnormal returns and downgrade ratings stocks have significant abnormal returns. They have also conducted the test on the long-run returns conditional on firm size, a preceding quarter's earnings surprise and credit quality. The statistical results are consistent with the downgrade underperformance. Underperformance used for small firms and firm with low credit quality. Choy, *et al.* (2006) also conducted study on the impact of credit rating revisions on stock returns in case of Australian firms rated by Standard & Poor's and Moody's. Their results reflected that only downgrades contain price-relevant information. Linciano (2004) has investigated effect of credit rating changes on stock returns of Italian listed firms announced by Moody's, Fitch and Standard & Poor's for. According to anticipation, direction, sector of issuer, reason of rating action and presence of concurrent news rating changes are categorised. They have concluded in their results that stock return response to credit rating changes is comparatively moderate or insignificant in general where as significant abnormal returns are only included for negative watches and for actual.

Poon and Chan (2008a) investigated the determinants of credit rating and relationship between credit rating and stock returns in case of Chinese listed firms. They found profitability, firm size, and capital structure and past stock

market performance as significant determinants of Chinese credit ratings. They further suggest that firm with higher credit ratings tends to have higher returns on their stocks. Further, Poon and Chan (2008b) conducted a study on the information content of credit rating announcements in China. The analysis showed an asymmetric certification effect and an information content of credit rating changes. When there are changes in credit ratings the firm size and manufacturing industry add to the negative abnormal returns.

Giulio, *et al.* (2010) have conducted study on credit ratings in which they argue that credit ratings represent, by construction, a short-run prediction of default, plausibly embedding many dimensions which are not completely measured by financial and economic regressors they further argue that accuracy of standard risk assessment devices, such as official credit ratings or risk management procedures internally maintained by financial institutions might possibly devote too few attention to some important, economic rather than financial factors.

2.4. Impact of Economic Conditions on Stock Returns

The relationship between economic fundamentals and stock returns has been studied by a large number of researchers. For instance, Chen, Roll and Ross (1986) have studied 'The Effect of Macroeconomic Factors on the London Stock Return (a Sectoral Approach) and conclude that the macroeconomic factors have a significant effect on the UK stock exchange. In their research, they find that several of these economic variables to be significant in explaining expected stock return during the tested period. They observe that industrial production changes in risk premium, twist in the yield curve, and measure unanticipated inflation and changes in expected inflation during period when these variable, are highly volatile, are significant in explaining expected return. They find that consumption, oil prices and market index are not priced by the financial market. They conclude that stock returns are exposed to systematic economic news that is priced by the market. Poon and Taylor (1991) support this result and find that there is no relationship between the macroeconomic variables and stock market return. However, each macroeconomic variable is insignificantly influences the stock returns in different manner. That is, macroeconomic variables might positively insignificantly influence one sector, but other sector might be negatively and insignificantly affected.

Rashid (2008) by using cointegration and Granger causality tests suggest that there is cointegration between the stock prices and macroeconomic variables such as consumer prices, industrial production, exchange rate and the market rate of interest. Estimates of bivariate error-correction models revealed that there is long-run bidirectional causation between the stock prices and all the said macroeconomic variables with the exception of consumer prices that only lead to stock prices. Industrial production is an economic report that measures

changes in output for the industrial sector of the economy. The industrial production is highly sensitive to interest rates and consumer demand. This makes industrial production an important tool for forecasting future GDP and economic performance. Fills (2009) established the relationship between stock market, consumer price index (CPI) and industrial production in Greece and the impact of oil prices, and suggested that industrial production affects stock market cycles positively but the influence is not significant.

Apergis, Artikis, and Eleftheriou (2011) examined the relationship between excess stock returns and the business conditions for emerging markets. The panel Generalised Method of Moments (GMM) estimator methodology is used in their study. The empirical results reflected that various macroeconomic factors such as gross domestic product (GDP), consumer price index, liquidity, short-term interest rate, trade deficit and government deficit plays vital role in explaining excess returns. Ahmed, *et al.* (2013) investigated the co-determinants of capital structure and stock returns of nonfinancial firm listed in KSE. They used GMM technique to deal with endogeneity. Their results suggested that stock returns and leverage affect each other but leverage effect the stock returns more than stock returns effect leverage. The results further show that firm specific factors are significant determinants of leverage and stock returns. The firm specific factors such as profitability is negatively related to leverage and positively related with stock return, growth is positively influenced the leverage and stock return whereas liquidity is negatively influenced the leverage and stock returns. Moreover, they found insignificant effect of firm size on leverage and firm's stock returns. Mehr-un-Nisa and Nishat (2011) also investigated the empirical association between the stock prices, financial factors and macroeconomic factors in KSE. They find significant relationship between behaviour stock price, financial factors of firm and macroeconomic factors.

The literature review suggests that credit ratings provide an independent assessment of ability of firm pay its financial obligations in due date. In case of Pakistan practice of credit rating is at initial stages and research on credit ratings and its significance is yet to be explored. No specific study has been done in Pakistan regarding to credit rating. This study tries to fill the gap in academic research as combination of entity rating, firm performance, stock return and governance, which has not been studied before in Pakistan.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

This section discusses the theoretical foundation and conceptual framework of the model for empirical testing. The working hypotheses are also developed based on the theoretical literature and empirical literature presented in Section 3.

3.1. Theoretical Framework

3.1.1. *Agency Theory*

In general terms, agency is the relationship between two parties such as principal and agent. This relationship occurs when one party (principal) hire the other party (agent) to perform services on behalf of principal. If there are inefficiencies and incomplete information agency problem can arise. Hence Agency theory is concerned with resolving problems that can exist between principal and agent. Credit rating has information content that reduces agency conflict between management and small shareholders.

Jensen and Meckling (1976) agency theory framework, there are two types of agency conflicts faced by debt stakeholder, which increase the probability of default risk, hence, reduce the value of their claims. The first conflict exists between management and all external stakeholders (bondholders and shareholders). When manager have inducement to chase their own interests at the expense of external bondholders then moral hazard problem create by information asymmetry. Managers with self-interest incentives can take several forms including overcompensation, shirking, consumption of perquisites, all of these factors increase the agency risk and decrease the expected value of the cash flows faced by firms and external stakeholders, and when the firm's expected cash flows decline, the default risk increases and hence results lower credit ratings (Ashbaugh-Skaife, *et al.* 2006). The second conflict is between bondholder and shareholders. In levered firms shareholders have incentives to transfer wealth from bondholders. This transfer can impact mean and the variance of future cash flows of firm in many forms. For instance, if shareholders demand for repurchases or dividends from firm's assets (direct payouts) thus do not support manager to invest in projects with positive net present value, and mean of future cash flows distribution of firms will be lower. Hence the reduction in expected future cash flows of firms increases default risk of bond holder. Similarly, the variance of expected cash flows of firms will be increased if shareholder forces manger to make investment in riskier projects, thus, higher default risk will be faced by bondholder. In above two examples bondholders faced greater risk in that their financial obligations on the cash flows of firm will not be fully paid whereas shareholders potentially are better off [Ashbaugh-Skaife, *et al.* (2006)].

Based on agency theory [Jensen and Meckling (1976)], there is positive relationship between corporate-governance ratings and company performance exist. The extent that higher corporate-governance ratings proxy for better actual corporate-governance practices, higher corporate-governance ratings should translate into improved operating performance and a higher market value.

3.1.2. *Wealth Redistribution*

Zaima and McCarthy (1988) are among the first who investigated the effect of bond ratings on stock price, and risk. They stated that there is an intrinsic conflict between bondholders and shareholders. Further they suggested that according to the wealth redistribution hypothesis, a downgraded credit rating should be associated with increased share price and vice versa. Goh and Ederington (1993) have separated the credit rating downgrades in their study. They conclude that the market value and risk of firm can adjust gradually and continually, and therefore when the actual rating change occurs it only reflects information already incorporated in the market price.

Wealth redistribution hypothesis indicating that rating upgrades are followed bond and stock return downgrades [Zamia and McCarthy (1998)]. In levered firm shareholders have incentive to transfer wealth form bondholder. So shareholders increase their returns at expense of bondholders. Shareholders engaged in riskier project in pursue of higher returns, which impact the value of firm and stability of cash flows and hence the credit ratings of firm An alternative explanation for wealth redistribution hypothesis is that a greater variance of investments and cash flows might lead to a lower credit rating, because variance in investment in cash flows increases the default risk of firm which ultimately influences the credit ratings of firm.

Ashbaugh-Skaife, *et al.* (2006) have analysed corporate governance structure and practices of firm. They have tested for possible wealth redistribution effects. They have found that number of block holders of firm has negative influence on firm's credit ratings; this is consistent with wealth redistribution hypothesis. Moreover their results show that shareholder rights have negative impact on credit ratings. They suggest that greater shareholder rights negatively related to firms' credit rating and hence, support wealth redistribution hypothesis.

3.1.3. *Information Content Hypothesis*

The credit rating agencies describe the ability of firms to repay their financial obligations, and thus disclosing essential information to the lender. The credit rating agencies' capability to overcome the problem with information asymmetry depends on to what extend the reports contain new information for the market. This is often referred to as the information content.

Most credit ratings studies focused on whether changes in credit rating encompass pricing-relevant information. Changes in credit ratings can give signal to market as the creditworthiness of the issuer is changed. Usually changes in stock return are significantly aroused with credit rating changes. According to the information content hypothesis stock prices are expected to react on the date of announcement of credit rating change.

Foster(1986) said that the function of ratings are source of information to the company ability, municipal or government to pay bond and interest, source of credit information with intercompany lower cost municipal and government, source of additional financial and other management representation.

3.1.4. *Signaling Theory*

Companies are rated by credit rating agencies on basis of publicly available information. Signaling theory explained why company should give information of financial reporting to external parties. This is result of an information asymmetry between managers as internal parties and shareholders as external parties. That is, managers have more knowledge more about the firm's prospect than investors [Mungniyati (2009)]. Giving signal to external parties (shareholders), provide reliable financial reporting is one of many methods to reduce information asymmetry. It can shrink indeterminacy of company outlook in future [Wolk, *et al*. (2000)]. Signaling theory suggests that how company should provide its financial reporting for its users. This information about what management has done to realise the purpose of shareholder. This is used to promote the company and to show that company is better than others [Mungniyati (2006)].

3.2. Development of Hypothesis

Based on the empirical literature presented in section 3 and theoretical foundation mentioned above the following hypothesis are formed:

H_1a: firm specific variables are determinants of credit ratings in Pakistan
H_1b: corporate governance variables are determinants of credit ratings in Pakistan
H_2: There exist a relationship between credit ratings and firm performance,
H_3: There is a relationship between credit ratings and stock return

4. METHODOLOGY AND DATA

This section presents the model specification analytical framework, variable description, data and data sources.

4.1. Model Specification

4.1.1. *Determinants of Credit Ratings*

Based on the theoretical and empirical literature mentioned in section 3firm specific variables and corporate governance variables determine the credit rating of the firm as suggested by Altman and Rijken (2004), Ashbaugh-Skaife,

et al. (2006), Al-Khawaldeh (2012) and Alali, *et al.* (2012). The following empirical specification is used to estimate determinants of credit rating:

$$CR_{it} = \alpha_0 + \alpha_1 LEV_{it} + \alpha_2 Size_{it} + \alpha_3 ROA_{it} + \alpha_4 TQ_{it} +$$
$$\alpha_5 CAP_{INT_{it}} + \alpha_6 LOSS_{it} + \alpha_7 TYP_{SEC_{it}} + \alpha_8 BS_{it} + \alpha_9 BH_{it} +$$
$$\alpha_{10} DUAL_{it} + \alpha_{11} SHT_{it} + \alpha_{12} AQ_{it} + \varepsilon_{it} \qquad \dots \qquad \dots \qquad \dots \qquad (1)$$

Where;(CR) is Credit rating of firm, (LEV) is leverage**,** firm size (Size), Tobin's q (TQ), capital intensity (CAP_INT), Loss Propensity (LOSS) and type of sector (TYP_SEC) are used as firm specific variables. Corporate governance proxies such as board size (BS), number of block holders (BH)**,** CEO duality (DUAL)**,** shareholder's rights (SHT)**,** audit quality (AQ) are used in the study to predict the credit rating of firms in Pakistan. ε_{it} is error term.

4.1.2. *Impact of Credit Ratings on Firm Performance*

The following regression to examine the impact of credit ratings on firm performance following the study of Holthausen and Leftwich (1986), Pottier and Sommer (1999), Graham and Harvey (2001), Ashbaugh-Skaife, *et al.* (2006), Bissoondoyal-Bheenick, *et al.* (2011), Alali, *et al.* (2012) and Singal (2013).

$$Perf_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 LEV_{it} + \beta_3 Size_{it} + \beta_4 DPS_{it}$$
$$+\beta_5 LOSS_{it} + \beta_6 SP_{it} + \beta_7 BS_{it} + \beta_8 BH_{it} + \beta_9 DUAL_{it}$$
$$+\beta_{10} GDP_{it} + \varepsilon_{it} \quad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (2)$$

Performance is measured by Tobin Q and return on assets. To examine the impact of credit ratings on firm performance firm specific variables and corporate governance proxy variables are same as used in model (1). GDP is use in this study to examine the impact of economic conditions on performance in Pakistan.

4.1.3. *Impact of Credit ratings on Stock Return*

In this Model the effect of credit rating along with the firm specific variables and macroeconomic variables are estimated in the spirit of Chen, Roll & Ross (1986). The relationship of credit rating and stock return is shown as:

$$SR_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 LEV_{it} + \beta_3 Size_{it} + \beta_4 ROA_{it} + \beta_5 TQ_{it}$$
$$+\beta_6 LIQ_{it} + \beta_7 DPS_{it} + \beta_8 BS_{it} + \beta_9 DUAL_{it} + \beta_{10} SHT_{it} + \beta_{10} AQ_{it}$$
$$+\beta_{10} GDP_{it} + \beta_{10} EXR_{it} + \beta_{10} CPI_{it} + \varepsilon_{it} \qquad \dots \qquad \dots \qquad \dots \qquad (3)$$

SR is stock return. Leverage, firm size, return on assets, liquidity, Tobin's q and dividend per share are used as firm specific variables. Corporate governance variables are included in this model are CEO duality, board size, shareholder's right, audit quality and block holder. Whereas, exchange rate, inflation (measured by consumer price index), GDP per capita, inflation

(measured by CPI)and exchange rates are used to capture the influence of macroeconomic conditions on stock return.

4.2. Estimation Technique

Two estimation techniques are followed in this study. To estimate the determinants of credit rating Ordered Probit approach is followed as estimation technique. The panel data estimation technique is adopted to estimate relationship between credit rating and firm performance and also for credit rating and stock returns.

4.2.1. *Ordered Probit Model*

The structural credit rating model is used in this study following the model developed by Adams, *et al.* (2003). Mckelvey and Zavoina (1975) introduced the Ordered Probit model is intended to solve problems with the ordinal nature. In the previous literature the use of this regression model has been justified by Pottier and Sommer (1999), Bissoondoyal-Bheenick (2005). Following latent variable model is considered:

$$y_i^* = x_i\,\beta + \varepsilon_i \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (4)$$

where y_i^* is an unobservable latent variable that measures the level of risk, x'_i is a vector of explanatory variables of firm 'i', β is a vector of unknown parameters and ε_i is a random disturbance term. If the distribution of ε_i is chosen to be normal, then ultimately this produces an Ordered Probit model, which appropriate than OLS in this situation because of the ordinal nature of the dependent variable (Ederington1985, Pottier and Sommer1999).

As y_i^* is unobserved, it is assumed that y_i^* is related to the observed variable y_i, in this case, long term ratings which are expressed in the following way:

$$
\begin{aligned}
y_i &= 1 \;\; if\, \varepsilon_0 < y_i^* \leq \varepsilon_1 \\
&= 2 \; if\, \varepsilon_1 < y_i^* \leq \varepsilon_2 \\
&= 3 \; if\, \varepsilon_2 < y_i^* \leq \varepsilon_3
\end{aligned}
$$

here the εs ($\varepsilon_1 < \varepsilon_2 < \varepsilon_3$) are unknown parameters to be estimated. The ordinal variable, y, is coded on a three-point scale from 1 to 3, where 1 represents the poorest condition and 3 superior financial strength. A higher value of a variable with a positive coefficient, β, indicates a greater probability of a higher rating. This model is further extended by including corporate governance attributes in the basic model. Governance variables are included in the model to examine whether; they predict the credit rating of firms in Pakistan. Corporate governance proxies are taken in the study on the basis of prior researches (Ashbaugh-Skaife*et al.* (2006), Alali*et al.*(2012), Al-Khawaldeh (2012) and Singal (2013).

4.2.2. *Panel Data Estimation Technique*

Panel Data Estimation Technique is used to estimate the effect of credit rating on firm performance and on stock returns. Empirical researches on credit rating and performance and stock returns possibly go through from two sources of discrepancies which are missing variables and endogeneity biases and generalised method of moment GMM estimator which help to correct problem of omitted variable and endogeneity biases.

When panel data is used, the individual effect can be taken as a common, fixed or random. To compare between common effect model and fixed effect model F test is used. Hausman test is performed to select the most suitable model between fixed effect model and random effect model. It has the null hypothesis that assumed error term and independent variables are not correlated.GMM estimators are consistent under the condition that the instruments should be valid. To test the validity of instruments Sargen J test of over identifying restrictions is applied. It checks the overall validity of the instrumental variables by examining the sample analog of the moments conditions. Its null hypothesis is that instruments are valid.

4.3. Sample and Data

Data for credit rating is collected from Pakistan credit rating agency (PACRA). This study has selected the firms whose entity rating available from PACRA for the analysis. The data for all firm specific variables is collected from Karachi Stock Exchange website, Securities and Exchange Commission of Pakistan (SECP), Balance Sheet Analysis, companies' annual reports, and data for macroeconomic variables is obtained Handbook of State Bank of Pakistan (SBP) covering the period of 2007-2011.

The Credit Risk Rating of the financial and non-financial firms are assigned by Pakistan Credit Rating Agency (PACRA) is obtained from the PACRA web site. The procedure attempted by [Adams, Burton, and Hardwick (2003)]. PACRA has divided credit ratings into two categories such as short term ratings and long-term ratings. The ratings considered in the current study are long term ratings keeping in mind the long term stabilisation of a firm. For the dependent variable we warped the multiple ratings into three categories of credit ratings, which convey ordinal risk evaluation. Each category is mapped into a range of credit ratings as follows:

Rating category 1: AAA, AA, A
Rating category 2: BBB, BB, B
Rating category 3: CCC, CC, C, D

The variables, their construction and source of data is presented in Table 1.

Table 1

List of Variables

Variables	Symbol	Description
Firm Specific Variables		
Firm Size	Size	Logarithm of total assets
Leverage	LEV	Long term debt divided by total assets (ratio)
Capital Intensity	CAP_INT	Gross fixed assets divided by total assets.
Return on Asset	ROA	Net income divided by Total Assets (ratio)
Liquidity	LIQ	Cash ratio =Cash and cash equivalents / Current Liabilities
Loss Propensity	LOSS	1 if ROA is negative in the current and prior fiscal year, 0 otherwise.
Industry Type	TYP_SEC	1 if firm is a financial sector, 0 otherwise
Share Price	SP	Market value of per share price (Rs.)
Dividend	DPS	Dividend per share
Share Issued		Outstanding number of share (No.)
Tobin's Q	TQ	(Long term debt plus Market Capitalisation) divided by Total Assets (ratio)
Stock Return	SR	Current sock return of firm divided by previous stock return minus one
Macroeconomic Variables		
Consumer Price Index (Inflation)	CPI	Measure of estimating average price of goods and services
Exchange Rate	ExR	The price of one country's currency expressed in another country's currency
Gross domestic Product	GDP	Total domestic production in country
Corporate Governance Variables	symbol	Retailed measure
Board Size	BS	Number of board of directors
Block Holders	BH	Number of block holder holding 10% or more shares.
Shareholder Right	SHT	1 if firm shareholder has right to vote, 0 otherwise
CEO Duality	DUAL	1 if CEO is also chairman of company, 0 otherwise
Audit Quality	AQ	1 if the company is audited by a top four companies, 0 otherwise.

5. EMPIRICAL RESULTS

The empirical results and results discussion are presented in this section.

5.1. Descriptive Analysis

The summary statistics of the all independent continuous variables performed over the period of 2007 to 2011 on the sample of 63 financial and nonfinancial firms of Pakistani listed at Karachi stock exchange (KSE) presented in Appendix A Table A1. The results show the average leverage is 3.18 percent, indicating that debt is 3.18 times of total equity that is, the higher side of debt shows that Pakistani firms depend on debt rather than equity. The average profitability (ROA) is 9.7265 indicating that the firms in sample are profitable, and are strong enough to face financial distress. The average log of total assets (size) is 4.56 indicates that large firms achieve from economies of scale and are stronger enough to of risk of default; hence large firms gain higher credit rating, lower default risk. The average capital intensity is 31.17 percent, which shows that 31.17 percent of a firm's assets are fixed assets. The average Tobin's q is 0.5191 and its median is 0.3377. Tobin's q measures growth opportunities, which are considered to be an indicator for the success of firm and the height of its profitability. The low average dividend per share ratio (0.0051) shows that firms in the sample do not pay dividends. We find that average of block holders that own 10 percent or more is 2.01 and 2.00 median. Board size is comparatively smaller in firms in Pakistan. The average (median) GDP is 3.9(4.3) representing the deteriorating economic position of Pakistan during the period. Inflation is on average around 13 percent in Pakistan reflecting higher price of FOC as well as the consumer goods indicating weaker position of investors.

5.1. Correlation

All the variables in current study are approximately normally distributed. In Appendix A Table 3 the correlation matrix shows that all variables are independent of one another, this means that there is no multicollinearity problem exists between the explanatory variables used in this study.

Panel (A) present correlation among firm specific variables and with credit ratings. The correlation results shows that ROA, size, industry type, DPS and share price are positively and significantly correlated with credit rating, and Tobin's Q is insignificant. Leverage, loss and capital intensity is negatively and significantly correlated with credit ratings. Correlation among corporate governance variables and between these variables and credit ratings is presented in panel (B). Block holder is negatively and significantly correlated with credit rating. Panel (C) presents correlation between macroeconomic variables and between these variables with credit rating.

5.2. Regression Results

This section presents the regression results for the models specified in above.

5.2.1. *Results of Determinants of Credit Ratings in Pakistan*

In the analysis of determinants of credit rating three models are estimated in this study. Model 1 firm specific variable are used to test the predicted relations between firm characteristics and credit rating. In model 2 governance variables are included as determinants. Model 3 reports full model consisting of both firm specific factors and corporate governance variables to test their relationship with credit ratings. The study uses Probit regression model to estimate the regression for these variables because dependent variable that is credit rating is ordinal in nature this model is also evidenced in prior studies such as Ederington (1985); McKelvey and Zavoina (1975); Pottier and Sommer (1999); Adams, *et al*. (2003) and Bissoondoyal-Bheenick (2005).

The first model considers the firm specific variables to test whether profitability, leverage size, growth opportunities, capital intensity industry type, propensity of loss are related with credit ratings of firm. The results of model 1 show that profitability, size and growth opportunities show significant and positive relationship with credit rating of firm. This indicates that more profitable, large sized firms with more growth opportunity are likely to have higher credit rating. Whereas firms with more leverage and loss propensity are less likely to be rated high as their coefficients are negatively and significant related with firm's credit rating.

Probit regression result indicates inverse relationship between debt level and credit ratings of firms in Pakistani context. A positive relationship between the firm's size and credit ratings revealed that firm size is an important decisive factor in determining credit ratings. These results are consistent with Horrigen (1966); Adam, *et al.* (2003); Ashbaugh-Skaife, *et al.* (2006) and Al-Khawaldeh (2012) and Alali, *et al.* (2012). These results also supports the signaling theory, which states that larger firms have higher expected future cash flows and are stronger enough to face financial distress and bankruptcy hence larger firm achieve higher credit ratings. Positive relationship between growth variable (Tobin's q) and credit ratings indicates higher growth opportunities in Pakistani firms. According to Al-Khawaldeh (2012) "higher growth may signal to investors to exhibit high performance which should result in higher future profits, as result firm achieve high credit ratings". Signaling theory supports this positive and significant influence of growth opportunities on credit rating. Similarly, the positive association between capital intensity and credit ratings indicates lower default risk and higher credit ratings (Ashbaugh-Skaife, *et al*. (2006)].

Table 2

Results of Determinants of Credit Ratings

Variables	Model 1	Model 2	Model 3
Leverage	-0.14**		-0.12**
	(-1.80)		(-1.83)
Profitability	0.10***		0.08**
	(2.40)		(1.84)
Firm size	0.52**		0.41**
	(1.80)		(1.93)
Growth opportunities	0.20**		0.15
	(1.82)		(1.14)
	0.21		0.26
	(0.27)		(0.24)
Loss propensity	-0.93*		-0.55**
	(-1.75)		(1.80)
Industry type	0.76		-0.14
	(1.49)		(-1.85)
Audit quality		0.015	-0.007
		(0.002)	(-0.001)
CEO duality		0.99***	0.05***
		(2.20)	(1.86)
Block holders		-0.57***	-0.61***
		(-2.52)	(-2.43)
Board Size		0.44***	0.28**
		(2.35)	(1.73)
Shareholders right		0.91**	0.99**
		(1.85)	(1.79)
Pseudo R^2	0.31	0.32	0.36
Observations	313	313	313

Notes: The left-hand side variable is the credit rating of firm. Robust coefficients and z-statistics reported in this table. * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.The Hausmen test suggest Fixed effect Model. The p-values of the J-statistics show that all instruments used in the study are valid.

Model 1: Credit Ratings = f (firm specific variables)

Model 2: Credit Ratings = f (corporate governance variables)

Model 3: Credit Ratings = f (firm specific variables, corporate governance variables).

The results show that both financial and nonfinancial industry have potential to determine the credit rating of firms in Pakistan, although the percentage of firms in higher credit categories is larger for financial firm than non-financial firms in current study. This result is in line with Horrigan (1966); Kaplan and Urwitz (1979); Ashbaugh-Skaife, *et al*. (2006); Al-Khawaldeh (2012).

The second Model considers corporate governance variable to test whether they predict the credit ratings of firm. Pseudo R^2 is increase from 0.30 to 0.32 when corporate governance variables are introduced in this model. This shows that governance variables more explanatory power to explain firm credit ratings. Additionally, corporate governance variables capture more variation in credit ratings than firm specific factors [Ashbaugh-Skaife, *et al.* (2006)]. CEO duality is positively significantly related to credit ratings. This indicates that having two positions in an organisation CEOs are more responsible towards making corporate decision ns and perform in a way to achieve firms' objectives. This finding is consistent with Dahya and Travlos (2000). The negative coefficient shows that there is significant and inverse relationship between number of block holders and credit rating and as block holding increases the probability of the firm to be rate rated lower increases. This result is in line with Bhojraj and Sengupta (2003) and Ashbaugh-Skaife, *et al.* (2006). This result also supports wealth redistribution hypothesis that due to influential shareholders of firm, block holders can exercise influence over management to secure benefits that are unfavourable to bondholders. Large board size and credit ratings are positively related, because large board size faces low agency risk and leads to higher ratings [Bhoraj and Sengupta (2003)]. The positive and marginally significant relationship between shareholders' rights and credit ratings reflects that stronger shareholder rights of firm have higher value of firm and have higher profits [Gompers, *et al.* (2003)]. This result is reliable with previous studies such as Ashbaugh-Skaife, *et al.* (2006). The Third model considers firm specific variables and corporate governance variables to examine the combine effect of both attributes on credit ratings. The model is more significant with 0.36 Pseudo R^2 than Model 1 and Model 2. In summary, the results reflect that corporate governance variables and firm specific variables determine the credit rating of firms; however, corporate governance variables exhibit more proportion in predicting credit ratings of firm than firm specific factors. Firm specific factors provide extra information for credit ratings.

5.2.2. *Results of Impact of Credit rating on Firm Performance*

To estimate the impact of credit rating on firm performance, the credit rating, firm specific variables and economic conditions are regressed on firm performance. Two indicators of firm performance are used: ROA and Tobin's q[1]. The panel data estimation technique is applied and common effect model, fixed effect model and random effect model are estimated. The fixed effect model is supported by Hausman test. To deal with endogeneity the generalised method of moments (GMM) is used in this study. The coefficients and their corresponding t-values in parenthesis are presented in Model 1 of Table 5. In

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[1]Tobin's q is used as market measure of firm performance.

this study to examine the impact of performance of firm on credit ratings three econometric regression models are developed. Performance is measured by ROA and Tobin's q in Model 1 and Model 2 and respectively.

The results of performance models are reported in Table 3. In above analysis, credit rating shows significant and positive effect on firm performance in all three models. The loss propensity is negatively associated with ROA and Tobin's q whereas with book to market value has no significant impacted. The positive association between credit ratings and ROA indicates that a firm with higher credit ratings has higher corporate performance [Ouni and Omri (2010)]. The firm specific factors such as size, DPS and growth opportunities (measured by Tobin's q); have positively and statistically significant relationship with firm

Table 3

Results for Impact of Credit Rating on Firm Performance

Variables	Model 1 ROA	Model 3 Tobin's Q
Credit Ratings	1.21***	0.12**
	(2.45)	(1.99)
leverage	-0.42	0.89***
	(2.10)	(4.15)
size	0.87	-0.09***
	(1.56)	(-3.45)
DPS	0.05	0.02
	(0.78)	(1.13)
Loss	-0.30***	-0.05***
	(-2.01)	(-2.05)
Share price	0.04**	0.06)*
	(1.89)	(2.23)
CEO duality	0.43***	0.06
	(2.79)	(1.67)
Board size	2.87***	0.09***
	(2.56)	(2.48)
Block holders	0.84**	0.08***
	(1.23)	(2.57)
GDP	0.45	0.055
	(0.23)	(1.10)
R-Squared	0.25	0.32
J-stat (p value)	0.66	0.41
Hausman (p value)	0.00	0.00

Notes: The left-hand side variable is the credit rating of firm. Coefficients and t-statistics reported in this table. *Significant at 10 percent; **significant at 5 percent; ***significant at 1 percent.The Hausmen test suggests Fixed effect Model. The p-values of the J-statistics show that all instruments used in the study are valid.

Model 1: ROA = f (Credit ratings, firm specific variables)
Model 2: Market- to-book value = f (credit ratings, corporate governance variables)
Model 3: Credit Ratings = f (credit ratings, firm specific variables, corporate governance variables)

performance. This shows that firm with large firm size, higher market to book value and growth opportunities; increases the performance of firm and hence; firm achieves higher credit ratings. Whereas the negative co-efficient of leverage and loss propensity reveals inverse relation with firm performance. The results also reveal positive and significant relationship of dividend per share and share price with performance of firm at 5 percent significance level.

The GMM estimation results reveal that all corporate governance variables such as CEO duality, board size and block holders are positively significant related with firm ROA. The positive association between CEO duality and ROA shows that CEO duality creates sense of strategic decision making and strong management thus strong leadership and management leads firm to achieve better financial performance this finding is in line with Dahya and Travlos (2000).

The positive relationship between block holder and ROA shows "that block holder increases monitoring and control which motivates firms to invest in more profit generating projects" [Mirza and Javid (2013)]. The second column presents GMM results using Tobin's q (performance measure) as dependent variable. The results indicate that credit rating is positively related with firm performance measured by Tobin's q.

5.2.3. *Result of Impact of Credit Ratings on Stock Returns*

Table 6 presents estimation results of model assessing how credit rating along with other firm specific, governance specific and economy specific variables effect stock returns. Model 1 analyses the results of credit rating with firm specific variables and their influence on stock return. The positive coefficient indicates that credit ratings are statistically significantly positively related to stock returns. This shows that credit rating is an important determinant of stock returns in case of Pakistani firm. That is to say that a firm with higher credit ratings tends to have higher stock returns. This result is in line with Poon and Chen (2008a). This result also support signaling theory that credit ratings are signal to market participants to take decision about buying or selling stocks, because according to efficient market theory investors are indecisive about buy a stock at lower price or sell their stocks at higher price thus to achieve higher returns investor purchase high rated investment [Bissoondoyal-Bheenick, *et al.* (2011)].

The financial variables results in Model 1 such as profitability, size and growth opportunities are significantly positively related with stock returns. That is, firm with large size, high profitability and higher growth opportunities provide high return on their stocks in Pakistan. Whereas, leverage and liquidity are negatively significantly affect stock returns. The negative and significant relation between leverage and stock returns indicates that firms pay long term interest debt which reduces company profit hence low return on stocks in Pakistan. The negative and significant relationship between liquidity and stock returns shows that firm with greater liquid stock have low return. These results are in line with Yang, *et al.* (2010); Chen and Chen (2011) and Ahmed, *et al.* (2013)].

Table 6

Results of Impact of Credit Rating on Stock Returns

Variables	Model 1	Model 2	Model 3	Model 4
Credit Ratings	0.57**	0.53*	0.11***	0.54***
	(1.89)	(1.80)	(2.01)	(2.10)
Leverage	-0.44			-0.84*
	(-0.95)			(-1.76)
Size	0.16***			0.43
	(2.83)			(0.18)
Profitability (ROA)	0.013***			0.05
	(2.77)			(1.51)
Growth opportunities	0.51			-1.65***
	(0.01)			(-2.11)
Liquidity	-0.12			-0.19***
	(-0.54)			(-2.61)
Dividend per share	0.08***			0.06**
	(2.63)			(1.84)
CEO duality		0.32		0.10
		(0.71)		(0.55)
Board size		0.34		0.03
		(0.81)		(0.12)
Shareholder's rights		0.31		0.05
		(1.05)		(1.71)
Audit quality		0.06		0.01
		(0.33)		(0.07)
Block holders		-0.11		-0.08
		(-0.83)		(-0.73)
Exchange rate			0.18***	0.17***
			(5.45)	(5.63)
Inflation			-0.13***	-0.23***
			(-5.11)***	(-3.55)
GDP			0.59***	0.71***
			(6.99)	(4.32)
R-Squared	0.23	0.20	0.21	0.35
J-stat (p value)	0.18	0.32	0.13	0.23
Hausman (p value)	0.00	0.00	0.00	0.00

Note: Values in parentheses are underlying student-t values. The t statistics significant at 1 percent, 5
percent and 10 percent levels of significance are indicated by ***, **and *, respectively.

Model 1: stock returns = f (credit rating, firm specific variables)

Model 2: stock returns = f (credit rating, corporate governance variables)

Model 3: stock returns = f (credit rating, business conditions)

Model 4: stock return s= f (credit rating, firm specific variables, corporate governance variables,
business conditions)

Model 2 considers corporate governance variables with credit ratings to examine the influence of these variables on stock return. Credit rating is positively related with stock returns. Governance variables such as CEO duality, shareholder's right and board size is positively related with stock return and block holders is negatively related with stock return. But this relationship is insignificant as all variables have low co-efficient. This indicates that corporate governance variables do not have a significant proportion while predicting the return on stocks in Pakistani firms.

Third model considers effect macroeconomic conditions on stock returns. Three macroeconomic variables such as exchange rate, GDP and inflation rate are used with credit rating as independent variables. Credit rating is also positively and significantly related with stock returns.

Model 4 considers all firm specific, corporate governance and macroeconomic variables with rating, to test the joint influence of these variables on stock return. The results remain the same for all the variables in this model. The positive and significant relationship of credit rating with stock returns in all models shows that credit rating of firms is important factor in determining the stock returns in Pakistan. Firm specific variables have significant role in predicting the stock returns. The results indicate that in this model, macroeconomic variables are also highly significant with stock returns. In conclusion, the results indicate that macroeconomic conditions are considered to have significant proportion in determining stock returns in Pakistan.

6. CONCLUSION AND POLICY IMPLICATIONS

Credit rating agencies (CRAs) play significant role in evaluation of firm default risk. The CRAs evaluate firms on basis of publicly available information. Credit ratings transmit the view of the credit rating agency of the creditworthiness of an issuers' ability to payment of their financial obligations. A good credit rating of firm is considered as a symbol of good quality, financial strength and firm creditworthiness. The firm creditworthiness serves the interests of investors, issuers, intermediaries, borrowers and institutions alike.

The first part of the study deals with determinants of credit ratings in Pakistan. The study suggests that firm specific factors and corporate governance attributes predict the credit ratings of financial and non-financial firms in Pakistan. The firm specific factors such as leverage, return on asset (profitability measure), firm size, Tobin's Q (growth opportunities measure), capital intensity and loss propensity is used, while corporate governance variables included; board size, block holder, shareholder rights, CEO duality and audit quality. The main findings of this study indicate that the firm specific variables such as firm size, return on asset and Tobin's Q are likely to increase credit ratings of firm and whereas, leverage has negative and significant effect on credit rating. Turning to governance variables, the results

shows that Board Size and CEO duality is positive and statistically significant with credit rating of firm while, block holders is negative but significantly associated with the firms' credit ratings. Thus the firms credit ratings in Pakistan are appear to be mainly predicted by size, profitability, growth opportunities, leverage, CEO duality, board size and number of block holders. This suggests that publicly available information in financial statement and corporate governance variables play a role in the evaluation of firms by the credit rating agencies. The governance mechanisms can mitigate probability of default by reducing the agency risk cost through better controlling the management activities and by extenuating the information asymmetry between the firm and creditors. Nevertheless, these are not the only elements on which the credit ratings of firms are assigned. In the second part, the results indicate that firm performance is positively affected by the credit rating of the firm; performance is measured by return on assets (ROA) and Tobin's Q. Firm with higher credit rating are signal to financial markets and facilities investors to take their financial decisions. Moreover, higher credit ratings indicate the management efficiencies and good quality of firm. The results further explain that size is positively related with ROA but in the line with Fama and French (1992) it has negative significant impact on Tobin's Q. Dividend per share and share price is positively and significantly associated with firm performance in all models. Leverage is negatively related with ROA whereas positively related with Tobin's Q. Loss propensity is negatively related with performance in both models. All governance variables significantly related with firm performance. Moreover, to test the impact of business conditions GDP (gross domestic product) is included in both models. The results show that GDP is positive but insignificant with firm value. This shows that GDP do not play an important role in predicting the firm performance in case of Pakistan.

In third part of the study investigates the impact of credit rating on stock return in Pakistan due to the information content of credit ratings. Various theories postulate that stock prices are greatly effect by credit rating assigned by rating agencies along, that is; higher credit rating reduces the default risk and cost of debt, hence; firm achieves higher return on their stock, moreover higher credit rating firm have good reputation in market. The study estimates four empirical models to test the impact of credit rating on stock return such as models with firm specific, governance, and macroeconomic variables. The results of all models shows that credit rating is positively and significantly affect the stock return in Pakistan, this indicates firms with higher credit ratings tends to have higher return on their stock. Furthermore, firm specific factors such as firm size, profitability, growth opportunities has positive and significant effect on stock return, while leverage and liquidity is negatively related with stock return. However, dividend per share is positive but insignificant, showing that high rated firms do pay dividend. In second model, the corporate governance variables (board size, block holders, CEO duality, audit quality, shareholder's

right) show insignificant relationship with stock return, this reveals that governance mechanisms is not substantial in predicting the stock returns in Pakistan. The third model of the study consists of ratings and macroeconomic variables, the empirical findings suggest that all macroeconomic variables (exchange rate, inflation, GDP) are highly significant with stock returns in Pakistan. This indicates that business conditions greatly affect the stock market performance in Pakistan.

This study increases to understand the importance of credit ratings and the firms which are listed in Karachi Stock Exchange rate their credibility on regular basis from PACRA and other rating agencies like JCR-VIS, as it improves the reputation, status and creditworthiness which eventually attract the potential investors. In case of Pakistan the regulatory authorities such as SECP (Securities and Exchange Commission of Pakistan) can consider to ask firms to give priority to credit rating. The State Bank of Pakistan has already made credit ratings mandatory for all banks and other financial institutions. The analysis of this study might facilitate debt holders, investors, shareholders and other stake holders rated by PACRA to understand the significance of credit ratings and its influence on performance and stock return of firms and also on financial decision of firms in Pakistan.

Appendices
APPENDIX A

Table A1

Descriptive statistics

Variables	Mean	S.D	Median
Firm characteristics			
Leverage	3.1758	0.429	2.5806
Profitability	9.7276	10.7621	7.7823
Size	4.5577	0.6878	4.5400
Capital intensity	0.3117	0.2745	0.2966
Tobin's Q	0.3191	0.2714	0.2377
Liquidity	3.9147	5.3710	1.2823
Dividend per Share	0.0051	0.0064	0.0013
Corporate Governance			
Board size	2.1011.	0.023	2.00
Business conditions			
Inflation(CPI)	13.36	4.094	13.40
GDP	3.9	1.152	4.3

Table A2

Correlations Matrix

A: Firm specific factors:

	CR	LEV	ROA	SIZE	TQ	C_I	T_S	LOSS	DPS	SP
CR	1									
LEV	-0.14	1								
ROA	0.15	-0.10	1							
SIZE	0.07	-0.07	0.02	1						
TQ	0.00	0.20	0.00	-0.40	1					
CAP_INT	-0.09	0.19	-0.05	0.18	0.09	1				
TYP_SEC	0.14	-0.17	-0.09	-0.16	-0.08	-0.55	1			
LOSS	-0.01	0.00	-0.09	-0.05	-0.04	-0.05	0.23	1		
DPS	0.10	0.02	0.00	0.03	0.09	0.04	-0.07	-0.04	1	
SP	0.12	-0.01	0.20	0.03	0.02	0.27	-0.43	-0.17	0.02	1

B: Corporate Governance Variables

	CR	DUAL	SHT	BS	BH	AQ
CR	1					
CEO Duality	0.23	1				
Shareholder's Right	0.07	0.15	1			
Board Size	0.16	0.01	-0.16	1		
Block holders	-0.15	-0.21	-0.04	-0.03	1	
Audit quality	0.06	0.04	0.36	0.22	0.09	1

C: Macroeconomic Variables

	CR	CPI	EXRATE	GDP
CR	1			
Inflation(CPI)	-0.02	1		
Exchange Rate	0.06	0.18	1	
GDP	-0.01	-0.60	-0.35	1

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