THE IMPACT OF CORPORATE GOVERNANCE ON CASH HOLDINGS: A COMPARATIVE STUDY OF THE MANUFACTURING AND SERVICE INDUSTRY

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Abstract

In this study, a comparative analysis of manufacturing and services industry is conducted to test the relationship between corporate governance and cash holdings of non-financial listed firms in Pakistan. Several proxies for corporate governance were used, such as the institutional ownership, directors' ownership, ownership concentration, board size and board independence. To avoid omitted-variable bias in explaining cash holdings of these firms, seven control variables were also included namely growth, dividend, size, leverage, capital expenditures, net-working capital and cash flows. The study reveal that for manufacturing firms the growth is found to be positively related with cash holdings, while size of firm, leverage and networking capital are negatively related with the cash holdings. On the other side, for servicing firms, board independence and dividend are directly related to cash holdings while leverage and net-working capital are negatively related to cash holdings by these firms. However, most of the proxies are found to be insignificant, which is an indication of weak corporate governance in Pakistan in determining the cash holding decision.

Keywords: Board of Directors, Ownership Structure, Ownership Concentration, Non-financial firms, Karachi Stock Exchange

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JEL Classification: G29, G38, O16

1. Introduction

Holding adequate cash is one the most important art adopted by modern organization to provide operational liquidity and also to capitalize on good investment opportunities. Cash holding is "the cash in hand or readily available for investment in physical assets and to distribute to investors" (Shah, 2012). Generally, firms hold cash for various motives such as to meet operational needs of the business or unanticipated cash demands that require additional amount to be kept for a firm's safety (Damodaran, 2005). However it is noticed that the motives for holding cash in Manufacturing Sector differ from Services Sector. This is because of the idiosyncratic factors which are peculiar to individual firms such as research and development (R & D) intensity, organizational expenditure rate, etc. affect cash ratio differently in these sectors (Sánchez & Yurdagul, 2013). Typically it is seen that firms in the Services Sector are more inclined to maintain cash reserves for the purpose of research and development whereas firms in the Manufacturing Sector may require cash mainly for operational and capital expenditures such as acquiring new machinery or replacement of an asset. Therefore, to fulfil these firms' specific requirements, availability of sufficient cash is very important for every going concern but still several costs and benefits are also associated with holding cash. According to Opler, Pinkowitz, Stulz and Williamson (1999), the cost of holding liquid assets includes the lower rate of return of these assets because of a liquidity premium and possibly, tax disadvantages. Yet, there are two main benefits from holding liquid assets. First, the firm saves transaction costs to raise funds and does not have to liquidate assets to make payments. Second, the firm can use the liquid assets to finance its activities and investments if other sources of funding are not available or are excessively costly. Keeping these costs and benefits in view, firms are required to maintain an optimal level of cash.

Masood and Shah (2014) believed that good corporate governance by firms is essential in order to maintain an optimal level of cash. Corporate governance in simple words can be defined as "the system through which businesses are directed and controlled" (Isaksson, 1999). According to the ASX corporate governance council (2014), corporate governance describes "the framework of rules, relationships, systems and processes within and by which authority is

exercised and controlled within corporations." Whereas, La Porta, Lopez-de-Silanes, Shleifer and Vishny (2000) stated that "corporate governance is a set of mechanisms through which outside investors protect themselves against expropriation by the insiders". They further explained "the insiders" as both managers and dominating shareholders of firms.

One of the major advantages of corporate governance is its role in coping with the agency problem which is the conflict of interests between the manager and shareholders. This is due to the reason that management with weak corporate governance can exploit excessive cash holdings for their personal benefits by investing in negative NPV projects (Ammann, Oesch & Schmid, 2010). Resultantly firms in the countries where shareholders' protection is weak and excess cash is mismanaged by managers, potential investors feel reluctant to invest more. In Pakistan, the trend of corporate governance is scratching the surface as the Code of Corporate Governance was formed in 2002. Therefore, most of the studies conducted in Pakistan address corporate governance and cash holdings separately. However, Masood and Shah (2014) studied the impact of corporate governance on cash holdings of non-financial firms listed on KSE. In the present study, a comparative examination of the non-financial firm in the Manufacturing and Services Sector will be conducted to investigate the likely impact of corporate governance on cash holdings since the reasons for holding cash between these two sectors differ from each other.

This study will primarily shade lights on association of corporate governance and cash holding. It will also help firms in determining that how managerial ownership and board structure can alter the ways of corporate governance and thereby moving a step ahead in improving economic performance of the country. Similarly, by highlighting the effect of growth, size, dividend payments, investment opportunities, liquidity and profitability on cash holdings of non-financial firms, this research will enable the firms in manufacturing and services sector of Pakistan to cope up with agency problems by maintaining an optimal level of cash. The main objective of study is to identify the relationship among corporate governance proxies and various control variables (i.e. growth, size, dividend, investment opportunities, liquidity and profitability) on cash holding decision of the KSE listed firms in the manufacturing and services industry of Pakistan.

The remaining paper is organized as follow: Comprehensive discussion about the previous literature is documented in section 2. Section 3 cover the methodology, and empirical results is discussed in section 4. The section 5 of study is about the conclusions.

2. Literature Review

The three most important motives for holding cash is, transaction motives to meet daily operations, precautionary motives for contingencies and third is speculative motives (Keynes, 1936). Cash holding is important because it provides corporations with liquidity; that is, corporations are able to pay off their obligations on time even if bad times hit. Gill and Shah (2012) emphasized that in order to grow sales and profits, a corporation needs to build up cash reserves by ensuring that the timing of cash movements should create an overall positive cash flow situation. Likewise, Cossin and Hricko (2004) described that appropriate cash holdings allow for optimal timing of an investment and hence, avoid the under pricing issue. Therefore, cash is considered as an essential ingredient that enables a business to survive and prosper.

According to tradeoff theory, firms set their optimal level of cash holdings by weighting the marginal costs and marginal benefits of holding cash (Afza & Adnan, 2007). The principal benefit of holding cash is that it constitutes a safety buffer which allows firms to avoid the costs of raising external funds or liquidating existing assets and thus, helps firms to finance their growth opportunities (Levasseur, 1979; Myers & Majluf, 1984). Cash holdings also include reduction in the likelihood of financial distress and pursuance of the investment policy when financial constraints are met (Ferreira & Vilela, 2004). The major cost associated with cash holdings is manager's ability to maximize the shareholder's wealth. If manager fails to serve shareholders interests, the increase in assets under their control will increase their managerial discretion, which will result in agency cost of managerial discretion (Saddour, 2006). Agency problems between shareholders and managers over payout policies remained a reason of conflict, especially for a firm with high cash flow (Byrd, 2010). The extra cash may result in unwise future investments such as ambitious acquisitions (Lang, Stulz & Walkling, 1991). Thus, increase in free cash flow is associated with increase in agency conflicts (Masood & Shah, 2014).

2.1. Link between Corporate Governance and Cash Holdings

In a study conducted by Chen (2008) examined the impact of corporate governance on cash holdings by analyzing 1,500 American firms from 2000 to 2004 on the basis of different investment opportunities. He divided these firms into "old economy" such as manufacturers of durable and non-durable products and "listed new economy" firms such as telecommunications, computer, software, Internet and networking industries. The *listed new economy* were maintaining large amount of cash for investment and research and development purposes. This was supported by the reason that, these firms were adopting good governance practices for shareholder's protection that built investors' confidence to hold more cash. Furthermore, the results of this study highlighted important proxies for corporate governance that in old economy firms the higher managerial ownership will reduce cash holdings. Similarly, Masood and Shah (2014) identified another proxy for corporate governance is the board of directors that plays its role in monitoring and confirming the accuracy of information released to shareholders. They suggested that by increasing board independence, agency problem can be coped up as it reduces managerial control. Chen (2008) further showed that higher board independence increases cash holdings in listed new economy firms. It was justified on the grounds that presence of independent board ensures that the cash is invested by the company in an appropriate manner.

Literature shows that the internal corporate governance mechanism is based on **ownership structure** (Pouraghajan, Pourali & Akbari, 2015). Keeping in view a firm's authority, profit generation and performance, ownership structure is considered as an important factor (Barbosa & Louri, 2002). By considering its significance in corporate governance, researchers have used different dimensions of ownership structure as per their topic under investigation such as Masood and Shah (2014) mentioned three dimensions namely director's ownership, institutional ownership and ownership concentration. While in another study by Almudehki and Zeitun (2012) four different dimensions of ownership concentration are observed namely board ownership, concentrated ownership, foreign ownership, and institutional ownership. A study by Khamis, Hamdan and Elali (2015) documented the relation of ownership structure and firm's performance. After controlling cash holding variables, they found that

ownership concentration has a negative effect with statistical significance firm's performance while institutional ownership has a positive effect on company performance. Managerial ownership has an insignificant effect on company performance, however it was found that managerial ownership has a positive effect on performance only in the case of declining ownership concentration.

By studying publically listed Singaporean firms Kusnadi (2003) examined the impact of non-management blockholder ownership (Non-executive directors holding more than 5% of a firm's stakes) and board size on cash holdings. A significant positive relationship between board size and cash holdings was established, while an inverse relation between non-management blockholder ownership and cash holdings was observed. He concluded that firms having large board and small non-management blockholder ownership have poor corporate governance and therefore hold more cash. It is believed that small boards are more effective in monitoring the CEO's work whereas large boards emphasize more on "Politeness and Courtesy", and believe in CEO discretionary powers (Jensen, 1993). Another study by Lee and Lee (2009) has documented the association between cash holdings, board structure and management ownership structure by using a sample of five Asian countries (Malaysia, Philippines, Indonesia, Singapore and Thailand). They found that strong board i.e. smaller in size, separate CEO and higher independence has a negative relation with cash holding. However, if managerial ownership is increased to a higher level, it will increase their entrenchment and cash holding of the firms will increase.

In contrast to management ownership and boards of directors, institutional investors have become increasingly focused to use their influence on managers to work for the shareholder's interests by using their ownership rights (Cornett, Marcus, Saunders & Tehranian, 2007). Likewise, pension funds and mutual funds are considered as important sources of a firm's monitoring and hence, help in reducing agency costs (Crutchley, Jensen, Jahera & Raymond, 1999). Similarly Harford, Mansi and Maxwell (2008) studied the corporate governance and cash holding behaviour of US firms and found that weaker corporate governance leads to smaller cash holding. While examining the impact of institutional ownership on cash holdings of firms listed on Tehran Stock Exchange (TSE) Ramezani (2011) found that cash holdings of a firm can be reduced by increasing the percentage of ownership held by biggest shareholders of that firm.

Another important proxy of corporate governance is the ownership concentration (Masood & Shah, 2014). In this regard, Shleifer and Vishny (1997) provided a benchmark that "ownership is concentrated when one or several investors in the firm have 10 or 20 percent of equities". Anderson and Hamadi (2009) examined the impact of large powerful shareholders on cash holdings of Belgian firms. They observed a positive association between the level of liquid assets and ownership concentration in general and strong positive association for family firms in particular. This is because family firms face difficulties in diversifying their wealth effectively because of their risk aversive nature. In contrast, Ferreira and Vilela (2004) investigated the determinants of cash holdings in EMU countries and found that firms in countries where shareholders protection is strong and ownership is more concentrated hold less cash than others. Another study by Xingquan and Jie (2007) documented different results from the previous mentioned studies while examining the cash holding behaviour of the publically listed Chinese firms. They showed that ownership concentration, independent directors and leadership structure have no effect on cash holdings while management ownership has a positive effect on corporate cash holdings. This is due to the reason that corporate governance mechanism is not up to the mark in Chinese firms, hence, less monitoring and control leads to increase in agency conflicts (Ping et al. 2011).

It is evident that cash holding is affected by governance mechanism of firms. If shareholders protection is weak, managers have more control and results in agency conflicts (Masood & Shah, 2014). Dittmar, Mahrt-Smith and Servaes (2003) provided strong evidence by considering agency conflicts as an important determinant of corporate cash holding. They worked on a sample taken from 45 countries and found that cash holding in countries where shareholders protection is weak is almost doubled compared to countries with strong shareholders protection. In an another important study regarding corporate governance and value of cash holdings, Dittmar and Mahrt-Smith (2007) argued that the firms having poor corporate governance results in significant value reduction due to excess cash holdings, because of poorly selected investments. Similarly, Kalcheva & Lins (2007) examined the impact of expected managerial agency problems on cash holdings of firms from 31 countries and concluded that when external country-level shareholder protection is weak, controlling managers have an incentive to hold

more cash for personal benefits, which results in firm's underperformance. Daher (2010) also documented agency problem and its impact on corporate governance by taking 60,000 UK firms from 1994 to 2005. He found that higher the ownership concentration, lesser will be the agency problems and ultimately cash holdings level will be reduced.

2.2. Firm-Specific Characteristics Effecting Cash Holdings

Apart from corporate governance proxies, certain firm-specific characteristics related to cash holdings are also noteworthy which might affect the relationship of corporate governance and cash holdings (Kusnadi, 2006; Chen, 2008; Ammann et al. 2010; Masood & Shah, 2014). Researchers have identified several factors that might explain variations in corporate cash holdings i.e. Size, growth, leverage, dividend payouts, capital expenditures, net working capital, cash flow and profitability (Opler et al. (1999); Chen, 2008; Ammann et al. 2010; Ogundipe, Ogundipe, & Ajao, 2012; Masood & Shah, 2014).

Hofmann (2006) examined the determinants of corporate cash holdings of non-financial firms and proposed that the firm's growth opportunities, cash flows variability, leverage, dividend payments, and availability of liquid asset substitutes were the main determinants of corporate cash holdings in New Zealand. Gill and Shah (2010) investigated several factors that determine cash holdings and documented that cash flow, net working capital, leverage, firm size and board size significantly affect cash holdings of Canadian firms. Similarly, in 15 European countries Flipse (2012) concluded that firm specific characteristics are primarily responsible for increase in cash holdings such as increase in Research and Development (R&D) intensity, decrease in net working capital and in case of riskier cash flows. Moreover, in absence of high level of investor's protection, self-interested managers are more likely to spend excess cash on personal ambitions. Likewise, some other determinants of cash holdings are also highlighted by different researchers which are discussed as under:

Growth Opportunities

Firms having more growth opportunities may want to raise capital either through debt or by issuing securities. If a firm is highly leveraged then cost of issuing new bonds and shares will be high (Islam, 2012). Therefore, following pecking order theory, the cost of

cash holding would be less expensive in such a case. According to Saddour (2006) growing firms maintain more cash than mature firms, while it will decrease with an increase in trade credit and research and development in case of mature firms. Kim, Kim, and Woods (2011) examined publically traded restaurant and found that those restaurant which have greater investment opportunities for growth hold more cash than others. Whereas, large restaurant with high capital expenditures and dividend payout ratio hold less cash, which also confirms precautionary and transaction motive of cash holding by restaurant. Similarly, Castiglionesi (2012) while documenting the prominent cash holding determinants of US industrial firms showed that the firms hold more cash when quality investment opportunities are available. Furthermore, he concluded that firms that have better access to capital markets and more substitutes available for cash tend to hold less cash.

Dividend

In a corporate world dividends are a sign of maturity, stability and access to capital markets (Sher, 2014). Dividend paying firms can suspend dividend payment to avoid expensive financing from external sources, and thus expected to hold less cash (Kafayat, Rehman & Farooq, 2014). In case where shareholders protection is weak, firm value can be increased if controlling managers pay dividends (Kalcheva & Lins, 2007). Similarly Ammann et al. (2010) also viewed that high dividend payout ratio can also safeguard the firms with poor corporate governance from poorly selected investments. In contrast a study in emerging market by Mitton (2004) holds the view that, the firms with stronger corporate governance had higher dividend payouts. At the same time negative relationship was established between dividend payouts and growth opportunities. Similarly, Rao (2015) found that dividend payments are positively associated with cash holdings suggesting inclination of Indian firms to hold more cash for the purpose of paying dividends.

Size of Firm

Generally smaller firms have limited access to external financing both in capital market as well as form financial institutions therefore need to hold cash for future investment and operations needs (Carrascal, 2010). Moreover, the cash holding for smaller firms is more strongly linked with cash flows variation. Similar observation were documented by Wai (2013) and found that the association

between corporate governance and holdings is dependent on size of the firm. This study showed that small firms with effective corporate governance intend to hold more cash. Hence, all these findings are in line with the studies conducted by Jensen (1986) and Soku (2011) that smaller firms hold more cash than larger firms.

Leverage

A study conducted by Guney, Ozkan and Ozkan (2007) examined the cash holding behaviour of firms from five countries namely France, Germany, Japan, the UK and the US and found a positive (precautionary effect) association between leverage and cash holding because as leverage increases firms are likely to accumulate larger cash reserves to minimize the risk of financial distress and costly bankruptcy. Additionally, they showed that the impact of leverage on cash holdings is partly dependent upon country-specific characteristics such as the degree of creditor protection, shareholder protection, and ownership concentration. Uyar and Kuzey (2014) analysed the factors which explain the level of corporate cash holdings of Turkish non-financial listed firms over the period 1997 to 2011. The results of the study revealed that the degree of tangibility of assets, financial debt ratio and leverage have negative and significant impact on the cash level. Similarly, Faulkender (2004) analyzed small US firms and confirmed that, these firms hold more cash with an increase in financial leverage.

Capital Expenditures

According to Sher (2014) capital expenditure remained an important control variable to assess the effects of different variables on cash holding, but its association with cash holding varied as either positive or negative, which also signify the active or passive behaviour of the firm. Bates, Kahle and Stulz (2009) suggested that if an increase in capital expenditures creates assets that can be used as collateral for debt, then these capital expenditures can result in an increase in debt capacity and therefore lead to less cash holdings of a firm. Further, Riddick and Whited (2009) argues that, “a productivity shock that increases investment can lead firms to temporarily invest more and save less cash, which would lead to a lower level of cash. At the same time, capital expenditures could proxy for financial distress costs and/or investment opportunities, in which case they would be positively related to cash”. On these grounds, a positive relationship between capital expenditure is confirmed by Azmat

(2011) while a negative relationship between these variables is proved by Kim et al. (2011); Kafayat et al. (2014); Masood and Shah (2014) and Rao (2015).

Cash flows and Cash Flow Volatility

Volatility in cash flows is another determinant of cash holding that arises when future expected payments are not regularly received and cost of financial distress goes up. Therefore, by following Trade off theory such firms hold more cash and a positive relation is expected between cash flow volatility and cash holdings (Islam, 2012). Increase in operational income (cash flow) is positively associated with corporate cash holding (Couderc, 2005). According to Sher (2014) the increase in cash holding of Japanese non financial firms is a result of increase in corporate profitability and uncertainty. Han and Qiu (2007) empirically examined the precautionary motive of holding cash in terms of cash flow volatility of publicly traded U.S firms. They found that financially constrained firms are sensitive to cash flow volatility. This is because the cash flow risk is not fully diversifiable, and precautionary motive promotes these firms to increase cash holdings to overcome such cash flow volatility. These findings are in line with the study conducted by Almeida, Campello and Weisbach (2004).

McVanel and Perevalov (2008) shed light on the financial constraints and cash holding behaviour of Canadian firms from 1990 to 2006. They concluded that higher level cash holding is significantly correlated with Canadian firms having smaller size, more cash flow volatility, less available cash substitutes, higher expenditures on Research and development and being faced by financial distress. Similarly a strong positive relationship was established by Rao (2015) among cash holdings and cash flow, dividend payments, net debt and equity issuance by Indian firms while a strong negative association was observed among cash holdings and net working capital, leverage, capital expenditure, and research and development (R&D) expenditure.

2.3. Theoretical Framework

The dependent variable for the study is cash holdings, which is the variable of primary interest. In order to make an attempt to explain the variance in this dependent variable, this study has extracted three sets of independent variables from the previous literature. Out of these three sets, the first two sets are consisted of

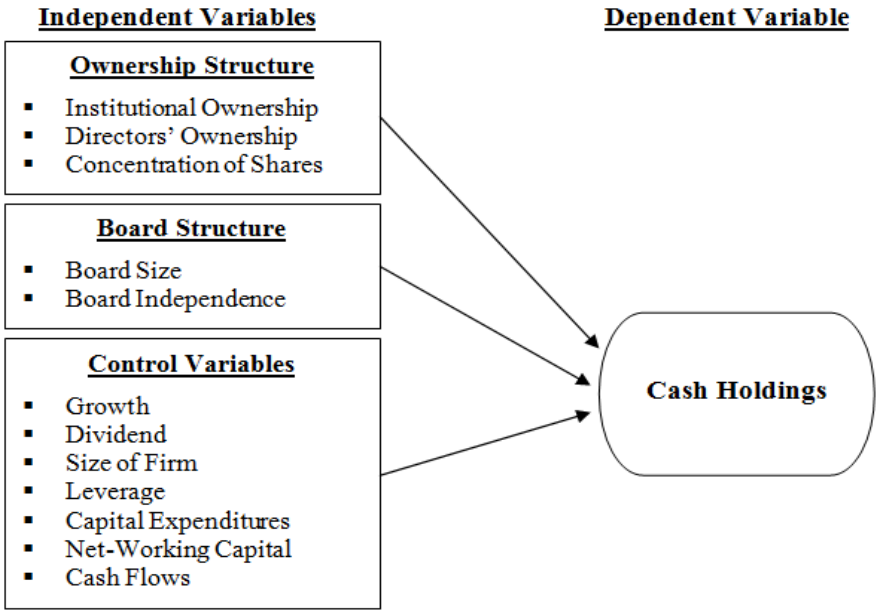
proxies of corporate governance i.e. Ownership structure and Board structure, whereas the third set is comprised of a number of control variables for reducing omitted-variable bias.

2.3.1. Schematic Diagram

The schematic diagram demonstrating the link between independent and dependent variables i.e. corporate governance proxies, a set of control variables and cash holdings respectively, is shown below.

Figure 1

Schematic Diagram



Source: Masood and Shah (2014)

3. Research Methodology

This section discusses the description of the variables and their measurement criteria along with sample and statistical model selected for the study.

3.1. Description and Measurement of Variables

This section discusses the description of the variables and their measurement criteria along with the statistical model selected for the study. Variables as defined by previous studies (Opler et al., 1999; Dittmar et al., 2003; Kusnadi, 2003; Saddour, 2006; Harford et al., 2008; Masood & Shah, 2014) are discussed as follows. Cash holdings (CASH) of the firms is the dependent variable for this study The independent variables include different proxies for corporate governance and a set of control variables. Detail explanation is given in Table 1.

Table 1

List and Measurement of Variables

Variables	Names of Variables	Measured By
Dependent Variable		
	Cash Holdings (CASH)	A ratio of cash and cash equivalents to net assets. Net Assets are Total Assets less cash and cash equivalents
Independent Variables		
Ownership Structure	Institutional Ownership (INST)	It is the shares held by the Institutional Investors divided by Total Number of Shares.
	Directors Ownership (DIRC)	It is the shares held by the directors divided by the total number of shares.
	Concentration (CON)	It is the log of the number of shareholders.
Board Struture	Board Size (BOARD)	The number of directors on the board.
	Board Independence (BIG)	The shares held by the 5 largest shareholders of the firm divided by total number of shares.
Control Variables		
	Growth (GROWTH)	It is the geometric mean of the percentage increase in the total assets.
	Dividend (DIVDUM)	Dividend is a dummy variable. The firms that pay dividend =1 and those not paying dividend =0
	Size of firm (LOGSIZE)	The log of total assets.

	Leverage (LEVE)	It is the ratio of total liabilities to total assets.
	Capital Expenditure (CAPEX)	It is the percentage increase in the gross fixed assets.
	Net working Capital (NW_CASH)	The ratio of Current assets minus cash minus current liabilities to total assets is the networking capital.
	Cash flows (CASHFLOWS)	It is the ratio of addition net income and depreciation to total assets.

3.2. Sample and Sources of Data

A sample of 80 non-financial listed firms for the period 2010 to 2014 is drawn from the target population which is comprised of data obtained from 50 non-financial firms of manufacturing industry (with a total of 250 observations) and 30 non-financial firms of services industry (with a total of 150 observations). The rationale behind excluding financial firms from present study is that their capital structure and profits are different from non-financial firms listed on KSE (Kusnadi, 2003; Shah, 2011; Masood & Shah, 2014). The sources of the data used in the study are the annual reports of the listed firms.

3.3. Statistical Model

A statistical model for this study is designed to quantitatively examine the impact of corporate governance on cash holdings of firms which incorporates all of the aforementioned variables to derive some meaningful results. This model is shown as below.

$$Cash\ Holdings_{i,t} = \alpha + \beta_1\ (Ownership\ Structure)_{i,t} + \beta_2\ (Board\ Structure)_{i,t} + \beta_3 (Control\ Variables)_{i,t} + \varepsilon_{i,t}$$

In the above model the cash holdings of the firm "i" at time "t" is the dependent variable and the independent variables are the ownership structure, the board structure and a set of control variables where "ε" is the error term. "α" is the intercept which shows cash holdings of firm "i" at time t = 0, whereas β_1, β_2 and β_3 is the slope of independent variables i.e. ownership structure, board structure and control variables respectively.

To test the relationship between corporate governance and cash holdings regression technique is used in the study. Panel data analysis is used in the present study because it contains both time-series and cross-sectional features. Panel data is also helpful in controlling unobserved heterogeneity i.e. one instance in where a

correlation between observable variable and unobservable variable is expected (Masood & Shah, 2014). Putting differently, it allows controlling for omitted (unobserved or mis-measured) variables. Another motivation for using this technique is that it increases sample size and involves more variability.

4. Results and Analysis

In this section, a detailed analysis is conducted for finding the impact of corporate governance on cash holdings of non-financial firms in the manufacturing and services industry of Pakistan. Starting from descriptive analysis and then OLS regression is applied on both non-financial firms in the manufacturing and services industry. To select the best model between fixed and random effect regression models, Hausman test is used. The results in Table 3B in Appendix of Hausman test derived from the data of non-financial manufacturing firms shows that fixed effect regression model is more appropriate model (P-value is 0.0178 which is less than 0.05). Similarly Table 4B in Appendix presents the results for Hausman test for non-financial servicing firms. The P-value is 0.6633 which is far greater than 0.05 showing that the null hypothesis will be accepted i.e. random effect is a good model.

4.1. Descriptive Statistics

The Table 2 highlights the summary statistics of sampled 50 non-financial listed firms, these firms containing name of variables in the first column followed by mean, median, mode, standard deviation, sample variance and minimum and maximum value.

These results show that on average, non-financial firms in manufacturing industry hold 5.35% cash and cash equivalents *(CASH).* Institutional investors *(INST)* hold 17.53% shares and directors *(DIRC)* have 43.35% shares out of the total share of firms. Similarly the concentration of shares *(CON)* and board size *(BOARD)* is 7.76% and 8.24% respectively. However, shares held by five largest shareholders in the manufacturing industry *(BIG)* is 69.19% on average whereas, growth *(GROWTH),* dividends *(DIVDUM),* leverage *(LEVE),* capital expenditures *(CAPEX),* net-working capital *(NW_CASH)* and cash flows *(CASHFLOWS)* are 9.29%, 58.80%, 54.28%, 7.22%, 3.41% and 12.31% respectively.

Table 2

Descriptive Statistics of Firms in the Manufacturing Industry

Variables	Mean	Median	Mode	Standard Deviation	Sample Variance	Min	Max
CASH	0.0535	0.0141	0.0029	0.1356	0.0184	0.0001	1.6566
INST	0.1753	0.1114	0.0002	0.1921	0.0369	0.0002	0.8696
DIRC	0.4335	0.0667	0.0000	3.8780	15.0391	0.0000	61.3800
CON	7.7637	7.5600	7.1900	1.0141	1.0283	5.5900	10.5600
BOARD	8.2440	8.0000	7.0000	1.4341	2.0567	6.0000	13.0000
BIG	0.6919	0.7219	0.8010	0.1758	0.0309	0.0562	0.9782
GROWTH	0.0929	0.0715	0.0987	0.1102	0.0121	-0.1585	0.6780
DIVDUM	0.5880	1.0000	1.0000	0.4932	0.2432	0.0000	1.0000
LOGSIZE	15.2747	15.3850	15.3700	1.5212	2.3140	10.0900	18.5600
LEVE	0.5428	0.5495	0.7090	0.2563	0.0657	0.0060	1.9620
CAPEX	0.0722	0.0345	0.0000	0.1652	0.0273	-0.8371	0.8891
NW_CASH	0.0341	0.0240	0.0116	0.2252	0.0507	-0.7169	0.9862
CASHFLOWS	0.1231	0.0747	0.0778	0.6334	0.4012	-0.7777	9.9463

Table 3

Descriptive Statistics of Firms in the Services Industry

Variables	Mean	Median	Mode	Standard Deviation	Sample Variance	Min	Max
CASH	0.1027	0.0525	0.0016	0.1413	0.0200	0.0001	0.8642
INST	0.2431	0.1577	0.1004	0.2211	0.0489	0.0056	0.9700
DIRC	0.1043	0.0010	0.0000	0.1704	0.0290	0.0000	0.5590
CON	8.0955	7.9750	6.6700	1.3246	1.7545	5.0110	10.9690
BOARD	8.6600	8.0000	7.0000	2.0360	4.1454	5.0000	15.0000
BIG	0.6825	0.7332	0.5772	0.1914	0.0366	0.3210	0.9777
GROWTH	0.1376	0.0954	0.0000	0.2368	0.0561	-0.1660	1.4704
DIVDUM	0.6200	1.0000	1.0000	0.4870	0.2372	0.0000	1.0000
LOGSIZE	16.1787	16.1450	15.9300	1.6074	2.5837	12.9000	19.4900
LEVE	0.6041	0.5040	0.4260	0.4003	0.1602	0.0590	2.1110
CAPEX	0.1002	0.0397	0.0000	0.3284	0.1079	-0.8289	2.2875
NW_CASH	-0.0312	0.0297	0.0000	0.3471	0.1205	-1.1684	0.5746
CASHFLOWS	0.0580	0.0862	0.0488	0.1456	0.0212	-0.9486	0.4369

Similarly, Table 3 presents the descriptive statistics of a sample of 30 non-financial listed firms in the services industry. These results show that on average, non-financial firms in services industry hold 10.27% cash and cash equivalents *(CASH).* Institutional investors *(INST)* hold 24.31% shares and directors *(DIRC)* have 10.43% shares out of the total share of firms.

4.2. Simple Ordinary Least-Square Regression Model

The empirical results of simple ordinary least square method are shown in Table 4. These results are obtained by taking an overall sample of 80 non-financial firms of manufacturing and services industry of Pakistan along with embedding a dummy variable (DUM) is equal to "1" for non-financial manufacturing firms and "0" otherwise. The dependent variable is cash holding (CASH). In the first column, list of variables is shown whereas beta coefficients are shown in the second column, followed by standard error, t-statistics and probability value in the third, fourth and fifth column respectively. The overall significance or validity of the model is good as value of F-statistics is 7.08, which is greater than 4 showing that the model is a good fit with the P-value of 0.000. R-square value is 0.1926 showing that 19.26% variations in the dependent variable are explained by the independent variables.

Table 4 shows that concentration of shares *(CON),* number of shares held by five largest shareholders *(BIG)* and dividend *(DIVDUM)* are significantly and positively related whereas leverage *(LEVE)* and net-working capital *(NW_CASH)* are significantly and negatively related to cash holdings of non-financial listed firms in the manufacturing and services industry of Pakistan. Similarly, the *(DUM)* variable is also significant which indicates that the cash holdings pattern of manufacturing firms differs from the servicing firms based on differences in their operational needs and R & D expenditures. However, the institutional ownership *(INST)* and growth *(GROWTH)* are found to be positively related to cash holdings but insignificant. In contrast, the directors' ownership *(DIRC),* board size (BOARD), size of firm (LOGSIZE), capital expenditure (CAPEX) and cash flows (CASHFLOWS) are observed as negatively related to cash holdings but insignificant in context of non-financial firms of manufacturing and services of Pakistan.

Table 4

Results of Simple OLS Regression

Dependent Variable: *CASH*
Method: Least Squares Regression
Sample: 80
Included observations: 400

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018382	0.086303	0.212994	0.8314
INST	0.019493	0.033979	0.573691	0.5665
DIRC	-0.002294	0.002124	-1.079674	0.2810
CONC	0.014392	0.007092	2.029188	0.0431
BOARD	-0.007461	0.004576	-1.630682	0.1038
BIG	0.203086	0.036718	5.531024	0.0000
GROWTH	0.005432	0.041464	0.131006	0.8958
DIVDUM	0.060375	0.015284	3.950173	0.0001
LOGSIZE	-0.005556	0.004987	-1.114050	0.2660
LEVE	-0.099653	0.031379	-3.175764	0.0016
CAPEX	-0.011715	0.027011	-0.433711	0.6647
NW_CASH	-0.092368	0.040195	-2.298026	0.0221
CASHFLOWS	-0.008539	0.012895	-0.662248	0.5082
DUM	-0.050074	0.014156	-3.537395	0.0005
R-squared	0.192651			
Adjusted R-squared	0.165461			
S.E. of regression	0.127579			
F-statistic	7.085251			
Prob (F-statistic)	0.000000			

4.3. Fixed Effect Regression Model for Non-Financial Manufacturing Firms

The resulted shown in Table 5 elaborate the results of fixed effect regression model for non-financial firms in manufacturing industry of Pakistan. The significance level of 5% is used in this regression model. A total of 250 observations from 50 non-financial manufacturing firms are included in the panel from 2010 to 2014. Balanced panel is used because data is collected for the same variables in the same time period. Results of the fixed effect regression model indicate that this model fits the data as the value of F-statistics is 4.897, which is greater than 4. Coefficient of determination i.e. the value of R-square is 0.6137 showing that

61.37% variation in the dependent variable *(CASH)* is due to independent variables included in the study.

The institutional ownership *(INST)* is the first proxy included in the study for corporate governance mechanism. Results show that institutional shareholding *(INST)* is positively related with cash holdings *(CASH)* but insignificant. With an increase in institutional ownership *(INST)* by one unit, cash holding of non-financial manufacturing firms will increase by 0.0346 units. These results are in line with the previous studies conducted by Harford et al. (2008); Masood and Shah (2014); Ullah, Saeed and Zeb (2014) who found a positive association between cash holdings and institutional shareholdings. This shows that in a country like Pakistan, where corporate governance is weak, inside owners hold more cash and outside investors cannot force them to pay dividends. Another reason for this insignificant positive relationship might be that some firms maintain large cash for stable dividend payments to these institutional investors. But in Pakistani manufacturing firms, high institutional shareholdings do not cause firms to increase in their total payouts as indicated by Afza and Mirza (2011) because institutional investors such as banks, joint-stock companies and financial institutions have different preferences towards dividends. Such as insurance companies demands more dividend, so firms in which insurance companies hold more shares are likely to hold more cash for dividend payments. In contrast, NIT and Modarbah companies might have less proportion of shares in these companies so cannot significantly influence cash holdings for dividend payments.

Table 5

Fixed Effect Regression Results for Manufacturing Firms

Dependent Variable: CASH
Method: Panel Least Squares
Sample: 2010-2014
Periods included: 5
Cross-sections included: 50
Total panel (balanced) observations: 250

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INST	0.034613	0.063752	0.542934	0.5878
DIRC	-0.000244	0.001787	-0.136450	0.8916
CONC	-0.093017	0.067241	-1.383335	0.1682
BOARD	-0.014397	0.013535	-1.063711	0.2888

BIG	0.042210	0.103607	0.407405	0.6842
GROWTH	0.305667	0.121940	2.506707	0.0130
DIVDUM	0.035491	0.022241	1.595784	0.1122
LOG_SIZE	-0.106291	0.034644	-3.068096	0.0025
LEVE	-0.268183	0.075064	-3.572700	0.0004
CAPEX	-0.046975	0.048329	-0.971981	0.3323
NW_CASH	-0.308952	0.086248	-3.582146	0.0004
CASH_FLOWS	-0.005420	0.010745	-0.504451	0.6145

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.613749	Mean dependent var	0.053474
Adjusted R-squared	0.488423	S.D. dependent var	0.135618
S.E. of regression	0.097000		
F-statistic	4.897215		
Prob (F-statistic)	0.000000		

Directors' ownership *(DIRC)* is another proxy for corporate governance. The relationship between directors' ownership *(DIRC)* and cash holdings *(CASH)* of non-financial manufacturing firms is negative but highly insignificant. This result is consistent with previous literature i.e. increase in managerial ownership will reduce cash holdings (Chen, 2008; Zia-ul-Hannan and Asghar, 2013; Masood & Shah, 2014; Ullah, Saeed & Zeb, 2014). However, the insignificance of this result is an indication of weak corporate governance in Pakistan.

The concentration of shares *(CON)* with the coefficient of -0.093 is negatively and insignificantly related to cash holdings *(CASH)* of non-financial firms in manufacturing industry. This result is supported by the study of Anjum and Malik (2013) and Daher (2010) showing that high ownership concentration leads to less cash holdings in order to avoid agency conflicts. However, due to weak legal system, such increase in concentration of shares does not contribute to increase in monitoring and control over managers in terms of cash manipulation, hence the relationship is insignificant.

Similarly, the coefficient of board size *(BOARD)* is negative i.e. -0.0143 but again insignificant. Studies conducted by Harford et al. (2008) and Masood and Shah (2014) support the finding of this study that board members are responsible in effective monitoring and

control of the activities of manager and thereby contributing to less cash holdings. But being insignificant in case of non-financial firms in manufacturing industry, these results indicate that corporate governance is not effective in Pakistan and directors do not play their role well in determining cash level of these firms in manufacturing industry (Razzaq & Naeem-Ullah, 2014).

Board independence *(BIG)* with coefficient 0.0422 showed a positive but insignificant relationship with cash holdings of manufacturing firms. Dittmar et al. (2003) supports this result as increase in ownership percentage by five largest shareholders of firm leads to an increase in cash holdings for investment in profitable projects. However, in a country like Pakistan where shareholders protection is weak, presence of block holders on the board does not ensure their ability to effectively monitor that whether such increase in cash holdings will ultimately be invested in profitable projects by managers or not. Therefore, the relation comes out to be insignificant for non-financial manufacturing firms.

The variable growth *(GROWTH)* has a positive and significant relationship with cash holdings of firms in the manufacturing industry. The coefficient of growth *(GROWTH)* is positive i.e. 0.3056 indicating that one unit increase in growth *(GROWTH)* will cause an increase in cash holdings *(CASH)* of firms in manufacturing industry by 0.3056 units. The results show that growing firms in the manufacturing industry hold more cash with them as compared to mature firms. These results are consistent with study conducted by Saddour (2006), Kim et al. (2011) and Castiglionesi (2012). However, the results are inconsistent with the findings of Masood and Shah (2014) which showed a positive but insignificant relationship between growth and cash holdings of Pakistani firms.

The study shows a positive and insignificant relationship of dividend payments *(DIVDUM)* and cash holdings with a coefficient of 0.0354 indicating that manufacturing firms in Pakistan do not hold cash for dividend payments. Though, the positive relationship between dividend payments and cash holdings is consistent with the study conducted by Ammann et al. (2010) and Masood and Shah (2014) showing that dividend payments minimizes the possibility of cash to be invested in negative-NPV projects but the insignificance of this relationship indicates that weak shareholders protection in Pakistan does not guarantee these dividend to be paid on consistent basis.

Size of firm *(LOGSIZE)* showed a negative and significant relationship with cash holdings of firms in manufacturing industry. With a coefficient of -0.1062, the results indicate that an increase in size of firm *(LOGSIZE)* by one unit will cause a decrease in cash holdings of firms by 0.1062 units. This finding is consistent with the work of Jensen (1986), Dittmar et al. (2003), Carrascal (2010), Soku (2011) and Wai (2013) that smaller firms hold more cash than the larger firms. This is because larger firms have better access to capital markets (Carrascal, 2010), well diversified with less chances of bankruptcy and economies of scale in issuing new securities (Drobetz & Grüninger, 2007). However, these results are inconsistent with the study of Afza and Adnan (2011), Azmat (2011) and (Islam, 2012).

Similarly, the relationship of variable leverage *(LEVE)* is found to be negatively significant with the cash holdings of non-financial manufacturing firms. With a coefficient of -0.2681, the results indicate that an increase in leverage *(LEVE)* by one unit will cause a decrease in cash holdings of firms by 0.2681units. This result is consistent with the study of Afza and Adnan (2011), Zia-ul-Hannan and Asghar (2013), Masood and Shah (2014) and Uyar & Kuzey (2014). Firms in manufacturing industry with higher debt have less cash with them as cost of debt servicing rises with an increase in leverage. Also, debt can be used as a substitute for cash (Shah, 2011). However, these results are found to be inconsistent with Guney et al. (2007) and Oplers et al. (1999) who found a positive relationship between leverage and cash holdings.

Net-working capital *(NW_CASH)* is negatively and significantly related with cash holdings of firms in manufacturing industry. Results showed that an increase in net-working capital *(NW_CASH)* by one unit will bring a decrease in cash holdings of these firms by 0.3089. The results are consistent with Basheer (2014), Masood and Shah (2014) who showed that "the net-working capital is the close substitute of cash for firms." These findings are contrary to the studies by Aslam (2013), Zia-ul-Hannan and Asghar (2013), Kafayat et al. (2014) who found a positive relationship between these variables.

The results of the fixed effect regression model also showed that the relationship of capital expenditures *(CAPEX)* and cash flows *(CASHFLOWS)* is negative but insignificant with cash holdings for manufacturing firms in Pakistan. These results show that increase in investment opportunities and profitability do not affect cash holdings of manufacturing firms.

4.4. Random Effect Regression Model for Non-Financial Firms in the Services Industry

The results of random effect regression model for non-financial firms in services industry of Pakistan are presented in Table 6. Similarly, the results of fixed effects are shown in Table 2B, in the Appendix.

The significance level of 5% is used in this regression model. A total of 150 observations from 30 non-financial servicing firms are included in the panel from 2010 to 2014. Balanced panel is used because data is collected for the same variables in the same time period. Independent variables are shown in the first column. Results indicate that this model fits the data as the value of F-statistics is 4.255, which is greater than 4. Coefficient of determination i.e. the value of R-square is 0.3649 showing that 36.49% variation in the dependent variable *(CASH)* is due to independent variables included in the study.

Those independent variables which have significant impact on cash holdings of firms in services industry are discussed first, followed by other variables having insignificant but opposite effect on cash holdings in comparison with firms in the manufacturing industry.

Board independence *(BIG)* showed a significantly positive relationship with the cash holdings of firms, with a coefficient of 0.0406 indicating that one unit increase in board independence *(BIG)* will cause an increase in cash holdings *(CASH)* of firms in services industry by 0.0406 units. With an increase in the percentage of shares held by five big shareholders of the firm, the cash holding will rise because such share holders will have more influencing power on manager to hoard more cash (Masood & Shah, 2014). The finding is also consistent with the study conducted by Chen (2008) that since firms in telecommunications, computer, software, Internet and networking industries where the investment opportunities are relatively high as compared to manufacturing firms of durable and non-durable products with limited investment opportunities available therefore such firms hold more cash. Same is the case of firms in services industry of Pakistan where presence of big shareholders on board ensures that cash is invested in appropriate manner for investment in R & D and other profitable projects, so increase in cash holdings occurs in services industry. This result is inconsistent with the study of Kusnadi (2003) who found a negative relationship between board independence and cash holdings.

Table 6

Random Effect Regression Results for Servicing Firms

Dependent Variable: CASH
Method: Panel Regression (Cross-section random effects)
Sample: 2010-2014
Periods included: 5
Cross-sections included: 30
Total panel (balanced) observations: 150

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INST	0.116764	0.081612	1.430711	0.1548
DIRC	0.040682	0.103627	0.392582	0.6952
CONC	0.005146	0.017025	0.302252	0.7629
BOARD	-0.001481	0.009826	-0.150744	0.8804
BIG	0.321882	0.112400	2.863730	0.0048
GROWTH	0.055059	0.051256	1.074193	0.2846
DIVDUM	0.065356	0.026165	2.497793	0.0137
LOG_SIZE	-0.004790	0.015320	-0.312683	0.7550
LEVE	-0.188866	0.059629	-3.167355	0.0019
CAPEX	-0.003901	0.021265	-0.183421	0.8547
NW_CASH	-0.229187	0.067519	-3.394403	0.0009
CASHFLOWS	-0.072591	0.076807	-0.945110	0.3463

R-squared	0.364970	Mean dependent var	0.029360
Adjusted R-squared	0.101828	S.D. dependent var	0.081574
S.E. of regression	0.077739		
F-statistic	4.255492		
Prob (F-statistic)	0.012302		

The study shows a positive and significant relationship of dividend payments *(DIVDUM)* and cash holdings with a coefficient of 0.0653 indicating that servicing firms in Pakistan hold cash for dividend payments. The same result between these variables was observed by Rao (2015) while examining Indian listed firms. Likewise, this positive relationship between dividend payments and cash holdings is consistent with the study conducted by Ammann et al. (2010) and Masood and Shah (2014) showing that dividend payments minimizes the possibility of cash to be invested in negative-NPV projects. Similarly, since most of the corporate governance proxies in this study are found to be insignificant showing weak corporate

governance in the services industry, Ammann et al. (2010) suggests that the firms in such industries can still be able to make profit from cash holding by maintaining high dividend payouts even if the corporate governance is poor.

The relationship of variable leverage *(LEVE)* is found to be negatively significant with the cash holdings of non-financial servicing firms. With a coefficient of -0.1994, the results indicate that an increase in leverage *(LEVE)* by one unit will cause a decrease in cash holdings of firms by 0.1994units. This result is same for firms in both of the manufacturing and services industry of Pakistan but the magnitude of this relationship is slightly higher for the firms in manufacturing industry i.e. 0.2681 showing that the increase in level of debt causes a greater decrease in cash holding level of manufacturing firms than the servicing firms.

Similarly, net-working capital *(NW_CASH)* is negatively and significantly related with cash holdings of firms in services industry. Results showed that an increase in net-working capital *(NW_CASH)* by one unit will bring a decrease in cash holdings of these firms by 0.2291. A similar result was also observed in the manufacturing industry but the impact of networking capital on cash holdings of manufacturing firms is high as compared to servicing firms which indicates that the manufacturing firms rely more on use of networking capital as a substitute of cash than firms in the services industry of Pakistan.

In case of directors' ownership *(DIRC)* in servicing firms, an opposite but insignificant is observed as compared to manufacturing firms. The relationship between directors' ownership *(DIRC)* and cash holdings *(CASH)* of non-financial servicing firms is positive but insignificant. The coefficient of directors' ownership *(DIRC)* is 0.0406 showing that an increase in directors' ownership *(DIRC)* by one unit, cash holding of non-financial servicing firms will increase by 0.0406 units. The positive nature of this relationship is consistent with Morck, Shleifer and Vishny's (1988), Lee and Lee (2009), Ping et al. (2011) which indicates that due to weak corporate governance, directors do not play their role well and are involved in more cash holdings in services industry.

Similarly, the relationship of concentration of shares *(CON)* is positively and insignificantly related to cash holdings *(CASH)* of non-financial firms in services industry. The coefficient of concentration of shares *(CON)* is 0.0051 showing that an increase in concentration of

shares *(CON)* by one unit, cash holding of non-financial servicing firms will increase by 0.0051 units. La Porta et al. (2000) and Masood and Shah (2014) explained the positivity of such relationship as the founders of firms existing in a weak legal environment try to hold more cash in order to avail profitable investment opportunities. But this impact is insignificant in context of servicing firms of Pakistan.

However, some variables in the present study (as discussed in the previous section in detail) are found to have the same insignificant impact on cash holdings of firms in the services industry as observed in the manufacturing industry. These variables include institutional ownership *(INST)*, board size *(BOARD)*, capital expenditure *(CAPEX)* and cash flows *(CASHFLOWS).*

5. Conclusions

The main findings of the study reveal that the cash holding pattern of firms in the services sector differs significantly from the manufacturing sector due to differences in their operational needs and R & D investments. Generally servicing firms hold more cash as compared to manufacturing firms. Moreover, in case of manufacturing firms, the growth is found to be positively related with cash holdings while size of firm, leverage and networking capital are negatively related with the cash holdings. On the other side, for servicing firms, board independence and dividend are directly related to cash holdings while leverage and net-working capital are negatively related to cash holdings by these firms. However, most of the corporate governance proxies are found to be insignificant, which is an indication of weak corporate governance in Pakistan in determining the cash holding decision of firms in manufacturing and services industry.

The findings of this study suggest that in manufacturing industry the impact of institutional ownership is positive but insignificant which implies due to weak corporate governance in Pakistan. Inside owners hold more cash and outside investors cannot force them to pay dividends. Additionally, institutional preferences towards dividend are also different which ultimately affects their ability to influence cash holding decision of these firms. The relationship of directors' ownership, concentration of shares and board size with cash holdings is negative and insignificant which indicates that increase in number of shares held by directors, ownership concentration and number of directors on board respectively, do not

contribute to increase in monitoring and control over managerial activities in terms of cash manipulation in manufacturing firms. This further confirms the existence of weak governance mechanism in manufacturing industry. Moreover, the board independence is positively but insignificantly related with cash holdings of manufacturing firms which suggests that although an increase in the percentage of ownership held by five biggest shareholders of a firm leads to an increase in cash holdings for availing profitable investment opportunities. As the investment opportunities are limited and shareholders protection is weak, the board independence in such a situation does not guarantee the manger's investments in profitable projects.

In manufacturing industry, the growth of firms is positively and significantly related with cash holdings indicating that growing firms hold more cash with them. In contrast, the relationship of firm's size with cash holdings is significantly negative, suggesting that small manufacturing firms hold more cash with them because of limited access to capital markets than the large firms in manufacturing industry. Likewise, leverage and net-working capital are negatively related with cash holdings implying that debt and net-working capital can be used as a substitute for cash in manufacturing firms. However, the relationship of dividend, capital expenditure and cash flows is insignificant in case of cash holdings of manufacturing firms suggesting that these firms do not hold cash for dividend payments and increase in investment opportunities and profitability do not affect cash holdings.

For services industry, the present study reveals that the relationship of board independence is significantly positive with cash holdings, suggesting that the increase in percentage of shares held by five biggest shareholders of a firm will increase cash holdings because such shareholders will be having more influential power on managers to hoard cash as more investment opportunities are available in services industry as compared to manufacturing industry. Also the presence of independent board in such firms ensures that excess cash would be invested in appropriate manner on R & D and other profitable projects which ultimately build investors' confidence for large cash holdings in servicing firms in Pakistan. The impact of other corporate governance proxies' i.e. institutional ownership, directors' ownership and ownership concentration on cash holdings of firms is insignificant for the services industry. After examining the

impact of control variables on cash holdings of servicing firms, the study concludes a direct relationship between dividend payments and cash holdings of these firms. This shows that servicing firms hold cash for dividend payments. In contrast, the relationship of cash holdings with leverage and net-working capital of firms in services industry is same as that of manufacturing industry i.e. significantly negative. However, the impact of these two factors was higher on cash holdings of the manufacturing firms than the servicing firms.

Under the guidance of above findings firms in the manufacturing industry can improve their governance practices to strengthen the investors' confidence by ensuring an effective utilization of excess cash holdings. Moreover, by active role of the directors and vigilant oversight of manager, the excess cash can be utilized in profitable projects. With better access to capital markets firms in manufacturing sector especially with low borrowing should hold less cash. However, firms in the services industry, in addition to enhancing board of directors' role can utilize influential power of the biggest shareholders for maintaining optimal cash level.

The major limitation was the time-constraint and excess to data. More improved results can be obtained by increasing sample size for an extended time period. Moreover, firm which do not disclose consistent annual reports and data regarding some important variables such as institutional ownership and directors' ownership are also excluded from study, but can be incorporated by use of primary data. Analyzing the impact of corporate governance on cash holdings of firms offering financial services can be a worthwhile research. Similarly, impact of other corporate governance proxies such as foreign ownership on cash holdings can also be examined in context of Pakistani firms. Moreover, cross country analysis among the developing countries and the developed countries can also be a considerable dimension for future research.

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APPENDIX A

Table 1A

Classification of Services Sector in Pakistan

I. <u>Distributive Services</u> • ***Transport, Storage and Communications***	▪ Railways ▪ Water Transport ▪ Air Transport ▪ Pipeline Transport ▪ Road Transport ▪ Mechanized ▪ Non- Mechanized ▪ Communications ▪ Storage ▪ Water Transport
• ***Wholesale, Retail Trade and Hotels and Restaurants***	▪ Wholesale and Retail Trade including Imports ▪ Purchase and Sale Agents and Brokers ▪ Auctioning
II. <u>Producer Services</u> • ***Financial Institution***	▪ State Bank of Pakistan ▪ Commercial Bank ▪ Other Financial Intermediaries ▪ Insurance Corporations and Pension Funds
III. <u>Personal Services</u> • ***Entertainment and Recreation Services*** • ***Ownership and Dwelling***	
IV. <u>Social Services</u> • ***Public Administration and Defense*** • ***Social Community and Private Services***	▪ Education ▪ Medical and Health Services Other Household and Community Services

Source: Economic Survey of Pakistan (2015)

Table 2A

Non-Financial Manufacturing Firms

Manufacturing Sector	Number of Firms	Percentage (%)
Automobile assembler	2	4.00
Automobile parts and accessories	2	4.00
Cable & electrical goods	2	4.00
Cement	8	16.00
Chemical	9	18.00
Engineering	6	12.00
Fertilizers	3	6.00
Food & personal care products	8	16.00
Glass and ceramics	2	4.00
Paper and board	3	6.00
Sugar and allied industries	5	10.00
Total	**50**	**100**

Table 3A

Non-Financial Firms Servicing Firms

Services Sector	Number of Firms	Percentage (%)
Power generation and distribution	6	20.00
Technology and communication	5	16.67
Industrial transportation	2	6.67
Media	2	6.67
Pharmaceuticals and bio-tech	9	30.00
Travel and leisure	2	6.67
Oil and gas marketing companies	4	13.32
Total	**30**	**100**

APPENDIX B

Table 1B

Random Effect Regression Results for Manufacturing Firms

Dependent Variable: CASH				
Method: Panel Regression (Cross-section random effects)				
Sample: 2010-2014				
Periods included: 5				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
INST	0.0129	0.0511	0.2539	0.7997
DIRC	-0.0009	0.0018	-0.5039	0.6148
CONC	0.0158	0.0152	1.0402	0.2993
BOARD	-0.0118	0.0089	-1.3305	0.1846
BIG	0.1468	0.0651	2.2566	0.0249
GROWTH	0.0851	0.0945	0.9012	0.3684
DIVDUM	0.0537	0.0196	2.7389	0.0066
LOG_SIZE	-0.0085	0.0097	-0.8779	0.3809
LEVE	-0.1214	0.0539	-2.2525	0.0252
CAPEX	-0.0462	0.0458	-1.0099	0.3136
NW_CASH	-0.1828	0.0666	-2.7467	0.0065
CASH_FLOWS	-0.0063	0.0106	-0.5973	0.5509
Effects Specification				
R-squared	0.0918	Mean dependent var		0.0243
Adjusted R-squared	0.0459	S.D. dependent var		0.1019
F-statistic	1.9962			
Prob(F-statistic)	0.0253			

Table 2B

Fixed Effect Regression Results for Servicing Firms

Dependent Variable: CASH				
Method: Panel Regression (Cross-section random effects)				
Sample: 2010-2014				
Periods included: 5				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
INST	0.0129	0.0511	0.2539	0.7997
DIRC	-0.0009	0.0018	-0.5039	0.6148
CONC	0.0158	0.0152	1.0402	0.2993
BOARD	-0.0118	0.0089	-1.3305	0.1846

BIG	0.1468	0.0651	2.2566	0.0249
GROWTH	0.0851	0.0945	0.9012	0.3684
DIVDUM	0.0537	0.0196	2.7389	0.0066
LOG_SIZE	-0.0085	0.0097	-0.8779	0.3809
LEVE	-0.1214	0.0539	-2.2525	0.0252
CAPEX	-0.0462	0.0458	-1.0099	0.3136
NW_CASH	-0.1828	0.0666	-2.7467	0.0065
CASH_FLOWS	-0.0063	0.0106	-0.5973	0.5509
Effects Specification				
R-squared	0.0918	Mean dependent var		0.0243
Adjusted R-squared	0.0459	S.D. dependent var		0.1019
F-statistic	1.9962			
Prob(F-statistic)	0.0253			

Table 3B

Hausman Test for Manufacturing Firms

Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random	24.426450	12	0.0178

Cross-section random effects test comparisons:

Variable	**Fixed**	**Random**	**Var(Diff.)**	**Prob.**
INST	0.03461	0.012970	0.001456	0.5706
DIRC	-0.00024	-0.000881	0.000000	0.0886
CONC	-0.09302	0.015784	0.004291	0.0967
BOARD	-0.01439	-0.011766	0.000105	0.7973
BIG	0.04221	0.146817	0.006501	0.1945
GROWTH	0.30567	0.085118	0.005948	0.0042
DIVDUM	0.03549	0.053669	0.000111	0.0840
LOG_SIZE	-0.10629	-0.008467	0.001107	0.0033
LEVE	-0.26818	-0.121361	0.002732	0.0050
CAPEX	-0.04698	-0.046246	0.000239	0.9624
NW_CASH	-0.30895	-0.182838	0.003007	0.0215
CASH_FLOWS	-0.00542	-0.006300	0.000004	0.6678

Table 4B

Hausman Test for Non-Financial Servicing Firms

Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random	9.459238	12	0.6633
Cross-section random effects test comparisons:			
Variable	**Fixed**	**Random**	**Var(Diff.)**	**Prob.**
INST	0.190077	0.116764	0.008003	0.4125
DIRC	0.007125	0.040682	0.009267	0.7274
CONC	0.023971	0.005146	0.000314	0.2878
BOARD	0.003818	0.001481	0.000093	0.8087
BIG	0.386772	0.321882	0.027173	0.6938
GROWTH	0.029574	0.055059	0.000873	0.3885
DIVDUM	0.053828	0.065356	0.000146	0.3407
LOG_SIZE	0.027455	-0.004790	0.000832	0.2635
LEVE	-0.199471	-0.188866	0.001584	0.7899
CAPEX	-0.010169	-0.003901	0.000022	0.1782
NW_CASH	-0.258097	-0.229187	0.000860	0.3242
CASH_FLOWS	-0.107720	-0.072591	0.000888	0.2385