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# The Relationship between Liquidity and Firms' Profitability: A Case Study of Karachi Stock Exchange

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**Abstract**

The purpose of this paper is to investigate the relationship between firm's liquidity and profitability; and to find out the effects of different components of liquidity on firms' profitability.The relationship between liquidity and firms' profitability is empirically examined by collecting the data of 50 listed firms of Karachi Stock Exchange, Pakistan. Panel data has been collected from secondary sources for the year 2007 to 2011 .Net operating income and Return on assets are used measure of firm's profitability. Liquidity of the firm is measured by using cash gap in days and current ratio. Firm size measured by net sales, total assets and market capitalization .The study applies regression analysis to determine factors affecting profitability. Incremental tests are carried out to see the importance of individual variables in the model.The results of correlation and regression analysis showed that there is a significant negative relationship between cash gap and return on assets while current ratio has significant positive relationship with profitability. Results further indicate that log of sales and log of total assets has positive significant relationship with profitability. The findings of this study are based on firms listed on the Karachi Stock Exchange (KSE). Hence, the results cannot be generalizable to those firms which are not listed on Karachi stock exchange. The sample of the study comprises only the merchandising and manufacturing firms. Banks are excluded due to their nature of work.

**Keywords:** Liquidity management; profitability; current ratio; cash gap; Return on assets; Total assets.

## 1. Introduction

Liquidity management is important for every firm as it virtually affects its overall liquidity and profitability (Appuhami, 2008). Firms involved in the processing of goods (manufacturing companies), usually keep working capital in the form of the cash, marketable securities, cash equivalents and the inventories. The working capital comprises almost half of the sum of the asset side of the balance sheet, whereas this proportion may be higher in the case of firms involved in the business of trading these products (merchandising companies). The excessive amount of investment in these assets may result in the barrier of the company's precious cash resources and eventually profit of firms may decline.

There is always tradeoff between liquidity and profitability (Eljelly, 2004). Liquidity and profitability are important goals for any firm and to sacrifice one goal at the cost of other can create severe problems for the firm (Kargar and Bluementhal, 1994).Profitability is important for long term survival of firms which helps to maximize the wealth of shareholders. On the other hand liquidity is important to cover its short term obligations like payment to supplier and to protect itself from bankruptcy (Howorth and Westhead, 2003, Deloof, 2003, Afza and Nazir, 2007,Afza and Nazir, 2008)Liquidity Management requires a careful attention since it plays a major role in firms effectiveness, value and risk (Smith, 1980).

Large inventory and a substantial trade credit policy may lead to high sales. Firms kept larger inventory to reduce the risk of a stock out. Trade credit may arouse sales because it allows customers to assess product quality before paying (Long, Maltiz & Ravid 1993). Liquidity is concerned with making sure that firms have exactly the right amount of money and lines of credit available to the business at all times. A popular measure of liquidity is cash gap or cash conversion cycle, the time lag between the expenditure for the purchases of raw materials and the collection of sales of finished goods (Deloof, 2003). The longer this time lag, the larger the investment in working capital. A longer cash gap might increase profitability because it leads to increase in sales of companies. However, corporate profitability might also decrease with the cash gap.

A firm is required to maintain a balance between liquidity and profitability for the sake of its short term obligations. Liquidity is a prerequisite to ensure that firms are able to pay its short term debt and its continued flow can be guaranteed from a profitable business enterprise. Liquidity for the ongoing firm is not dependent on the liquidation value of its assets, but also depends on the operating cash flows generated by those assets of firms (Soenen, 1993).

Brigham and Ehrhardt (2005: 745 ) define cash gap as "nets out the three periods just defined and which therefore equals the length of time between the firm's actual cash gap expenditures to pay for productive resources (materials and labor) and its own cash receipts from the sale of products (that is, the length of time between paying for labor and materials and collecting on receivables)." working capital management basically cover the planning and controlling activities of the firms regarding their current assets and current liabilities in a manner that guarantees their ability to meet their current obligations satisfactorily as well as a maximum return on their precious investment in these revolving assets (Eljelly, 2004).

Efficient management of liquidity is a fundamental part of the overall corporate strategy to maximize the wealth of shareholders. Firms try to keep an optimal level of liquidity that maximizes their value (Howorth and Westhead, 2003; Deloof, 2003; Afza and Nazir, 2007). According to Chief Financial Officer (CFO), liquidity management a simple and straightforward concept of ensuring the ability of the organization to fund the difference between the current assets and current liabilities (Harris, 2005). However, a "Total approach should be followed which cover all the company's activities relating to customer, supplier and product" (Hall, 2002).

The overall objective of this study is to investigate the relationship between liquidity and profitability of firms in Pakistan and to find out the effects of different components of liquidity on profitability of firms.

## 2. Literature Review

Liquidity is an important issue in financial decision making. It includes investment in asset that requires appropriate financing investment. However, liquidity issues are usually neglected by the firms in financial decision making as it involves investment and financing in the short term period. If firms have good relationships with their trade creditors, they might be able to solicit their help in providing short term working capital. Samiloglu and Demirgunes (2008) defined that liquidity management in literature is simple and a straightforward concept that ensures the ability of the organization to fund the difference between the current assets and current liabilities.

Muhammad *etal.,* (2015) analyzed the impact of working capital management on the profitability of seven firms listed on the Nigerian Stock Exchange over the periods of 2008 to 2012. They found that Current Ratio (CR),the size of the firm (LOGSIZE) and Average Collection Period (ACP)is positively influenced with profitability, while Inventory Turnover Period (ITP), Average Payment Period (APP) has shown negative relationship. The paper therefore endorses that idle funds or excessive liquidity lead to less profitability. It has been suggested that in order to raise profit cash collected should be re-invested into short-term investment.

Delavar*etal.*,(2015)empirically investigated the relationship between company performance and working capital management of 71companies listed at Tehran Stock Exchange. Data has been collected from annual reports of firms for the period 2004 to 2012. Tobin's Q-ratio has been used to measure firm performance. The results indicate that there is no significant relationship between working capital management and firm performance. The result further implies that the relationship between working capital management and financial performance of companies has not been influenced by financial constraints.

Eljelly (2004) explicated that efficient liquidity management comprises planning and controlling of current assets and current liabilities in such a manner which helps organizations to meet its current obligations as well as avoid excessive investment in these assets .The relation between profitability and liquidity was examined on a sample of 29 joint stock companies in Saudi Arabia as measured by current ratio and cash gap (cash conversion cycle)

by using correlation and regression analysis. The study found that dynamic approach (cash gap) of liquidity was of more important as compare to static approach (current ratio) that affects profitability. The size variables (total assets & sales growth) were found to have significant effect on profitability at the industry level. Deloof (2003) examined the relationship between working capital management and firm profitability by using CCC as a measure of working capital management on a sample of 1009 large Belgian non-financial firms for the years 1992-1996. A statistically significant negative relationship has been found between the number of days accounts receivable, inventories and accounts payable and gross operating income .The findings suggests that by reducing the number of day's accounts receivable and inventories to a reasonable minimum, the managers can maximize the shareholder's wealth. Lazaridis and Tryfonidis (2006) analysed 131 companies listed at Athens Stock Exchange for the period 2001 -2004. They found a negative relationship between CCC and profitability. The Garcia-Teruel and Martinez-Solano (2007) studied the relationship between profitability and CCC for small and medium sized firms from Spain and Zariyawati et al. (2009) investigated Malaysian firms for the period 1996-2006. The results of both studies found consistent with the aforementioned studies.

Padachi (2006) examined the impact of trends in liquidity management on firm performance for the sample of 58 Mauritian small manufacturing firms, his findings exposed that firm is required to retain stability between liquidity and profitability while conducting its day to day operations. The study also asserts that liquidity ensure firms ability to meet its short-term obligations. The results also declare that nonstop flow of liquidity can be guaranteed from the profitable ventures of a firm. Alipour (2011) examined the sample of 1063 firms listed at Tehran stock exchange. His studies revealed a negative association between profitability and Inventory Turnover, cash conversion cycle, number of day's accounts receivable whereas a positive significant relationship with noofdays accounts payables. He argued the profitability of the firms has been significantly influenced by working capital management.

Raheman and Nasr (2007) studied the effect of components of working capital management on liquidity and profitability in Pakistan. They conducted their study on 94 firms listed on Karachi stock exchange for the period of 1999-2004. Their findings showed a significant negative correlation between working capital management components and profitability. Furthermore, they also reported the same relationship between liquidity and profitability.

Anser and Malik (2013) analyzed the effect of cash conversion cycle on profitability of firms in the manufacturing sector of Pakistan for the year 2007 to 2011. The dependent variables of the study were return on assets and return on equity and cash conversion cycle was used as an independent variable in the study. The findings of the study show that there exists an inverse relationship between cash conversion cycle and measures of firm profitability. The authors suggest that lesser cash conversion cycles are favorable for manufacturing sector in Pakistan. In another study, Majeedetal., (2013) also finds a negative relationship between cash conversion cycle and measures of firm performance which includes return on assets, return on equity and EBIT in Pakistan.

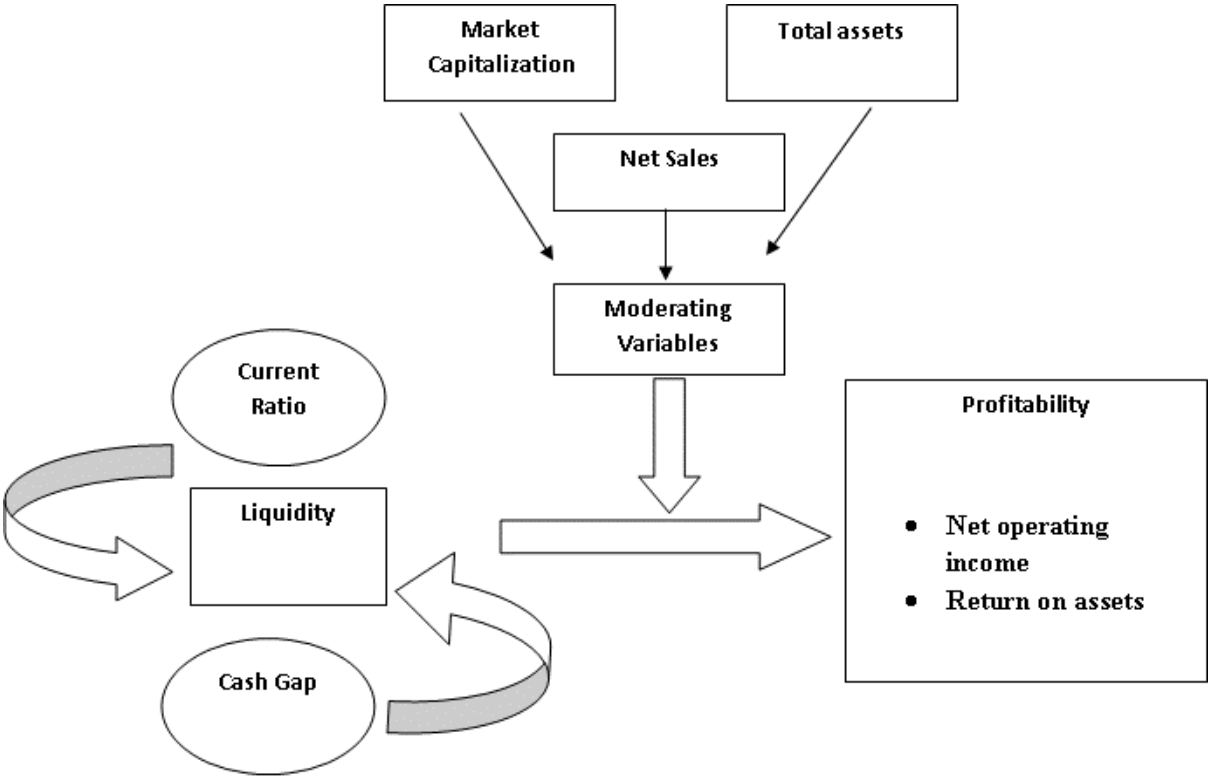
Afza and Nazir (2009) also studied the association between working capital management practices and a firm's profitability. A sample selected by them was 204 non-financial firms listed on KSE for years 1998-2005. They found a strong positive association of low profitability and aggressive working capital management. Their study recommends a conservative approach towards working capital management in Pakistan. Zuberi (2010) took a sample of Pakistan's automobile sector and find that the growth and current ratio of the firms in automobile sector have direct relation with the profitability of the firms. In Pakistan there have been few researches on working capital management. Sana and Shah (2006) worked on oil and gas sector. They took a very small sample of consisting only seven firms and they concluded that profitability and value of shareholders can be increased by managing the working capital efficiently.

Usama (2012) also investigated the impact of liquidity and profitability on firms in the food sector of Pakistan for the time period of 2006 to 2010. The findings of his study reveal that the management of working capital has a significant positive influence on profitability as well as liquidity of firms. The study conducted by Malik and Bukhari (2014) on Pakistani firms also shows significant positive association between cash conversion cycle and return on equity.

## 3. Data and Methodology

The sample in this study includes 50 listed firms of Karachi stock exchange. The sample comprises merchandising and manufacturing firms from twelve sectors (i.e. food, cement, automobile, engineering chemicals, textile, electricity, fixed line telecommunication health, travel and oil and gas). Data collected from secondary sources. The analysis is based on information from annual reports over the five year from 2007 to 2011.The effect of liquidity on profitability is tested using the panel data methodology.

Based on the literature, conceptual framework has been designed to study the relationship between liquidity and profitability of different firms of KSE. There are seven variables, with two profitability measures (net operating income and return on assets) and five independent variables (cash gap in days, current ratio, net sales, total assets and market capitalization).




Source: Based onEljelly (2004)

Figure 1. Conceptual Framework

Static view uses the traditional ratios calculated from balance sheet such as current and quick ratios for analyzing the liquidity management and financial policies. While a dynamic measure of liquidity Cash Conversion cycle is used that measure cash outflow and cash inflow in days for a given period of time. Market capitalization, net sales and total assets are moderating variables in a model which influence the impact of liquidity on profitability. Two dependent variables used as proxy variables of profitability i.e.net operating income and return on assets.

Study assumes that there may be a relationship between profitability of the company and its liquidity, as a result of savings or external financing costs. Due to presence of these elements of costs and cost savings, this relationship between profitability and liquidity is most likely be negative. Consequently, first hypotheses of this study can be stated as follows:

***There is a negative relationship between liquidity of a firms and its profitability.***

Profitability may be a function of the size of firms which are measured in terms of total assets and sales. The company size may affect liquidity, cash gaps and profitability in different ways. Large firms purchase inventory in large quantities in order to get quantity discounts. Further, large firms may qualify for quantity discounts from suppliers due to their size. On the other hand, large firms also able to get favorable credit terms from their suppliers in terms of longer credit periods. Moreover, large firms may have more success in their receivables collection efforts relative to small companies. All these factors may push liquidity levels and cash gaps of large firms to levels lower than that of small companies.

***There is a positive relationship between the firm's size and its profitability***

## 4. Empirical Modeling

The basic regression equation of study is as follows:

$$NOI = B0+B_1CR+B_2CGS+B_3LOGS+e \quad (1)$$

(Eljelly, 2004)

Where NOI is net operating income, CR is current ratio, CGS is cash gap in days and LOGS is log of net sales. More specifically equations estimated are:

$$NOI = \beta_0 + \beta_1 (CR) + \beta_2 (CGS) + \beta_3 (MC) + \beta_4 (LOGS) + \beta_5 (LOGTA) + \varepsilon \quad (2)$$

$$ROA = \beta_0 + \beta_1 (CR) + \beta_2 (CGS) + \beta_3 (MC) + \beta_4 (LOGS) + \beta_5 (LOGTA) + \varepsilon \quad (3)$$

## 5. Result and analysis

### *5.1. Descriptive analysis*

Descriptive analysis helps to describe relevant aspects and provide information about each relevant variable. These results are summarized in the following table 2.

Table 2. Descriptive Statistics

| | NOI | ROA | ROE | CG | CR | MC | Sales | TA |
|---|---|---|---|---|---|---|---|---|
| **Mean** | 0.008 | 6.64 | 24.20 | 13.248 | 1.44 | 2.10 | 0.063 | 0.11 |
| **Median** | .0001 | 4.74 | 16.34 | 4.424 | 1.08 | 0.766 | 0.003 | 0.002 |
| **Maximum** | 1.11 | 51.57 | 2788.20 | 270.5 | 6.87 | 24.7 | 15.2 | 3.92 |
| **Minimum** | -.154 | -36.49 | -1290.33 | 0.00 | 0.10 | 0.004 | .0001 | .000 |
| **Std. Dev.** | 0.074 | 11.46 | 207.36 | 30.42 | 1.06 | 3.66 | 0.201 | 0.498 |

Table 2 shows the result of descriptive statistics for 50 non-financial firms for a period of five years from 2007 to 2011. Net operating income, return on assets and return on equity used as proxy variable for measuring firm's profitability. Mean value of NOI is Rs.0.008 billion which shows the firms average profit after taxation. Average value ROA is 6.64 with standard deviation 11.46.The mean for dependent variable ROE is 24.20, the standard deviation is 207 which is higher as compare to ROA; it shows values are not close to mean due to different pattern of investment and capital structure of different firms.

Mean value of Cash Gap in days is 13.24 days and its standard deviation is 30.24 days, it means firms average length of time between actual cash expenditures on productive resources and actual cash receipts from the sale of products or services is 13 days.

Current ratio is a traditional tool use for measuring the liquidity. The average value of CR is 1.44 and standard deviation is 1.06.The highest value of current ratio for a company in a particular year is 6.87 and the minimum value for a year is 0.10.

Market Capitalization is moderating variable which is used for measuring the size of firms. Average value of mean is Rs. 2.10 billion and its deviation from its mean is 3.66. Sales and total asset are also used as moderating variables in the study. Sales and total assets are used as proxy variables for measuring the size of firms. Mean value of sales is Rs.0.063 billion and standard deviation is 0.201. While mean of total assets is Rs.0.11 billion and standard deviation is 0.498.

### *5.2. Correlation Results*

Table 3. Correlation

| | CR | Sales | CGS | MC | TA | NOI | ROA |
|---|---|---|---|---|---|---|---|
| **CR** | 1 | -.014 | -.083 | -.039 | -.061 | .100 | .090 |
| | | (.825) | (.192) | (.537) | (.333) | (.116) | (.155) |
| **Sales** | | 1 | -.116 | .114 | .911** | .231** | .143* |
| | | | (.067) | (.072) | (.000) | (.000) | (.024) |
| **CGS** | | | 1 | -.345** | -.145* | .005 | -.047 |
| | | | | ( .000) | (.022) | (.938) | (.459) |
| **MC** | | | | 1 | .117 | .003 | .125* |
| | | | | | (.064) | ( .961) | (.048) |
| **TA** | | | | | 1 | .305** | -.011 |
| | | | | | | (.000) | .(868) |
| **NOI** | | | | | | 1 | .119 |
| | | | | | | | (.061) |
| **ROA** | | | | | | | 1 |

** Correlation is significant at the .0 l level (2-tailed)

* Correlation is significant at the .05 level (2-tailed)

Table 3 shows correlation analysis for return on assets and net operating income. Return on assets has weak positive relationship with current ratio. The log of sales has a positive relation with the profitability of the firm. It implies that the size is associated with increase in the performance of firm. In the same way sales growth is also associated with increase in the profitability of the firm because increase in sales is associated with increase in profits. The results indicated that there is insignificant negative correlation between the cash gap and return on assets. The firms with shorter cash gap are more likely to be more profitable than the firms with longer cash gap. A probable explanation to this finding is that when the cash gap is relatively shorter, the firm does not need external financing, which results in incurring less borrowing cost. Hence, profitability increases. Return on assets has positive significant relationship with market capitalization which shows that volume of shares are increase the income of shareholder which leads increase in return on assets while negative relationship found with total assets.

Net operating income is positively correlated with current ratio .Log of sales and log of total assets have positive significant relationship with net operating income which indicates that as

the size of firms increases in term of sales and assets net operating income also increases in same direction and vice versa. Cash gap in days and market capitalization has weak positive association with net operating income.

Log of sales and log of total assets have strong positive significant relationship which illustrate that these two variables are substitute measures of size. Cash gap has negative significant relationship with market capitalization and total assets which demonstrate that as length between actual cash expenditures and cash receipts decreases firms' performance will increase.

### *5.3. Regressions analysis*

Table 4. Multiple regression analysis for net operating income

| | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| **C** | -1.79E+09 | 3.78E+08 | -4.726277 | 0.0000 |
| **CGS** | 45927095 | 44410686 | 1.034145 | 0.3021 |
| **CR** | 96619490 | 42501271 | 2.273332 | 0.0239 |
| **MC** | -8.74E-05 | 0.001304 | -0.067030 | 0.9466 |
| **Sales** | -1.07E+08 | 49779412 | -2.144693 | 0.0330 |
| **TA** | 2.06E+08 | 49624137 | 4.147002 | 0.0000 |
| **R-squared** | | 0.127317 | | |
| **Adjusted $R^2$** | | 0.109434 | | |
| **Durbin-Watson** | | 1.784227 | | |
| **F-statistic** | | 7.119484 | | |
| **Prob(F-statistic)** | | 0.000003 | | |

Table 4 shows multiple regression analysis of independent variables and control variables on dependent variable i.e., net operating income used as proxy of profitability.

The coefficient of the current ratio variable is positive and significant, implies that an increase in the current ratio by 1 unit is associated with an increase in net operating income 96619490 unit. Significant positive coefficient of current ratio shows that as firms improve in managing their short term obligations it has positive impact on the firm's profitability. The results are contradicted with (Rehaman and Nasar, 2007) who found negative significant relationship between current ratio and profitability. This finding rejects the hypothesis ($H_1$) that there is negative relationship between current liquidity and profitability.

The natural logarithm of sales is used for size in the regression model as this log transformation reduces the hetroskedasticity and influences of outliers in the regression model. Coefficient of CR is positive while coefficient of Cash gap is a negative, but are insignificant and so is LOGS. This indicates that when liquidity levels are low, denoted by insignificant cash gap, the effect on profitability is not significant. This effect is multiplied when the company size is large, evidenced by the significant negative coefficients of LOGS. Results are consistent with Eljelly (2004).

Total assets has positive coefficient and highly significant which shows that total assets has great significance in firm's profitability. Size is positively related to profitability and is significant which suggests that larger size seems to favor the generation of profitability therefore larger firms are more profitable. Results indicate that 1% change in total assets leads to 2.6% unit change in profitability of firms. This finding support ($H_{2)}$ that there exists a positive relation between the company size and its profitability.

The value of F statistics is 7.11 which are significant endorsing the validity and stability of the model relevant for the study. The value of Durbin-Watson is near about 2 which show that there is not a problem of autocorrelation exits among independent variables.

Table 5 shows multiple regression analysis with dependent variable return on assets. The results shows that R square of model is .15 for return on asset which endorse that only 15% variation are explained by the explanatory variables of models The value of F statistics is 7.43 being significant. The value of Durbin-Watson is 1.77 which shows that autocorrelation problem does not exist among independent variables.

Table 5. Multiple regression analysis for return on assets

| | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| **C** | -6.951407 | 11.25026 | -0.617889 | 0.5372 |
| **CGS** | 1.160137 | 1.260112 | 0.920662 | 0.3581 |
| **CR** | -0.393233 | 1.315690 | -0.298880 | 0.7653 |
| **MC** | 7.18E-11 | 3.86E-11 | 1.856479 | 0.0646 |
| **SALES** | 8.993556 | 1.477349 | 6.087629 | 0.0000 |
| **TA** | -8.345104 | 1.470989 | -5.673124 | 0.0000 |
| **AR** | 0.002500 | 0.064460 | 0.038784 | 0.9691 |
| **R- square** | | 0.155678 | | |
| **Adjusted $R^2$** | | 0.134744 | | |
| **Durbin-Watson** | | 1.770572 | | |
| **F-statistic** | | 7.436738 | | |
| **Prob(F-statistic)** | | 0.000000 | | |

Results indicate that current ratio and cash gap has insignificant coefficients. Log of sales and log total assets are highly significant with return on assets. It endorse that with increase in size of firms has positive impact on firm's ability to utilize its assets to create profits by comparing profits with the assets that generate the profits.

Table 6 shows the results of variance inflation factor and tolerance factor .VIF ranges 1.029 to 6.029 which shows no sign of multicollenarity in the model .similarly the results of tolerance factor vary from .166 to.972 which confirm the absence of multicollenarity the lowest value of TF is .166 for Log of total assets while current ratio has highest value .972.

Table 6. Values of variance inflation factor and tolerance factor

| Variables | VIF | TF |
|---|---|---|
| **CR** | 1.029 | .972 |
| **Sales** | 5.962 | .168 |
| **CGS** | 1.168 | .856 |
| **MC** | 1.148 | .871 |
| **Total assets** | 6.029 | .166 |

## 6. Conclusion

This study empirically examines the association between profitability and liquidity for a sample of 50 companies of different sectors of Karachi Stock Exchange. The study found that Current ratio is important variable as compared to cash gap having a significant relationship with net operating income and with return on assets which implies that firms properly manage their short term obligations which have positive consequences on firm's profitability.

Negative correlation has been found between cash gap and firm's profitability. Superficially it would seem that a relatively short cash cycle would be a sign of good management. A firm is quick to collect cash from sales once it pays for purchases. However in case of Pakistan negative cash gap is due to pending payments of bills resulting in payment cycle longer than operating cycle. This measure reflects both operating and financing decisions of the firm. Current ratio and total assets show a positive and significant relationship with net operating income while cash gap in days depicts a negative relationship.

The value of F statistics significantly endorsing the validity and stability of the model .The value of Durbin-Watson shows that there is not a problem of autocorrelation.

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