

# Empirical Analysis of Factors Affecting Cash Holdings in Non-Financial Firms: Evidence from Public Listed Firms of Pakistan

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## Abstract

*Liquidity management has always remained one of the most important decisions for any firm. In order to take such decisions it is important to know about the factors that affect the cash holdings of firms. Therefore, the aim of the paper is to find out the factors that affect the cash holdings of non-financial public listed firms. To achieve our goal, the study used fixed effect regression model. The study has taken 349 non-financial Pakistani firms listed on KSE100 index for the time period 2005 to 2012. The results reveal that capital employed and leverage has positive impact on cash holdings. However, the result is statistically insignificant for the capital employed. Cash flow, networking capital and size has negative and significant impact on cash holding. The global financial crisis has negative impact but the result is not statistically significant indicating that it has no statistically significant impact on cash holding of non-financial firms of Pakistan.*

**Key words:** Cash holdings, non-financial firms, Leverage

## Introduction

Holding of cash by firms is one of the important and attention getting portion of the balance sheet. It always has remained a very tough challenge for financial managers of different firms. Cash and cash equivalents serve as lubricant for the smooth operations of the firms. Managers can maintain the optimum level of liquidity either in cash form or equivalents of cash in order to finance their day to day activities without incurring extra charges of credit facilities

Holding liquidity is important and so are the reasons behind holding it. The two important reasons for holding cash and cash equivalents are the precautionary motive and transaction cost motive as explained by Almeida et.al (2002).The author argues that maintaining suitable amount of liquidity is very much necessary for efficient operations of a business. Managers hold the liquidity for the purpose to make payments to shareholders as well as to make necessary expense payments and to acquire the necessary assets. However some of the

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liquidity also appears on the balance sheet of firms as cash for the payment of unexpected expenses.

Different factors for holding liquidity are set apart by different policies regarding capital structure, requirements of working capital, management of cash flow, investment and asset management. Apart from the above mentioned factors there are some more factors that affect the cash holding. Dittremental et al. (2003) examine a sample comprising of 11000 firms collected from 45 different countries came up with a conclusion that in such countries where( the rights of shareholders are not well protected, such firms hold double the amount as compared to those shareholders of the firms where shareholders rights protection is high. Keeping in mind the different motives of holding cash and cash equivalents the managers have to decide about the optimum level of liquidity which they have to maintain.

Holding liquid assets is one of the utmost important considerations of every non-financial firm (see for example, Ferreira and Vilela (2004), Myer and Majluf(1987)). There are different factors identified by the existing literature as important determinants of cash holdings. However, there is lack of consensus among the researchers about the factors that affect the cash holdings, which justify the need for more research on this issue. Further the issue has largely been examined in the developed country context, while there is limited literature available on developing countries. Moreover, the effect of the global financial crisis on liquidity has been ignored in developed as well as in the developing countries' context. This clearly shows a gap in the existing literature. Therefore, the purpose of this research is to bridge this space in the existing literature by focusing on the factors affecting cash holdings of non-financial firms of Pakistan listed on KSE 100 index.

#### **Literature Review**

Cash and cash holdings have remained the focus of many researches for many years. Existing literature has mainly focused on industrial level analysis of cash holding firms that why and how much cash should they hold and what are the determinants of this. The chronological method is being used for Literature Review.

A perfect market situation is discussed by many authors regarding financing one such discussion is taken here. In case of perfect market the cost financing is not an issues as cost advantage does not prevails in such market (Miller and Modigliani,1958). However, the reality differs from this ideal situation of perfect market as the markets are always imperfect due to asymmetric information and cost of issuing equity and debt also differs. Keeping in mind the imperfect market and

cost associated with issuing of debt and equity there is a need for holding cash in order to benefit from future investments.

Nadiri(1969) took manufacturing firms of US in order to find out their need and determinants of their cash balances. The researcher used quarterly data for the period of 1948—1964.He came up with the evidence that output i.e wealth, factor prices, interest rate and change expected in general price level decides about the liquidity needs. He concluded that the mentioned factors should be considered while deciding about the amount of liquidity to hold. There should also be some motivation for holding liquidity despite of the mentioned factors by Nadiri (1969)

There are different motives for holding cash and cash equivalents. According to Jensen and Meckling (1976) one of the reasons for which managers hold cash is to restrain external pressure when the managers are the owners of the company. Shareholders would try to hold maximum cash rather than issuing equity as issuing equity will bring more owners. Managers and shareholders motives of holding equity differs from one another.

According to the study of Myers (1984) about 62% of the capital expenditures also including investment in short term assets and inventory, were all financed from internal sources of financing that is the internally generated cash. Therefore, the author concludes that the utmost priority of any firm is to opt for internal financing and then should opt for debt financing. Due to the mentioned reason companies hold cash and marketable securities in order to exploit future opportunities with minimum financing costs.

Kester (1986) studied US and Japanese firms for the purpose to study their behavior regarding liquidity management. According to his findings U.S firms hold about 8.6% of total asset as cash while cash holdings by Japanese firms is more cash as compared to US firms, which on average holds 18.7%. This striking difference in cash holding behavior of the two different firms of different nations is well explained by Pinkowitz and Williamson (2001). According to their findings one reason could be the monopolistic power of Japanese banks and that's the reason that banks in Japan hold more cash for future. Another reason which they identified was the sound and good corporate governance of the U.S. Due to good corporate governance the shareholders rights in U.S are well protected and for the mentioned reason U.S firms hold minimum amount of cash.

For maintaining cash reserves Jensen (1986) used agency theory. Due to his findings if the managers are tightly controlled, they would be more conscious of retaining free cash rather than making misuse of it. As

a result it would create buffer stocks that could be best utilized in time of financial constraint. Poor managerial decisions always lead toward more costs. In such cases idle cash kept is used to cover the losses occurred due to poor managerial decisions. Large amount of cash flows are held by firms having more volatile cash flows and market to book ratio (Kim et al.,1986). Liquidity shows an indirect relation with financial distress, size, debt and cash conversion cycle (Kim *et al.*, 1998 and Opler et al. 1999).

Anjum and Malik(2013) selected 345 non-financial firms for a period of 2005-2012. All the selected firms are listed on kse100 index. Their analysis shows a direction relation of size with cash holdings. It also shows a positive relation of cash holdings with networking capital. While the relation between cash holding and leverage is reported negative.

Opler et al.(1999) studied sample of US firms of manufacturing for a time period from 1971 to1994 in order to find out the factors effecting liquidity as well as marketable securities. They also investigated the changing behavior of firms regarding liquidity. They also concluded that trade off theory was modified by the managers for the reason to maximize shareholder's wealth and holding more cash than expected.

The findings of Opler's (1999) model showed that the firms which were risk takers had more opportunities for growth and firms of smaller size held more cash than others. The reason of larger firms to retain less cash is the maximum access of such firms to capital markets as well as their good credit ratings. The main reason for which the firms maintain liquid assets is the volatility of cash flows and the high costs associated with getting external funds.

Hardford (1999) found that in US the regulations were strict and as a result the shareholders were at a safer side even though managers held more liquidity. Consequently it shattered their future investments opportunities which could give higher returns. For such reason when markets are controlled or near perfection managers go for investment rather than holding cash.

According to the findings of Almeida, Campello and Weisbach(2002) financially restricted firms hold more cash for the reason that the cost of raising external funds is expensive for financially constraint firms as compared to non-financially restricted firms which hold less cash as raising external funds is not that expensive for them as financially constraint firms.

A sample of 1029 firms of UK for the period of 1984-1999 was taken by Ozkan and Ozkan (2004). The main focus of Ozkan was on the

relation of liquidity with managerial ownership. However interest of both shareholders and managers can be best parallel if the managerial ownership is greater. Ozkan came up with the findings that one of the factors affecting cash holdings in firms of UK is their structure of ownership. There was a consistent relationship between the two i.e cash holdings and managerial ownership. The author also concludes that family owned firms hold more liquidity. He found that cash holding is inversely related with bank debt, leverage and liquid assets while it is directly proportional to growth opportunities and cash flows.

There are different intentions for holding cash and cash equivalents. Dittma *et al.*,(2003) identified asymmetric information as one of the motives for holding liquidity. Due to insufficient information future demand is hard to predict, therefore more cash is held.

From study conducted on a sample of firms working in the EMU countries, it was concluded that cash holdings show a positive relationship with investment opportunity and negative relationship with leverage and the amount of liquid asset substitute. These results of the study are in accordance with the tradeoff model that is that firms hold liquidity by doing marginal cost benefit analysis and in turn the pecking order theory is justified (Ferreria and Vilela 2004). However the results contradicted with the free cash flow theory. An inverse relation between cash holdings and investment opportunities set indicated an agency problem having a conflict between the shareholders and the managers which lead towards the conclusion that shareholders does not affect the liquidity.

A study on a sample of those companies is studied by Hatzell *et al.*,(2007) over a time period from 1984-2003. The sample of the firm selected were having \$100 million cash. The relationship between tax payments by MNC's and cash holdings is studied. In the same study other variables affecting liquidity requirements of firms are also thought out. The study is consistent with the two theories of liquidity i-e precautionary motive and the transaction motive. The author found that leverage and cash holdings are negatively correlated. They also concluded that firms with uncertain cash flows prove the transaction cost motive.

Summarizing the quoted literature the outcome accomplished is that although much work is done in developed countries such as US and UK on the topic under study however the results obtained are inconsistent. Similarly the work done on the mentioned topic in developing countries also show mixed results. From the above discussion it is concluded that none of the results are unanimous. It is also obvious that the results of developed countries are also not generalizable to

developing countries. The basic reasons for non-generalization to developing countries are; the difference in political systems, corporate governance and international financial reporting standards. From the existing literature to the best of my knowledge none of the researchers have considered the GFC as one of the factors effecting cash holding. This all discussion justifies the need for further research.

**Methodology:**

*Sample and Sampling Technique:*

A sample of 411 firms is initially taken that are listed at Karachi Stock Exchange (KSE). The time period taken is from 2005 to 2012. The financial firms are excluded for the obvious reason that cash requirement for financial firms is different from that of non-financial firms (Afza, Talat and Sh. Muhammad Adnan, 2007)

The utility sector firms, fuel and energy sector firms and information, communication and transport sector firms are not included in the sample for the reason that they might be under government regulations and their cash needs may be different from the rest of the sample. Afza, Talat and Sh. Muhammad Adnan (2007). Finally we were left with the sample of 349 companies only.

*Sources of data:*

All the data is collected from secondary sources. Data is extracted from the balance sheet analysis of non-financial listed firms which is published by State Bank of Pakistan for the time period of 2005 to 2012.

*Variables:*

The independent variables used in this study for evaluation of the firms to evaluate its level of cash holdings are liquidity requirements *i.e* capital employed, size of the firm, leverage, cash flow and the global financial crisis. While studying the relationship of cash holdings with these variables the behavior of each is examined under the three theoretical models of cash holdings, namely, the free cash flow theory, the tradeoff theory and the pecking order theory. Variables taken in the research are defined as explained in Opler et.al (1999). The formulas used in this paper are also used by Talat Afza in his research, (Afza Talat and Adnan, 2007).

*Cash:*

The definition of cash is in terms of cash ration which is calculated as cash and cash equivalent to net asset. Net asset in turn is equal to total assets minus cash and cash equivalents (Dittmar and Servaes, 2003). CASH is the dependent variable and is represented by the cash ratio (Opler, 1999; Ferreira and Vilela, 2004)

CASH is the response variable and is given by the cash ratio;

$$\text{CASH} = \frac{\text{Cash and Cash Equivalent s}}{\text{Book value of assets - Cash and Cash Equivalent s}}$$

*CPTLEMP:*

For the investment opportunity set capital employed (CPTEMPL) is taken as a proxy. It is calculated by summing up Shareholder's equity and noncurrent liabilities. CPTLEMP is calculated by adding the sum of Debt, book value of common stock as well as preferred stock. (Kaplan and Zingales, 1997). The definition is taken from the site of state bank of Pakistan. Capital employed basically adds to the company's ability to raise revenue.

$$\text{Total capital employed} = \text{Shareholder's equity} + \text{Long term secured loan} + \text{Long term unsecured loan} + \text{Debentures/ TFC's} + \text{Employees benefit obligations.}$$

Capital employed is taken as a proxy for the firm's investment opportunity set. Capital employed is the value of the assets that contribute to a company's ability to generate revenue.

*Size:*

Natural log of total assets is used to calculate size (SIZE) of firms. Kim et al (2006). The importance of Size can never be ignored in capital structure (Booth et al, 2001; Amidu, 2007; Abor and Biekpe, 2006; Abor and Biekpe, 2009;).

*CF:*

Cash flow (CF) is measured by cash flow to net assets ratio (Opler, 1999; Ferreira and Vilela, 2004)

$$\text{CF} = \frac{\text{After tax profit} + \text{depreciation}}{\text{Total Assets - Cash and Cash Equivalent}}$$

*NWC:*

Net working capital (NWC) is used to measure the short-term liquidity of a business. The measurement can also be used to obtain a general impression of the ability of company management to utilize assets in an efficient manner. The following formula is used by Sohani Islam (2012); Afza and Adnan (2007)

$$\text{NWC} = \frac{\text{Net current assets} - \text{Cash and cash equivalents}}{\text{Total assets} - \text{cash and equivalents}}$$

*LVRG:*

Following existing literature (Opler, 1999; Afza and Adnan, 2007; Ozkan and Ozkan, 2004; M. Bigelli and Vida, 2012; Mello et al, 2008) leverage is measured by the following formula .

Leverage (LVRG) is measured as;

$$\text{LVRG} = \frac{\text{Total Debt}}{\text{Total Assets} - \text{Cash and Cash Equivalent}}$$

*Model:*

The model used is similar in spirit to the model of Opler et al. (1999). According to Opler's model cash holdings is the function of riskiness of cash flows, growth opportunity, and the cost of raising assets through dividend cuts and asset sales and the access to dividend cuts. Some of the variables used by Opler (1999) like the R and D (research and development) expenditure, capital expenditures and the regulatory dummy are excluded because the data for these variables is not available in Pakistan.

For a firm *i* in the year *t*, the cash model is given by the following equation

$$\text{CASH} = \alpha + \beta_1 \text{CPTLEMP} + \beta_2 \text{SIZE} + \beta_3 \text{CF} + \beta_4 \text{NWC} + \beta_5 \text{LEVERAGE} + \beta_6 \text{GFC} + \epsilon_1$$

### Results and Conclusion

The purpose of the research is to find out the factors affecting cash holdings of non-financial firms of Pakistan listed on KSE 100 index. A global financial crisis of 2007 is also the focus of the study to find out its impact on selected firms. A simple panel regression is used and results obtained are given below.

| Variable          | Coefficient | Std. Error | t-Statistic | Prob. |
|-------------------|-------------|------------|-------------|-------|
| C                 | 0.912       | 0.384      | 2.374       | 0.017 |
| CF                | -0.242      | 0.006      | -36.906     | 5.984 |
| SZ                | -0.132      | 0.063      | -2.090      | 0.036 |
| CE                | 1.328       | 7.564      | 1.755       | 0.079 |
| NWC               | -0.154      | 0.005      | -25.744     | 2.498 |
| LEV               | 0.053       | 0.002      | 21.308      | 5.776 |
| GFC               | -0.107      | 0.094      | -1.136      | 0.255 |
| R-squared         | 0.652       |            |             |       |
| F-statistic       | 808.69      |            |             |       |
| Prob(F-statistic) | 0           |            |             |       |

The results reported in table 1 reveal that leverage has positive coefficient and is highly statistically significant (i-e at the level of 1%). The positive coefficient reveals that leverage has positive impact on cash holding. It means that high levered firms hold more cash. However the result is in consistent with the existing literature as most of the researchers came up with negative relation such as Hatzellet al.,(2007), FerreiraandVilela(2004) Ozkan and Ozkan(2004), Anjum and Malik (2013) and Kim *et al.*,(1986). One of the reasons of this inconsistency might be that none of the cited authors have considered the global financial crisis of 2007. From the above quoted researchers it is clear that

the majority of the study is conducted on developed countries that might be another reason for the inconsistency of the result.

Table 1 shows that coefficient of capital employed is positive and insignificant. As the result is insignificant so it cannot be statistically concluded. Although the positive relation might indicate that the managers hold internal cash balances and invest them whenever there is a good opportunity for investment. It is clear from the above table that networking capital depicts a positive relation with liquidity and the statistical result reveals that it has a highly significant impact on cash holding. It is in support of trade off theory, which means that firms hold cash on their balance sheet after cost benefit analysis.

Size exhibits a negative relation with dependent variable. It supports the tradeoff model while it is in contraction with pecking order theory and free cash flow theory. The negative relation of size with cash holdings is also supported by Ferreira and Vilela (2003) and Opler *et al.*, (1999) while Anjum and Malik (2013) negated the inverse relation. This shows that small firms hold more cash where as large firms had less cash balance because they have more access to the capital markets and can get loan easily when they need funds from outside.

The coefficient of cash flow is negative and is highly significant it supports the tradeoff theory. From the obtained results it is assumed that firms keep more cash in order to prevent the company from financial distress. The same result is reported by earlier researchers for the developed countries (see for example Opler *et al.*, (1999), Ozkan and Ozkan (2004) and Ferreira and Vilela (2004)). However the results are negated by pecking order theory.

GFC shows negative relation and is not significant. From the obtained result it is concluded that the global financial crisis of 2007 has no direct impact on the cash holding of the non-financial listed firms Pakistan. The value of F obtained is 18.73 as it is above 18.73 that is above the level of significance which is 4, it clearly suggests the overall model is significant. While the value of R square is 0.742 which in other words mean that 74% variation in the dependent variable is explained by the independent variables. From the above result it is concluded that more than 50% of variation in the dependent variable is due to the dependent variables.

As the data used is panel, so, the existing literature suggests either to run fixed effect regression or random effect regression. For the said reason Hausman Specification Test (1978) is done in order to know whether fixed effect model is suitable for the data or random effect model. The result of the test is stated in table 2 below. The result

obtained divulges that fixed effect model should be used for further analysis of the data.

**Table 2**

| <b>Hausman Test</b>  |                   |              |       |
|----------------------|-------------------|--------------|-------|
| Test Summary         | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
| E                    |                   |              |       |
| Cross-section random | 272.482           | 6            | 0     |

After running fixed effect model the results attained are reported in table 3 below.

**Table 3: determinants of cash holdings using fixed effect model**

| Variable            | Coefficient | Std. Error | t-Statistic | Prob. |
|---------------------|-------------|------------|-------------|-------|
| C                   | 1.842       | 0.609      | 3.021       | 0.002 |
| CF                  | -0.188      | 0.007      | -26.688     | 0.00  |
| CE                  | 1.37        | 1.22       | 1.122       | 0.261 |
| LEV                 | 0.061       | 0.003      | 19.598      | 0.00  |
| NWC                 | -0.129      | 0.005      | -21.951     | 0.00  |
| SZ                  | -0.287      | 0.100      | -2.845      | 0.004 |
| GFC                 | -0.100      | 0.087      | -1.145      | 0.252 |
| R-squared           | 0.742433    |            |             |       |
| No. of Observations | 2596        |            |             |       |
| F-statistic         | 18.73619    |            |             |       |
| Prob(F-statistic)   | 0.000000    |            |             |       |

### **Conclusion**

The study empirically investigated the determinants of cash and cash equivalents among the non-financial firms listed on KSE100 index from time period of 2005 to 2012. The study is approached through the previous literature in two ways. First the discussion in literature is about the capital structure theories and then panel data is considered to find out the variables that determine cash holdings of non-financial Pakistani firms. Panel regression is used for the analysis of the 349 selected companies listed on kse100 index. The three important theories of corporate cash holdings i.e Pecking order theory, trade off theory and free cash flow theory were used to analyze the behavior of the these variables on the firms' liquidity.

Result of regression reveals that cash flow; leverage, net working capital and size are significant, signaling the level of cash and cash equivalents of firms of Pakistan. Whereas global financial crisis and capital employed are exhibiting insignificant behavior. The findings of the research suggest that capital employed and leverage is positively co related while cash flow, net working capital, size and global financial crisis are negatively co related.

This study contributes to the existing literature in many important dimensions. First of all it is well tried to fill in the gap in the existing literature. Secondly, most of the work done on the topic under discussion is done in the developed countries while the focus of this study is a developing country that is Pakistan. Another contribution is that to the best of the author's contribution no one has considered Global Financial Crisis as one of the determinants of cash holdings and it is covered in this paper.

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