FACTORS EXPLAINING THE RELATIONSHIP BETWEEN CORPORATE CASH HOLDINGS AND CORPORATE GOVERNANCE: EVIDENCE FROM NON-FINANCIAL FIRMS OF PAKISTAN

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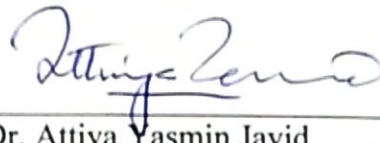**Pakistan Institute of Development Economics**

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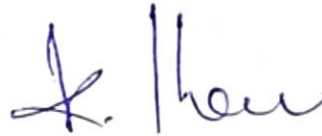
CERTIFICATE

This is to certify that this thesis entitled "**Factors Explaining the Relationship Between Corporate Cash Holdings and Corporate Governance: Evidence from Non-Financial Firms of Pakistan**" submitted by **Aamna Imtiaz** is accepted in its present form by the Department of Economics and Finance, Pakistan Institute of Development Economics (PIDE) Islamabad as satisfying the requirements for partial fulfillment of the Degree of Master of Philosophy in Economics and Finance.

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Cash and cash equivalents are deliberated as one of the most important component of current assets and are required to sustain the corporate financial management of any firm. A considerable part of the assets of the firms is held by the managers in form of cash and liquid securities for reinvestment in order to purchase the assets and to payout the dividends to shareholder and to backup cash for the company (Almeida et al, 2004). The pattern of the corporate cash holding is usually explained under trade-off model, pecking order theory and free cash flow theory. Corporate cash holding is very important in corporate finance. According to Mayer (1990), cash reserves are used for almost 75% of total net financing instead of equity, convertibles and debt. So we can say that understanding firm's cash policies is important in order to understand the financing decision of the firm.

In the previous twenty years, research has repeatedly recognized that a large portion of assets are being held in form of cash by the companies. More than $10 billion amount was held by Apple and Google Inc. in form of cash (Fresard, 2009). According to Wall Street Journal December 10, 2010 non-financial firms in the US were having $1.93 trillion in form of cash and other liquid assets at the end of year, 2010 increased from 1.8 trillion at the end of June, 2010, the Federal Reserve said. European Monetary Union (EMU) countries recorded total cash holdings above 300 billion Euros at the end of year 2000 (Ferreira & Vilela, 2004). The condition depicts serious doubts as why do companies hold ample of their assets in the form of cash and marketable

securities however these assets generate only minimal yield and are not valued by the stockholders (Faulkender & Wang; 2006).

Companies hold cash for different reasons such as precautionary motive and transactional motive, but at the same time holding excess cash balances is not always advantageous for the firm because it engages managers into agency conflicts and also results in yielding minimal returns on assets.

Although there are different motives for holding cash but precautionary motive is the most obvious one. It dates back to Keynes (1936) precautionary saving motive (1936) that cash fulfills the financing needs when the firm may not have enough reserves to invest or fulfill its commitments (Kim *et al*., 1998). Empirical evidence further supports this viewpoint; Opler *et al*. (1999) finds that businesses with riskier cash flows and meager access to funds hold further cash. According to Almeida *et al.* (2004) financially controlled companies invest in cash from cash flow, while unconstrained firms generally do not invest. Han and Qiu (2007) show that an upsurge in the instability of cash flow rises cash holdings for financially controlled companies while it does not have any effect on other firms. Bates *et al.* (2009) finds that firms' cash ratios have steadily increased since 1980 and this increase can be explained by precautionary savings motive.

Maximum of the prevailing literature on cash holdings is restricted to advance economies where the markets work under sophisticated regulatory environment. However, much less is known in emerging markets context. Scott (1995) explains the institutional factors that include cognitive, normative and regulative structures which affect company's monetary practices. According to Scott, one of such factors is the socio-economic factor that embraces laws and order outlooks which is reflected to be fragile in many developing marketplaces as compared to developed

markets like US (North, 1990, 2005). The situation raises the level of vagueness in dealings and subsequently results in a range of fruitless practices such as cash preservation. Moreover, dawdling institution progress may stimulate firms to implement traditional financial practices (North, 2005; Al-Najjar, 2013). In Pakistan financing constraints are significant issue because of its lower level of financial development and poor protection of investor interest. This situation worsen the moral hazard and adverse selection cost thus increase the firm's cost of raising money from outside (Rajan & Zingles, 1998). It implies that firms' investment policy in developing (developed) markets relies more (less) on the availability of internal funds. Thus, it can be concluded that cash holdings act as an important component of firm's financial strategy (Fresard, 2009).

In Pakistan's case, cash ratios are reasonably far above the ground alike those in advanced economies. Business insiders are thought to take necessary steps to make best use of the external stockholders' wealth, however, heaping up assets of the firm for not useful purpose is a hard approach to rationalize.

Holding of liquid assets like cash can be favorable or unfavorable for a firm. It offers elasticity to organization letting it to escape costs in case of loss in projects having positive-net present value because of deficiency of funds. While, cash holdings of the firms are likely to be used in ventures having downbeat net present value by managers. While talking about corporate governance structure of firms, prevailing indication on control proposes that the countries where rights of shareholder are comparatively fewer sheltered keep additional cash as compared to countries with good stakeholder security (Dittmar *et al.,* 2003). The cash holdings and firm value have weaker relationship in countries with low down stakeholder defense (Pinkowitz *et al.* (2006). The prevailing studies on United States and international companies have been

unsuccessful in providing indication that poor governance in the firm is associated to greater cash holdings. Harford (1999) and Opler *et al.*, (1999) come across insignificant association between cash holdings and corporate governance of the firm. Harford *et al.*, (2008) proposes that companies with meager governance hold fewer cash, but companies with great cash holdings, firms with poor governance employ cash rapidly. Kalcheva and Lins (2007) study countries of the worldwide sample and then they catch no substantial connection between governance of the firm and cash holdings.

1.2   Research Gap

The literature discussed has showed the relationship between corporate governance proxies and corporate cash holding in developed economies. However, present study investigates how corporate governance and firm specific variables impact cash holding in emerging markets like Pakistan.

1.3   Problem Statement

The cash holding of firms are not only affected by firm specific variables but corporate governance variables as well. So the corporate governance variables are included to investigate the impact in case of non-financial listed firms of Pakistan.

1.4   Objective of the study

The objective of the study is to throw lights on

- Impact of corporate governance variables and firm specific variables on the corporate cash holding of Non-financial firms of Pakistan listed on Pakistan Stock Exchange.

1.5   Plan of the Study

Thesis is structured as follow: Chapter 1 includes introduction, significance of the research, problem statement while in the chapter 2 theoretical background has been discussed. In chapter 3, the explanation of the exogenous variable is given along with the data and methodology. Chapter 4 includes the empirical results and discussion while chapter 5 consists of conclusion, limitation and recommendation.

CHAPTER 2

LITERATURE REVIEW

Cash and cash equivalents are the greatest liquid assets of any firm found inside the asset portion of a firm's balance sheet. The balance sheet displays the sum of cash and cash equivalents at a specified point in time, and the cash flow report describes the variation in cash and cash equivalents over time. Cash equivalents are the assets that are changeable into cash, such as money market holdings, short-term government bonds or treasury bills, marketable securities and commercial paper. Cash equivalents are eminent from other funds through their short term life; they mature within 3 months whereas short-term investments are 12 months and another important condition a cash equivalent needs to satisfy is that the investment should have insignificant risk of change in value.

In friction less domain of Miller and Modigliani (1958), no optimum cash levels are present and companies can generate funds whenever internal funds are not enough for everyday operations and for financing the project having positive Net Present Value (NPV). In these situations, firms are not projected to keep cash as stockholder wealth is not created by these holdings. UK and European firms mostly hold reasonable amount in form of cash on their balance sheets, however this is against the predictions of perfect capital market, literature says. (e.g. Kim *et al*., 1998; Opler *et al.*, 1999; Dittmar *et al.*, 2003; Ferreira & Villela, 2004). In reality there are many market limitations like transaction costs and information asymmetries which lead firms to hold cash. The ideal level of cash holdings is determined by one of the two key theories: The Trade Theory and Pecking Order Theory.

The tradeoff theory describes that optimum level of cash is an interchange of the costs and paybacks of holding cash. Paybacks of holding cash on balance sheet embrace its part as a protection for sidestepping situations where a firm has to approach the financial markets in order to float funds, or discharge current assets for funding its development prospects. Cash holdings also lessen the possibility of monetary suffering and provide opportunity for investment in situations where few financial limitations are obligatory. The most important cost of holding cash is the opportunity cost of the capital invested in liquid assets (Ferreira & Vilela, 2004). Pecking order theory explains that a company's capital structure is a direct result of its viability, venture needs and payment policy (Myers & Majluf, 1984). It refer to that when operative cash flows are high, they are used by companies to fund new gainful projects, to pay back debts, to payout dividends and to mount up cash. Myers and Majluf (1984) ruminate that no optimal level of cash and cash has the part of a shield between retained earnings and venture needs.

The pecking theory refers to putting money into pyramid which decreases the cost related to outside financing due to information asymmetries and signaling problems. Financing hierarchy explains that when retained earnings are deficient to finance a new investment, a company first depends on the cash holdings before issuing new debt. When the firm is unable to issue new debt then it issues securities. This can result in low investment issues due to the possibility that a positive Net Present Value project will be passed instead of issuing securities (Myers, 1977). Even though the tradeoff theory and pecking order theory are considered as contradictory theories as compared to each other, the difference between the two is not accurate. The predictable association of cash holding with its determining factors is uncertain (Opler *et al.*, 1999).

Now the third theory which explains cash holdings is agency theory of Jensen (1986). It proposes that entrenched managers of companies having restricted investment opportunities are more responsible to hold cash instead of paying it to stockholders. The agency theory defines two hypotheses, the free cash flow hypothesis and the risk reduction hypothesis in describing corporate cash holdings:. These are reviewed here:

2.1 The Free Cash Flow Hypothesis

Cash holdings are regarded as free cash flows under the free cash flow hypothesis as they can be utilized by managers to oblige for their own benefits at the cost of shareholders. Managers hold large quantity of money since they are risk opposed (Fama & Jensen, 1983).. Managers are not completely stretched out in light of the fact that they can't isolate their human capital; consequently more entrenched managers hold overabundance money to maintain a strategic distance from showcase teach. It is additionally contended that within the sight of managerial discretion, managers have spurs to hold a lot of money so they can have greater adaptability to seek after their own particular interests (Jensen, 1986; Drobetz *et al.,* 2007). Lins and Kalcheva (2006) find that when the management is entrenched and/or the investors are not well-protected, cash holdings have an incremental negative effect on firm value.

2.2 Risk Reduction Hypothesis

According to principle of finance, managers are required to maximize the wealth of their respective firms by making wise and practical decisions for financing and further investment. Corporate cash holdings is regarded as risk-free investment; a manager who is risk averse may avoid uncertain positive net present value (NPV) project. This type of risk reduction is typical agency problem and is not beneficial for shareholders (Tong, 2008).

Liu and Mauer (2011) examine how CEO compensation incentives influence cash holdings from two standpoints: pay-for-performance incentives and risk taking incentives. Their results exhibited a significantly positive relationship between CEO's payment and corporate cash holdings. The result suggests that greater CEO risk-taking spurs boost greater liquidity. This result is inconsistent with Tong (2010) where cash is deliberated a less risky investment. They explain this finding from bondholder's point of view and costly external financing. When risk incentive increases bondholders want higher cash reserves as cushion. Furthermore, when firms are higher risk takers, they are expected to bear financial restrictions and therefore build excess cash holdings to hedge the risk. The authors find no incentive between pay-performance incentives and cash holdings.

Ganor (2011) studied the cash hoarding behavior of managers during great recession of 2008. Results of the study showed that subsequent to great recession managerial reward showed the positive correlation with the level of corporate cash holdings. It proposes that agency costs results in cash retention during financial distress. Authors explicates that high managerial payment encourages the mangers to be risk averse affecting the decision of the managers to retain cash. This is because at the time of financial crisis, when it is difficult for the managers to catch similar job and the chance of far-reaching failure rises, cash hoarding exercise of managers is not at optimal level and comes at the cost of stockholder value.

Cost of holding cash is particularly high when the firm-or country-level corporate governance mechanisms do not offer sufficient protection to minority shareholders. Dittmar and Martha Smith (2007) studied the reasons of managerial entrenchment and lack of shareholder oversight influencing both the value and usage of cash. Result of the study showed that cash policy of the firm is affected by the governance. In case of badly governed firms, the market value of surplus

cash reserves is decreased by up to one-half. It was also found that firms with meager corporate governance do not utilize the excess cash efficiently and quickly than those with good governance. Excess cash reserves are being invested by firms with poor governance in projects having low accounting returns. However, if the firms are complying to corporate governance regulations then the negative influence of excess cash investment is reduced. Pinkowitz *et al.* (2006) investigates the agency theory perspective of cash holdings in a cross country study. Results showed that the value of corporate cash holdings is not as much in countries with poor investor security because of the greater aptitude of controlling stockholders to extract private paybacks from cash holdings in such countries.

Hanford *et al*., (2008) studied the governance structures for US firms. Their results showed that firms with weaker corporate governance have smaller cash reserves. These results are different from the results of other international studies. This is because governance practices are different in US than in other countries. The US scores very on investor rights and govern of law files, demonstrating that it has both high legitimate security of investor rights and solid implementation of those rights. This infers in such setting even entrenched managers are not as settled in as their associates in nations with less legitimate protection of minority investors. Together, these findings suggest that the costs of holding cash is particularly high when the firm- or country-level corporate governance mechanisms do not offer sufficient protection to minority shareholders.

There are three hypotheses that throw light on how corporate governance is important in formulating the cash policy of the firms according to Harford et al. (2008) and Kuan, Li, and Chu (2011). According to these researchers, family and non-family firms have shown different results when the influence of ownership of managers and independence of board was checked.

According to Flexibility hypothesis, to exploit unforeseen investment prospects, the management of the firm holds a substantial and greater sum of cash. However, the Spending hypothesis in conflict with aforementioned hypotheses proposes a little level of cash holding. It considers agency cost to be an important determinant. According to this hypothesis, the entrenched managers consider spending better than holding cash in bigger amount (Harford, 2008 and Kuan *et al*., 2011). Shareholding hypothesis proposes that companies with shareholder having majority hold huge amount of cash for stockholders wealth expansion.

The agency theory of (Jensen & Meckling, 1976; Fama & Jensen, 1983) states that CEO duality, i.e. the title role of CEO is joined with the chairman of the board indicates a dearth of split-up between the management and controlling power decisions. It is maintained that CEO duality could lessen board independence and its capability to excellently observe managers as well as the release of information to external investors. Gul and Leung (2004, p. 356) put forward that companies with CEO duality are mostly linked to lower levels of deliberated disclosures since the board is more averse to be viable in observing administration and guaranteeing a more elevated amount of transparency.

Previous research studying the relationship between CEO duality and disclosure level has found varied proof. Gul and Leung (2004) discover that CEO duality is linked with a lesser voluntary disclosure in case of Hong-Kong however, Cheng and Courtenay (2006) have not reported any substantial link between CEO duality and the magnitude of voluntary disclosure in case of Singapore.

We manage to compile data on firm-level corporate governance mechanisms such as Board size, CEO-Chairman duality, audit committee size and other control variables. Our main aim is to

provide insights on whether the board and ownership variables could predict the cash balances held by publicly listed firms in Pakistan.

Chapter 3

DATA AND METHODOLOGY

3.1 Methodology

3.1.1 Specification of the Model

To measure the impact of corporate governance on corporate cash holding, we used Ozkan & Ozkan (2004) model. A statistical model is designed based upon aforementioned Model to quantitatively investigate the effect of independent variables on cash holdings of firms. This model is shown as below:

$$CASH_{i,t} = \alpha + \beta_1 CEOD_{it} + \beta_2 AUDC_{it} + \beta_3 BDS_{it} + \beta_4 NWC_{it} + \beta_5 LEV_{it} + \beta_6 MTB_{it} + \beta_7 SIZE_{it} + \beta_8 DIV_{it} + \varepsilon_{it}$$

In the above model the cash holdings of the firm "i" at time "t" is the dependent variable and the independent variables are Board size (*BDS*), CEO-Chairman Duality (*CEOD)* and Audit Committee size (*AUDC)*, and a set of control variables (i.e. size, dividend, leverage, net working capital and market to book ratio) where "ε" is the error term. "α" is the intercept showing the cash holdings of firm "i" at time t = 0,.

3.2 Econometric Methodology

3.2.1 Types of Panel Models

There are various types of panel data estimation techniques like pooled OLS, Between Estimator, Within Estimator, Feasible Generalized Least Square (FGLS), Panel Corrected standard error

(PCSE), fixed effect model, Random effect model and Generalized Method of Moments (GMM) etc.

3.2.2 The Pooled OLS

In panel methodology, one type is constant coefficients in both intercepts and slope. We just pool the data and run the OLS, there is no significant cross-sectional effect and no time effect. This model sometimes is called constant coefficient model.

3.2.3 Fixed Effect Model

Fixed effect methodology has constant slope but intercept vary across the cross section, over the time or both. In this type of model there is no significant time effect, there is significant cross-sectional effect like country effect. This model is called fixed effect model.

$$CASH_{i,t} = \alpha_i + \beta_1 CEOD_{it} + \beta_2 AUDC_{it} + \beta_3 BDS_{it} + \beta_4 NWC_{it} + \beta_5 LEV_{it} + \beta_6 MTB_{it} + \beta_7 SIZE_{it} + \beta_8 DIV_{it} + \varepsilon_{it}$$

The subscript i with intercept shows that the intercept varies across the cross section, in this study 100 cross sectional firms of Pakistan are taken under consideration.

In fixed effect model, slope is constant and intercepts vary over the time. In such type of model there is no significant group effect. The error term of this model may auto correlate with its time lagged effect.

$$CASH_{i,t} = \alpha + \beta_1 CEOD_{it} + \beta_2 AUDC_{it} + \beta_3 BDS_{it} + \beta_4 NWC_{it} + \beta_5 LEV_{it} + \beta_6 MTB_{it} + \beta_7 SIZE_{it} + \beta_8 DIV_{it} + \varepsilon_{it}$$

3.2.4 The Random Effect Model

According to the WH. Greene (2001) the random effect model is a regression with random constant term.

$$CASH_{i,t} = \alpha + \beta_1 CEOD_{it} + \beta_2 AUDC_{it} + \beta_3 BDS_{it} + \beta_4 NWC_{it} + \beta_5 LEV_{it} + \beta_6 MTB_{it} + \beta_7 SIZE_{it} + \beta_8$$

$$DIV_{it} + \varepsilon_{it}$$

Where

$\dot{\omega}it = \varepsilon i + Uit$

We assume α_1 is random with mean value of α_1, instead of treating $\beta\alpha_1 i$ as a fixed and intercept of each group as a

$\alpha_1 i = \alpha_1 + \varepsilon i$

Where

εi = random error with zero mean and variance $\sigma\varepsilon$

3.2.5 Estimation Technique

In economics, there are three types of data, panel data, time series data and cross-sectional data. The panel data is the mixtures of time series and cross-sectional data. The study moves towards panel data for many reasons. The first and very important reason of using panel data is that we can capture and remove the heterogeneity and autocorrelation between the exogenous variable. The Second reason is that panel data can solve the problem of cross sectional regression and

investigation. Third reason is that panel data can be used to compare the position of each country in one regression.

There are two main types of panel data. Micro panel data and Macro panel data. Micro panel data means when time series is less than the cross sections and when the time series is greater than cross section it is called Macro panel data. Most of the economists viewed that when time series will be more than fifteen years it could be macro panel data. Both data sets have different methodologies, different estimation technique, different explanation and different problems. The methodologies of micro panel data sets are fixed effect, random effect and panel OLS while the methodology of macro panel data are Pedroni cointegration, panel VECM, Panel GMM, Dynamic panel OLS. This study used Panel unit root, fixed effect, random effect and Hausman test because the study has used the micro panel data. This study takes the assumption that all independent variables are exogenous, so study cannot estimate Panel GMM. The natural start of integration is to check the unit root or stationary of the data set.

We compared Common Effect Model with Fixed Effect Model and results supported Fixed Effect Model. Fixed effect model is compared with Random Effect Model by using Hausman Test and Fixed Effect model is found suitable as the value of the Hausman test statistic is significant and lesser than 0.05.

3.2.6 Fixed Effect Method

The effects which are individually unobserved are allowed by fixed effect. These unnoticed fixed effects are linked with incorporated variables. The rationale behind fixed effect model is that something within the individual may affect the dependent variable and it is need to control for this. Fixed effect method removes or controls those time invariant characteristics and therefore it can consider the net effect of the predictors on the dependent variable. Another

important assumption regarding fixed effect method is that those time-invariant characteristics are unique in treatment to the individual and cannot be treated with other individual characteristics. As every entity is unique so the error term and the constant cannot be correlated with each other.

General equation for fixed method is specified as

$$Y_{it} = \alpha_i + \beta 1 X_{it} + \mu_{it}$$

Where

Yit = Dependent variable while i= is entity and t=is time

β1 = Coefficient of independent variable

Xit = One independent variable

αi = (i=1……n) unknown intercept for each cross-section

3.2.7 Random Effect Method

If characteristics of fixed effect model are not fulfilled the random effect model is used as an alternate. The assumption behind this model is that, unlike FE model, the variation in cross-section is assumed to be random rather than fixed and uncorrelated with independent variables included within the model. If someone has believed that differences between cross-sections have some influence on dependent variable than random effect method should be use. The main advantage of using random effect model is that it includes time variant variables i.e. working age and employment rate etc.

The random effect model can be specified as

$$Y_{it} = \alpha + \beta X_{it} + \mu_{it} + \varepsilon_{it}$$

Where uit is error between the cross-sections while εit is the error within the cross-section

3.2.8 Hausman Test

Hausman test is used to decide that which model is best for estimation either fixed effect model or random effect model are considered with saving model and growth model for all sample countries, South Asian countries and East Asian countries. The null hypothesis and alternative hypothesis for this test is given below

Ho: Random effect model is consistent and efficient

Ha: Random effect model is not consistent and efficient

Chi square distribution value is followed by Hausman test and statistic tests are estimated by using the formula given below

$$H = (\Omega_{FE} - \Omega_{RE})'[Var(\Omega_{FE}) - Var(\Omega_{RE})] - 1(\Omega_{FE} + \Omega_{RE}) \sim \chi 2$$

Here Ω indicates a slope coefficient vector. Statistic value of Hausman test will be significant if there is large difference between parameters estimated by random effect model and fixed effect model. In the case when Hausman test statistics are large (greater than 0.05) than it implies the rejection of null hypothesis. If value is less than 0.05, it means rejection of alternative hypothesis.

Hausman test recommends that fixed effect method is suitable for model for all cases as its value is less than 0.05 and we reject H0 while accept H1.

3.3 Data

100 Pakistani Non-financial firms listed at Pakistan Stock Exchange (PSX) over the period of 2010-2016 are included in the sample. Financial firms are not incorporated in the sample due to the reason that determinants of their cash requirements are not the same as that of non-financial firms. Data is collected from the annual report of these firms and further the data is collected from the publications of the State Bank of Pakistan (SBP).

3.4 Measurement of Variables

Corporate cash holding is the main variable of interest. The ratio of cash and cash equivalents to total assets is represented as a company's corporate cash holding. Variation in cash holding is shown by controlling for five variables. The logarithm of total assets is taken as firm size. While the Market-to-book i.e. the ratio of the product of number of shares held by the company and price of share to total assets is taken as an alternative for investment opportunities. Dividend is taken as dummy variable which is represented as 1 if firms pay dividend and if they do not pay any dividend then it is taken as 0. The ratio of total debt to total assets is given as Leverage. The ratio of current assets minus current liabilities to total assets is termed as net working capital that is taken as proxy of liquid asset substitute.

The number of directors on the board represents Board size. While a dummy variable that is CEO-Chairman duality spots firms in which the Board's chairman and the Chief Executive Officer are the same one. Number of directors in the audit committee represents audit committee size.

Table 3.1 Name and Measurement of Variables

Name of the Variable	Denoted by	Definition
Cash and Cash Equivalents	*CASH*	Ratio of cash and cash equivalents to total assets
Board Size	*BDS*	Total number of directors in the Board

Audit Committee Size	AUDC	Number of members in Audit Committee
CEO-Chairman Duality	CEOD	Dummy variable which takes the value of 1 for firms that do not have same person as CEO and Chairman and 0 otherwise
Size	SIZE	Natural logarithm of total assets
Investment Opportunities	MTB	The ratio of the product of no. of shares held by the company and price of share to total assets) is taken as a proxy for investment opportunities.
Dividend Payments	DIV	Dummy variable which takes the value of 1 for firms that pay dividend and 0 otherwise
Leverage	LEV	Ratio of total debt to total assets
Liquid Asset Substitute/Net Working Capital	NWC	Ratio of current assets minus current liabilities to total assets

Chapter 4

EMPIRICAL RESULTS AND DISCUSSIONS

This chapter discusses the empirical results in two parts, one by examining cash holding determinants of non-financial firms using panel data while the other part explains the relationship between corporate cash holding and corporate governance.

4.1 Summary Statistics

The summary statistics of all variables used in the research for 100 non-financial firms, data from 2010-2016, observations, mean, standard deviation, maximum and minimum are calculated and the results obtained are mentioned in table 4.1.

Table 4.1: Summary Statistics of Non-Financial Firms of Pakistan (Cash Holding)

Variable	Observation	Mean	Std. dev	Min	Max
CASH	700	0.16007	.0501913	.02915412	.1522821
BDS	700	7.681754	1.211018	6	13
AUDC	700	3.294201	.6461985	0	6
CEOD	700	.6619519	.4733799	0	1
MTB	700	.6998838	4.12152	-6.613939	83.55749
SIZE	700	22.0809	1.5091	15.78336	25.49588
NWC	700	.0558839	1.126374	-8.002661	17.28958
LEV	700	.5317508	2.656583	-.2264346	55.12849
DIV	700	.5289958	.4995119	0	1

The cash or cash equivalence measures (Cash Holding) shows Pakistani non-financial firms has achieved on average high cash holding level over the seven years i.e. 2010-16. In case of total

sample, the mean of Cash is 16 % having a maximum of 15% while a minimum of -0.02%. Regarding the standard deviation, it means that the values of Cash diverge from mean to mutually sides by 5.1 percent indicating small variation from the mean.

On the other side for Leverage and dividend, the mean value 53% and 52% respectively with a maximum value and with a minimum value 55.1% and 12% as well as for dividend 0 and 1. The standard deviation (SD) for the above series is 49% which shows high variation from mean.

4.2 Correlation Matrix for factors explaining the association between Corporate Cash Holdings and Corporate Governance:

To check the existence of multicollinearity in model shows correlations among independent variables which introduce a problem because the estimates of parameters becomes inefficient and shows large standard errors. The results then make the coefficient values and signs unreliable. In addition, multiple independent variables with high correlation add no additional information to the model. It also conceals the real impact of each variable on the dependent variable Anderson *et al.*, 2008). Further it is argued that correlation coefficient below 0.9 may not cause serious multicollinearity problem (Hair et al., 2006). In addition, (Malhotra, 2007) has stated that multicollinearity problems exists when the correlation coefficient among variables is greater than 0.75.

Table 4.2: Correlation Matrix of Variables

	CASH	BDS	AUDC	CEOD	MTB	SIZE	NWC	LEV	DIV
CASH	1								
BDS	0.7427	1							
AUDC	0.7177	0.7006	1						
CEOD	0.2724	0.32784	-0.050	1					
MTB	0.40575	0.575489	0.1773	0.592963	1				
SIZE	0.05386	-0.11655	0.3115	-0.69628	-0.42269	1			
NWC	0.16766	0.275172	0.0918	0.225359	0.359948	-0.19292	1		
LEV	0.4699	0.553154	0.0977	0.664591	0.681576	-0.46061	0.17213	1	
DIV	-0.3432	-0.21262	-0.479	0.428677	0.521675	-0.72478	0.18928	0.554575	1

(Correlation matrix variables results have been obtained using Stata statistical software).

Thus, Correlation of each variable with itself gives the value of 1. The higher values indicate higher correlation the lower value specifies lower correlation.

## 4.3 Test of heterogeneity cross section (For Non - financial firms of Pakistan)
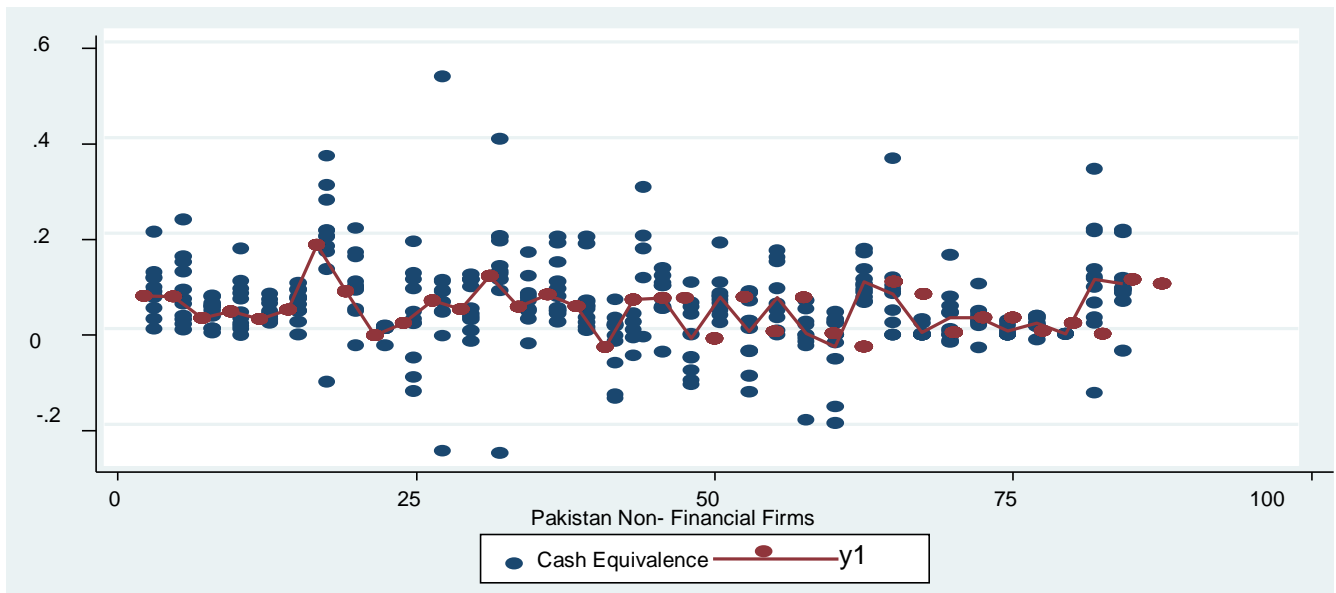
4.3 Graph shows Heterogeneity (Cross section for 100 Non- Financial firms in Pakistan)

Above graph is presenting cross sectional heterogeneity analysis over the group (cross sections). Up and down movement of red line shows that there exist cross sectional heterogeneity but at minor level.

Therefore the methodology of this study is based on fixed effect methodology with assumption that there exist cross sectional heterogeneity and we do not want to calculate cross sectional heterogeneity. If red line is straight then there is no cross sectional heterogeneity. So as a result on average every non-financial firm is different from each other at minor level.

4.4 Test of heterogeneity Over Time (Non-financial firms of Pakistan)

Now, cross sectional heterogeneity is checked over the time period. There is possibility that every non-financial firm may differ over the time. Below tables shows us cross sectional heterogeneity from 2010-2016.
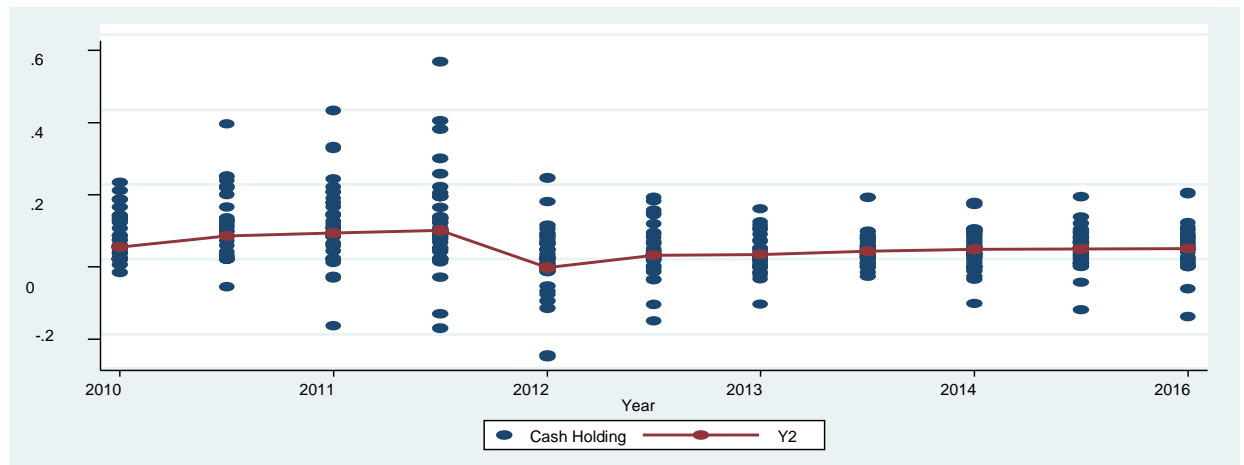
4.4 Graph shows Heterogeneity (Over Time Period for Non-financial firms of Pakistan from 2010-2016)

The above graph shows that on average mean value of cash holding from track at year 2011, 2012 and 2013, which shows that there exists heterogeneity at years 2011, 2012 and 2013.

4.5 Panel Unit Root Tests

In panel unit root two dissimilar types are applied. First are Levin and Lin (LL) test and second Im Pesaran and Shin test (2003). Levin and Lin (LL) assume common effect while Im Pesaran and Shin (IPS) assume individual unit root process, across cross sections. In both test null hypothesis are data has unit root or non-stationary and alternative is data has no unit root or stationarity exist. This study used Levin and Lin (LL) because we assumed common effect across cross section.

The hypotheses of this equation are

Ho: $\beta = 0$

H1: $\beta < 0$

If the P value is less than 0.05 then reject the null hypothesis or variable have stationary and if P value is greater than 0.05 then we accept the null hypothesis means variable has unit root. The results show that variables have no unit root (stationary) because probability values are less than 0.05. The result is similar with Song, et al. (2008), Dnida (2006), Zaman, et al. (2011) and Ahmed, et al. (2013).

Table 4.5: Panel Unit Root Test

Variable	Statistic	Probability
Audit Committee	-3.02188	0.0013
Board Size	-1.77466	0.0380
Cash and cash equivalent	-35.1676	0.0000
Leverage	-49.3235	0.0000
MTB	-22.7517	0.0000
NWC	-68.3530	0.0000
Size	-14.6095	0.0000

Table 4.6: Results of factors explaining the relationship between corporate cash holding and corporate governance of non-financial firms of Pakistan by Fixed Effect Model

	Coefficient	Standard Error	t-statistic	P value
Constant	2.908819*	0.349197959	8.33	(0.000)
BDS	.015955**	0.006818376	2.34	(0.018)
AUDC	-.0074484 ***	0.003027805	-2.46	(0.004)
CEOD	.0262826**	0.008213313	3.20	(0.023)
MTB	.0139857***	0.005030827	2.78	(0.046)

SIZE	.1344884*	0.015840801	8.49	(0.000)
NWC	.0069893**	0.002435296	2.87	(0.038)
LEV	.0595864 *	0.012413833	4.80	(0.000)
DIV	.0062081***	0.002710961	2.29	(0.037)

Note: *** (**) (*) denotes statistical significance at 10% (5percent) and 1% level and without any "*" is insignificant at 1%, 5% and 10%.

The results are derived through Stata statistical software; first of all we checked the nature of the data, several diagnostic checks for normality of the data, linearity of the data, multi-collinearity, cross section dependency, serial correlation as well as heteroskedasticity. After that we checked the data for heterogeneity cross section and over the time period. Before estimation, we checked various techniques like pooled OLS, between estimators, within estimator, Feasible generalized least square, panel corrected standard errors, random effect and fixed effect. We found from the results that random effect and fixed effect results gives us more consistent result. Therefore, we used these techniques. To select between random effect and fixed effect, we applied Hausman test which shows that fixed effect is better to be used. As the Hausman value is 0.001 which is less than 0.05, therefore we rejected the null hypothesis that fixed effect is not appropriate while random effect is suitable to apply.

The results of the fixed effect show us that corporate governance variables CEO duality, Audit committee and Board size show strongly significant results. The relationship of number of directors on the Board and Corporate cash holding of the firms is positive and significant at 5% level of significance showing that If the size of the Board is large then it impacts the corporate cash holdings in a positive manner and this also shows that now in Pakistan in this context Corporate Governance is making an impact. This result is consistent with Yuanto Kusnadi (2003) findings which indicate positive and significant relationship between these two variables for Singapore's listed firms. Securities and Exchange Commission of Pakistan

is our country is keeping a strict eye on the firms in this regard as there is minimum numbers of directors' requirement to complete and constitute the Board. However, size of Audit Committee is showing significant but negative relationship with cash holdings. The result depicts that an effective audit committee having reasonable number of members in it does not let firms hold more cash and there is better check and balance in the firms. The third corporate governance variable i.e. Chairman-CEO duality has a positive and significant relationship with corporate cash holding showing that the composition of Board impacts the level of cash holdings and plays an important role in cash management. Others variables that are leverage, size, networking capital, investment opportunities and dividend payments also shows significant and positive results.

Results of the relationship of size of firm with cash holding show consistency with study of Afza and Adnan (2011). However, the result is not consistent with the finding of the study of Jensen (1986) and Dittmar et al. (2003). The result of leverage in this study is consistent with result of Oplers et al. (1999) who found positive and significant relation between the two. NWC of the firms showed positive and significant relationship with cash holding and the result is consistent with the study of Zia-ul-Hannan and Asghar (2013) and also with the Kafayat et al. (2014). The result of Dividend payment is showing positive and significant result verifying the findings of study of Masood and Shah (2014) in this context. The finding of investment opportunities or Market to book ratio is partially consistent with results of Ozkan and Ozkan (2004) and Oplers et al. (1999), the reason for being partially consistent is that this study is showing significant relationship while these studies showed insignificant but positive relationships between the aforementioned variables.

After estimating FE model, we also run random model which handles constant not fixed, but a random as parameters. The results of Random Effect regressions are depicted in Table below.

Table 4.7: Results of factors explaining the relationship between corporate cash holding and corporate governance of non-financial firms of Pakistan by Random Effect Model

	Coefficient	Standard Error	T-statistic
Constant	-.1390326	.2235775	-0.62185
BDS	-.0129983	.0121415	-1.07057
AUDC	-.0128379	.01352	-0.94955
CEOD	.0329709	.0146198	2.255222
MTB	.0117259	.0076624	1.530317
SIZE	.0114401	.009841	1.162494
NWC	.0005781	.0056123	0.103006
LEV	.0080174	.0118737	0.675223

Note: *** (**) (*) denotes statistical significance at the 10% (5%) and 1% level and without any "*" is insignificant at 1%, 5% and 10%.

It can be seen in the above table that most of the determinants are showing expected and significant coefficients in line of economic theory.

After estimating equation with random effects, the Hausman test is applied to choose the most appropriate method comparing the fixed effect and random effect estimators. The following Hypothesis are tested,

H_0: FEM is the most appropriate model

H_A: REM is the most appropriate model

The results of the tests are reported in below table and it can be seen in this case that Probability value is less than 0.05 so we accept hull hypothesis. So according to Probability and chi-sq. statistic the most appropriate model in static panel estimation is the fixed effect model.

Table 4.8: Correlated Fix Effects- Hausman test

Test Summary	Chi-sq. statistic	df	Prob.
Cross section random	21.78	3	0.0028

4.6 Redundant Fix Effect Test

In order to check the validity of the model, standard F test is applied to test the null hypothesis that all the constants are same (homogenous) against the alternative hypothesis that there is no common constant across the cross section implying heterogeneity across the cross sections. Since the F test rejects the common constant for each cross section, so we use the FE method which allows a different constant for each group

Table 4.9: Redundant Fixed Effects Test

Effect Test	Statistic	d.f	Prob.
Cross Section F	1.204	(35, 193)	0.2145

Chapter 5

CONCLUSION, LIMITATION AND RECOMMENDATION

5.1 Conclusion

The study is conducted to find what kind of relationship exists between corporate cash holding and corporate governance; evidence from the non-financial firms of Pakistan. The motivation for conducting this study was to study the determinants of cash holdings of non-financial companies in Pakistan. The objective is accomplished by explaining the data and running specifications of panel least squares regressions for Pakistan.

Corporate Governance Variables are showing a very important and significant impact on the dependent variable i.e. corporate cash holding. Two variables that are Board size and Chairman-CEO Duality are showing positive relationship however contrary to it audit committee size showed negative relationship. Very less work has been done in Pakistan on impact of Size of Audit Committee on Corporate Cash Holding however the variable is important because an effective and independent Audit committee looks into the financial reporting process of the firm and tells the shareholders that whether the company is complying with the laws of accounting or not. Control variables in this study are showing positive and significant relationship with cash holding.

Managers most of time try to influence the decisions pertaining to cash holdings of the firms but in presence of Powerful and independent Board and Audit committee and complying with the Corporate Governance Rule can serve better in the interest of shareholder and investors and save the company/firm from financial bankruptcy.

5.2 Recommendation

For comprehensive understanding regarding relationship among cash holding and corporate governance of non-financial firms in Pakistan, future researchers should include all financial firms and non-financial firms of Pakistan. The study designates that marketplace conditions and stockholder security affects cash holdings in a indistinguishable manner and showing that there is a need of theory that gives right directions to the firms to hold reasonable amount of cash. There are more variables specific to the firm that can be studied in future as they have not been studied in this thesis. An accumulation of such variables can display an outline for further analysis of corporate cash holdings.

5.3 Future Prospects of the Study

- This study is conducted considering factors showing link between corporate cash holding and corporate governance for non-financial companies in Pakistan, advanced research can be conducted for financial firms.
- Only few corporate governance variables were incorporated to see the relationship, numerous macroeconomic variables impact cash holding of firms studied.
- Future researchers can also study on qualitative variable to capture the comprehensive impact of cash holding and corporate governance.
- Future researcher can study factors explain the relationship between cash holding and corporate governance before 2008 crises and after 2008 crisis till dated.

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Appendix

Panel GMM

Dependent Variable: CASHANDCASHEQUIVALENT
Method: Panel Generalized Method of Moments
Sample: 2010 2016
Periods included: 7
Cross-sections included: 100
Total panel (unbalanced) observations: 613
2SLS instrument weighting matrix
Instrument specification: C BOARDSIXE AUDITCOMMETTI LEVERAGE MTB
    NWC SIZE
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEVERAGE	0.046629	0.012504	3.729267	0.0002
MTB	-0.006787	0.007956	-0.853016	0.3941
NWC	-0.006358	0.007193	-0.883944	0.3771
SIZE	0.115712	0.014676	0.884603	0.2000
BOARDSIXE	-0.016927	0.009471	-1.787238	0.0745
AUDITCOMMETTI	0.002928	0.014475	0.202250	0.8398
C	-2.451754	0.331063	-7.405699	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.639410	Mean dependent var	0.004020
Adjusted R-squared	0.564732	S.D. dependent var	0.177422
S.E. of regression	0.117054	Sum squared resid	6.946724
Durbin-Watson stat	0.705324	J-statistic	4.19E-16
Instrument rank	106		

UNIT ROOT

Variable	Statistic	Probability
Auditcommittee	-3.02188	0.0013
Boardsize	-1.77466	0.0380
Cash and cash equivalent	-35.1676	0.0000
Leverage	-49.3235	0.0000
Mtb	-22.7517	0.0000
Nwc	-68.3530	0.0000
Size	-14.6095	0.0000

FIXED EFFECT

	Coefficient	Standard Error	T-statistic	P value
Constant	2.908819*	0.349197959	8.33	(0.000)
BDS	.015955**	0.006818376	2.34	(0.018)
AUDC	-.0074484 ***	0.003027805	-2.46	(0.004)
CEOD	.0262826**	0.008213313	3.20	(0.023)
MTB	.0139857***	0.005030827	2.78	(0.046)
SIZE	.1344884*	0.015840801	8.49	(0.000)
NWC	.0069893**	0.002435296	2.87	(0.038)
LEV	.0595864 *	0.012413833	4.80	(0.000)
DIV	.0062081***	0.002710961	2.29	(0.037)

RANDOM EFFECT

Variable	Coefficient	Standard Error	T-statistic
Constant	-.1390326	.2235775	-0.62185
BDS	-.0129983	.0121415	-1.07057
AUDC	-.0128379	.01352	-0.94955
CEOD	.0329709	.0146198	2.255222
MTB	.0117259	.0076624	1.530317
SIZE	.0114401	.009841	1.162494
NWC	.0005781	.0056123	0.103006
LEV	.0080174	.0118737	0.675223

HAUSMAN TEST

Table Correlated Fix Effects- Hausman test

Test Summary	Chi-sq. statistic	df	Prob.
Cross section random	21.78	3	0.0028