

Does an Optimal Working Capital Exist? The Role of Financial Constraints

Nawab Khan

School of accounting, Zhongnan University of Economics & Law, Wuhan, P.R., China.

Minhas Akbar (Corresponding author)

School of finance, Zhongnan University of Economics & Law, Wuhan, P.R., China.

Ahsan Akbar

Lecturer in Finance, University of Education, Lahore, Pakistan

This project is funded by Zhongnan University of Economics and Law, Wuhan, P.R. China under “**Innovative Research Project of International Graduates**”

Abstract

The aim of the present study is to examine the linkage between working capital management, financial constraints, and profitability of the listed textile firms of Pakistan during 2005-2014. The outcomes of panel models reveal that more (less) financially constrained firms to have smaller (longer) net trade cycle. Moreover, the study found an inverted U-shaped relationship between investment in working capital and firm performance. Based on the empirical results of this study it is suggested that financial managers should try to maintain an optimal level of working capital to optimize the profit performance of the firm, as an investment in working capital above that optimal point will negatively affect the corporate profitability.

Keywords: Working Capital, Firm Performance, Financial Constraints, Pakistan.

1. Introduction:

The principal objective of any firm is to maximize the shareholder wealth and firm value. While, investment decisions play a key role in the maximization of wealth and value of the firm. Management usually takes two type of decisions related to the nature of the assets, one related to capital structure and the other related to current asset management or working capital management decisions. It is imperative for the management to make the optimal use of firm's resources in order to maximize the shareholder value. Finance managers pay much attention to long-term long term investment and financing opportunities, yet management of working capital also plying a key role in firm's performance and the decision related to working capital management can significantly influence the performance fundamentals of an enterprise.

There is a plethora of literature on capital structure and dividend policy, however, little attention has been given to the area of short-term financial management because the short-term decision is usually reversible in nature. Yet the liquidity position of a firm can have serious repercussions for the existence of a business in the short-run. The short lived assets and liabilities deserve attention because they play a key role in the profitability and wealth maximization of the shareholders (Smith, 1980). To create value, every firm shall strive to attain an optimal level of working capital that efficiently balances the tradeoff between liquidity and profitability (DeLoof, 2003; Westhead & Howorth, 2006). There are two opposing views about the level of working capital, one views goes the higher the working capital higher will be the bargaining power for firms to get discounts through early payment, moreover, firms can increase their sales volume by offering generous credit terms to their customers (DeLoof, 2003), However the other group of researchers argues that higher level of working capital can increase the risk of bankruptcy as the short-term assets are the least productive and do not earn any cost of capital for the firm (Kieschnick, Laplante, & Moussawi, 2013). Keeping these views in perspective, there is a possibility of the existence of an optimal working capital for each firm which not only avoids bankruptcy but can also increase the overall profitability and value of the firm. So it can be hypothesized that there could be an inverted U-shaped relation between working capital and firm performance fundamentals, that is increasing in working capital can increase firm profitability up to a certain level but after that level the increment in working capital can increase the risk of bankruptcy and deteriorate the firm value (Baños-Caballero, García-Teruel, & Martínez-Solano, 2014). The performance of the firms in respect of working capital has been empirically tested in several studies (Baños-Caballero et al., 2014), (Dr. Talat Afza, 2008; Kasiran, Mohamad, & Chin, 2016) the results of these studies recommends that working capital decisions affect firm performance. (Wang, 2002) found a negative relationship between the profit proxies and Cash Conversion Cycle (CCC) and postulate that aggressive working capital policy can increase the firm performance. These studies signify that efficient working capital management can increase firm performance.

To obtain the level where the working capital increases the value of the firms it is essential to find the factors which can affect the level working capital decisions. (Carpenter, Fazzari, Petersen, Kashyap, & Friedman, 1994) found that investment in the working capital is effected by the access to external financing. The financial constraints can significantly influence the investment in working capital. The optimal level of working capital is lower of firms that are facing financial constraints (Baños-Caballero et al., 2014)

The firms with high working capital level show greater sensitivity to investment in working capital and cash flows, and low sensitivity to investment in fixed capital to cash flow, this suggest that the working capital can be used by management to remove the effect of cash flow on fixed capital investment. When the cash flow is uncertain the large size old firms adjust fixed capital investment and small new firms adjust working capital, the firms with low cash flow can try to adjust both if they are exposed to internal financing constraints. Thus, firms that are more exposed to leverage makes more adjustment in working capital, however, firms having low fixed capital cash flow and high working capital to cash flow face high external financing constraints (Knight, Ding, & Guariglia, 2010). There is a significant relation between the firm's profitability and the level of its working capital (Mun and Jang (2015). Some studies suggest that internal and external funds are a perfect substitute if the market is perfect (Modigliani & Miller, 1958). But owing to an imperfect market the external financing is not a perfect substitute for the internal funding source, so based on these studies firms have different financing constraints.

The main objective of this study is to investigate the relation between working capital level, financial constraints and firm profitability of companies that are listed on Karachi stock exchange (KSE). This study is conducted to analyze the impacts of financial constraints on working capital level to investigate the significance of the financial constraints for working capital level and how the management reacts to financial constraints in the context of the working capital optimum level. Moreover, the study analyzes the impact of financial constraints on the optimum level of the working capital in textile firms of Pakistan listed on KSE. The empirical outcomes of this study verify the existence of an optimal working capital in the Pakistani listed firms, in addition, the working capital level of financially constrained firms was substantially lower than firms with less financial constraints. The results of this study uncover important information about the dynamics of working capital in more and less financially constrained firms. According to the best of our knowledge, no prior study explored the impact of working capital management on firm profitability by taking into account the financial constraints in an emerging economy like Pakistan.

2. Literature Review

Working capital make the upper part of the balance sheet of the firms including the currents assets of the firms, but the net working capital can be found by subtracting current liability from the current assets. Recent researches e.g., (Deloof, 2003; Juan García-Teruel & Martínez-Solano, 2007; Naser, Nuseibeh, & Al-Hadeya, 2013; Padachi, 2006; Shin & Soenen, 1998) studied the impact of the working capital on the profitability on the firms that how the profitability of the firms reacts to different levels of the working capital and with different working capital policies and it has been found that there is negative relationship between the profitability and the working capital level. (Wang, 2002) observed the relationship between cash conversion cycle and ROA and ROE and revealed a negative association. They found in their study that through efficient management the reduction in the cash conversion cycle can be translated into the firm profitability. (Shin & Soenen, 1998) in their study verified the negative relationship between profitability and net trading cycle which they calculated as $NTC = (AR/Sales) * 365 + (Inventories/Sales) * 365 - (AP/Sales) * 365$. The ratio of these two groups of items shows the liquidity of the firm. Traditionally the corporate finance area of study emphasized on the long term financial decision, particularly investment decisions, capital structure, dividend policy and returns of the company (Smith, 1980). The optimum level of working capital is essential for the performance of any business entity but different sector and firms within the same sector have different financial constraints which affect their optimum level of working capital. Working capital management from chief financial officer perspective is difference between current assets and current liabilities (Harris, 2005), but in broader view, the working capital management covers all activities related to customer, supplier and products liability (Harris, 2005), the investment decision of the firm working capital is important for managers and it is difficult job for them to find the optimum level of working capital (Lamberson, 1995). The role of working capital in the performance of the manufacturing firms is very important to increase the value of the firm. The efficiency of the working capital management is important for the performance of the manufacturing firms as most assets of these firms consist of current assets (Van Horne & Wachowicz, 2004). Moreover, the firms in Pakistan follows conservative working capital management policies and to improve their performance management should improve the collection policies. To optimize the working capital management firms should hire specialized financial personnel (Raheman, Afza, Qayyum, & Bodla, 2010). To create value, the firms tries to maintain the optimal level of working capital (Deloof, 2003; Westhead & Howorth, 2006) and (Afza & Nazir, 2008). The firms with high working capital level show high sensitivity to investment in working capital to cash flow, and low sensitivity to investment in fixed capital to

cash flow, this suggest that the working capital can be used by management to remove the effect of cash flow on fixed capital investment. When the cash flow is uncertain the large size old firms adjust fixed capital investment and small new firms adjust working capital, the firms with low cash flow trying to adjust both if they have internal funding constraints. The firm more exposed to leverage, that uses more working capital adjustment, and those firms have low fixed capital cash flow and high working capital to cash flow face high external financing constraints. While firms with lower collateral and high debt adjust fixed assets (Knight et al., 2010). The high level of working capital enables the firm to increase sales and get greater discounts for early payments which increase firm value (DeLoof, 2003). But if the firm's working capital level is excessively high it has to obtain extra funds which expose the firms to bankruptcy risk (Kieschnick et al., 2013).

In the perspective of textile sector, (A. Akbar, 2014) investigates the relationship between working capital management and corporate performance for a panel of 77 chinese textile firms. Study provide a strong support to the notion that working capital management has a negative impact on corporate performance. The investment of the firms depends on upon the financial factors like availability of the internal funds, access to external funds and cost of the external fund (Fazzari, Hubbard, Petersen, Blinder, & Poterba, 1988). The working capital is more sensitive to financial constraints than fixed assets (Fazzari & Petersen, 1993). The optimal level of working capital for a firm is sensitive to the financial constraints. The optimal is lower for those firms which face financial constraints. Furthermore, there is an inverted U-shaped relation between the firm's working capital and profitability which show that the performance of the firms beyond that optimal working capital point will be adversely affected (Baños-Caballero et al., 2014). In the context of Pakistan, Similar findings were suggested by (M. Akbar & Akbar, 2016). They analyzed the association between working capital management and corporate performance for the firms that observe the guidelines of Shariah supervisory board of Karachi Meezan Index-30. Study suggests an inverted U-shaped relationship between working capital management and corporate performance.

3. Hypothesis development:

(Modigliani & Miller, 1958) proposes that in a perfect market, companies can always obtain external financing without any problems hence, their investment does not depend on the availability of internal capital. Once capital market imperfections (informational asymmetries and agency costs) are present, capital market frictions increase the cost of outside capital relative to internally generated funds (Greenwald, Stiglitz, & Weiss, 1984; Jensen & Meckling, 1976; Myers & Majluf, 1984). Accordingly, external capital does not provide a perfect substitute for internal funds. (Stiglitz & Weiss, 1981) also shows that how asymmetric information may result in debt rationing. Specifically, (Hill, Kelly, & Highfield, 2010) proposes that firms with greater internal financing capacity and capital market access hold a higher working capital level. Thus, on the basis of this argument we develop the first hypothesis of this study;

H1: Financially constraint firms tend to have smaller net trade cycle as compare to fewer constraint firms.

The performance of the firms in respect of working capital management level has been observed by several studies e.g., (Baños-Caballero et al., 2014), (Dr. Talat Afza, 2008; Kasiran et al., 2016) these and other researcher find out that working capital decision affect firms performance. Therefore, there should be the significant and positive impact on the working capital level on the firm performance.

H2: There is a positive relation between the working capital management and firm's performance.

To obtain the level where the working capital increase the value of the firm it is essential to find the factors which can affect the level working capital decisions in the study of (Fazzari & Petersen, 1993) it has been found that investment in the working capital is effected by the access to external financing. The firms facing financial constraints influence the investment decisions in working capital; the working capital optimum level is lower of the firms which have financial constraints, therefore, there is an inverted U-shaped relationship between the working capital to the profitability (Baños-Caballero et al., 2014). It can be hypothesized that the coefficient of the square of NTC should be significantly negative.

H3: Square of NTC has a negative impact on the firm performance

4. Sample selection, Variables and Methodology.

A sample of this paper consists of textile firms of Pakistan that are listed on Karachi stock exchange for the years (2005 to 2014). For any firm having less than five years of consecutive data was dropped from the sample. This practice yields 110 firms with 1335 firm-year observations.

Data for this paper is extracted from balance sheet analysis (BSA) provided by State Bank of Pakistan (SBP). The panel data is used because the sample will contain the data across firms and over time. Moreover, panel data sets are better able to identify and estimate effects that simply are not detectable in pure cross-sectional or pure time-series data. Financial constraints proxies will be used to investigate their impact on the working capital level.

The following model is used to check the relationship between working capital management and firm performance.

$$ROA = \beta_0 + \beta_1 NTC_{i,t} + \beta_2 NTC_{i,t}^2 + \beta_3 SIZE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 VNOI_{i,t} + \epsilon_{i,t}$$

In the above model ROA, is the dependent variable which is used as a proxy for firm performance. It is measured as earnings before interest and tax scaled by total assets. Following (Shin & Soenen, 1998), NTC is calculated as $NTC = (AR/Sales) * 365 + (Inventories/Sales) * 365 - (AP/Sales) * 365$. It is a proxy for firm working capital management. NTC^2 is simply the square of NTC. It is expected that NTC has a positive relation with performance of the firm. However, square of NTC should have a negative association with the performance. SIZE is measured by taking the natural log of annual sales of the firm. Large sales volumes are associated with better performance. Thus, the relationship between ROA and SIZE is predicted to be positive. LEV, leverage of the firm, is calculated as total debt scaled by total assets of the firm. Leverage is predicted to have a negative association with firm performance. VNOI, variability in net operating income is measured by taking the standard deviation of annual net operating income for the sampled time period.

5. Empirical Results

5.1 Financial constraint and working capital level

Table 1 present the results of our first hypothesis that financially constraint firms have smaller net trade cycles as compare to the firms that are less likely to be financial constraints. For this purpose, the sampled firms are divided into two groups those have financial constraints and the one with no financial constraints. In this study, we have employed three different proxies to divide the firms into financially constraint or less constraint group.

The first proxy that we have used is dividends. (Fazzari et al., 1988) argues that firms that tend to pay a large dividend are less likely to be financially constrained. However, non-dividend paying (or low dividend paying) firms are considered as financially constrained. Thus, we split our data into zero-dividend (financially constraint) and positive dividend (financially less constraint) groups.

Our second proxy for financial constraints is cash flow measures as the ratio of earnings before interest and tax plus depreciation scaled by total assets. This measure was proposed by (Moyen, 2004). Firms with cash flows above (below) sample median are considered to be financially less (more) constrained.

Many studies use firm size as an inverse proxy of financial constraints e.g., (Almeida, Campello, & Weisbach, 2004; Carpenter et al., 1994; Faulkender & Wang, 2006). Following the proposition that smaller firms face higher informational asymmetry and agency costs and, hence, will be more financially constrained. (Whited, 1992) shows that larger firms have better access to capital markets, so they face lower costs of external financing. Thus, Size of the firm is measured as natural log of sales and then firms below (above) the sample median were considered more (less) likely to be financially constraint.

Finally, we separately calculate the average (median) of the net trade cycle for the firms in both groups.

Findings provided in table 1, clearly indicates that on average, less financially constrained firms have larger net trade cycles as compare to their counterparts, and supports the first hypothesis of this study. If we look at the results, the first proxy for financial constraints which is dividend, reveals that on average, less constraint firms take 91.79 days to complete their trade cycle. However, more constraint firms spent only 78.17 days. Similar findings were revealed by the second and third proxy of financial constraints.

5.2 working capital management and firm performance

In this section, the second and third hypothesis of the study is tested. First of all descriptive statistics is applied on the sampled data.

Table 2 provides the results of descriptive analysis applied on the variables selected for regression analysis. Return on assets has a mean value of 1.894 which shows that on average sampled firms are generating positive profits. Average of NTC is 111. It means that firms take 111 days to complete their net trade cycle. The size of the selected firms vary largely as the minimum value of size is 7.36 whilst, the maximum is 17.81 with a standard deviation of 1.44.

At the next step, we have applied panel data models fixed-effects and random-effects models. Hausman specification test was applied to see that which model provides more consistent results. A statistically significant p-value of the Hausman specification test suggests that Fixed-effects model provides more consistent results.

Regression results reported in table 3, shows that NTC has a positive and significant association with firm performance proxy ROA. While, NTC^2 has a negative relationship with performance. These findings suggest that working capital has an optimal level thus, firms that are operating at a level lower than the optimal level has a positive association with performance. However, once they crossed the optimal level, it will have a negative association with firm performance. These findings are in line with (Baños-Caballero et al., 2014 & M. Akbar & Akbar, 2016). Leverage is found to have a negative association with firm performance revealing that, highly leveraged firms performance will be lower than those firms that are less leveraged. Moreover, the size of the firm has a significantly positive association with its performance. It depicts that large firms outperform the smaller firms in textile sector of Pakistan.

6. Conclusion

The aim of this paper was to find out the possible effects of financial constraints on working capital management. We used three different proxies, largely suggested in the literature, to measure the level of financial stress of the sampled firms. The study reveals that financially less (more) constraint firms have larger

(smaller) net trade cycle. In the next step, study checks the association between working capital management and firm performance. For this purpose Net Trade cycle, square of net trade cycle and some control variables were regressed on ROA, a profitability measure. Findings suggest an inverted U shape relationship between working capital management and firm performance. As NTC has a positive and statistically significant association with return on equity whilst, NTC² found to have a negatively significant relationship with firm performance. Similar findings were suggested by (Baños-Caballero et al., 2014). Moreover, among control variables, leverage has a negative while, firm size has a positive association with firm performance. Both are significant at (P<0.01).

Bibliography:

- Afza, T., & Nazir, M. S. (2008). Working capital approaches and firm's returns. *Pakistan Journal of Commerce and Social Sciences*, 1(1), 25-36.
- Akbar, A. (2014). Working Capital Management and Corporate Performance: Evidences from Textile Sector of China. *European academic research*, 2(9), 11440-11456.
- Akbar, M., & Akbar, A. (2016). Working Capital Management and Corporate Performance in Shariah Compliant firms. *European Academic Research*, 4(2).
- Almeida, H., Campello, M., & Weisbach, M. S. (2004). The cash flow sensitivity of cash. *The Journal of Finance*, 59(4), 1777-1804.
- Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2014). Working capital management, corporate performance, and financial constraints. *Journal of Business Research*, 67(3), 332-338. doi: 10.1016/j.jbusres.2013.01.016
- Carpenter, R. E., Fazzari, S. M., Petersen, B. C., Kashyap, A. K., & Friedman, B. M. (1994). Inventory investment, internal-finance fluctuations, and the business cycle. *Brookings papers on economic Activity*, 1994(2), 75-138.
- Deloof, M. (2003). Does working capital management affect profitability of Belgian firms? *Journal of business finance & accounting*, 30(3-4), 573-588.
- Dr. Talat Afza, M. S. N. (2008). Working Capital Approaches and Firm's Returns in Pakistan. *Pakistan Journal of Commerce and Social Sciences*, Vol.1.
- Faulkender, M., & Wang, R. (2006). Corporate financial policy and the value of cash. *The Journal of Finance*, 61(4), 1957-1990.
- Fazzari, S. M., Hubbard, R. G., Petersen, B. C., Blinder, A. S., & Poterba, J. M. (1988). Financing constraints and corporate investment. *Brookings papers on economic Activity*, 1988(1), 141-206.
- Fazzari, S. M., & Petersen, B. C. (1993). Working capital and fixed investment: new evidence on financing constraints. *The RAND Journal of Economics*, 328-342.
- Greenwald, B. C., Stiglitz, J. E., & Weiss, A. (1984). Informational imperfections in the capital market and macro-economic fluctuations: National Bureau of Economic Research Cambridge, Mass., USA.
- Harris, A. (2005). Working capital management: difficult, but rewarding. *Financial Executive*, 21(4), 52-54.
- Hill, M. D., Kelly, G. W., & Highfield, M. J. (2010). Net operating working capital behavior: a first look. *Financial Management*, 39(2), 783-805.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial economics*, 3(4), 305-360.
- Juan García-Teruel, P., & Martínez-Solano, P. (2007). Effects of working capital management on SME profitability. *International Journal of Managerial Finance*, 3(2), 164-177.
- Kasiran, F. W., Mohamad, N. A., & Chin, O. (2016). Working Capital Management Efficiency: A Study on the Small Medium Enterprise in Malaysia. *Procedia Economics and Finance*, 35, 297-303. doi: 10.1016/s2212-5671(16)00037-x
- Kieschnick, R., Laplante, M., & Moussawi, R. (2013). Working capital management and shareholders' wealth. *Review of Finance*, 17(5), 1827-1852.
- Knight, J., Ding, S., & Guariglia, A. (2010). Investment and financing constraints in China: does working capital management make a difference?
- Lamberson, M. (1995). Changes in working capital of small firms in relation to changes in economic activity. *American Journal of Business*, 10(2), 45-50.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48(3), 261-297.
- Moyen, N. (2004). Investment-cash flow sensitivities: Constrained versus unconstrained firms. *The Journal of Finance*, 59(5), 2061-2092.
- Mun, S. G., & Jang, S. (2015). Working capital, cash holding, and profitability of restaurant firms. *International Journal of Hospitality Management*, 48, 1-11. doi: 10.1016/j.ijhm.2015.04.003
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial economics*, 13(2), 187-221.

- Naser, K., Nuseibeh, R., & Al-Hadeya, A. (2013). Factors influencing Corporate working capital management: Evidence from an Emerging Economy. *Journal of Contemporary Issues in Business Research*, 2(1), 11-30.
- Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: an analysis of Mauritian small manufacturing firms. *International Review of business research papers*, 2(2), 45-58.
- Raheman, A., Afza, T., Qayyum, A., & Bodla, M. A. (2010). Working capital management and corporate performance of manufacturing sector in Pakistan. *International Research Journal of Finance and Economics*, 47(1), 156-169.
- Shin, H.-H., & Soenen, L. (1998). Efficiency of working capital management and corporate profitability. *Financial practice and education*, 8, 37-45.
- Smith, K. (1980). Profitability versus liquidity tradeoffs in working capital management. *Readings on the management of working capital*, 549-562.
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, 71(3), 393-410.
- Van Horne, J., & Wachowicz, J. (2004). *Fundamentals of Financial Management*, Prentice Hall Publishers, New York.
- Wang, Y.-J. (2002). Liquidity management, operating performance, and corporate value: evidence from Japan and Taiwan. *Journal of Multinational Financial Management*, 12(2), 159-169.
- Westhead, P., & Howorth, C. (2006). Ownership and management issues associated with family firm performance and company objectives. *Family Business Review*, 19(4), 301-316.
- Whited, T. M. (1992). Debt, liquidity constraints, and corporate investment: Evidence from panel data. *The Journal of Finance*, 47(4), 1425-1460.

Table 1, financial constraints and level of working capital

Proxy for Financial constraints	Average NTC for financially less constraint firm	Average NTC for financially more constraint firm
Dividend (Fazzari et al., 1988)	91.79	78.17
Cash flow (Moyen, 2004)	85.66	82.79
Size (Whited, 1992)	91.95	72.10

Table 2. Descriptive analysis

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROA	1335	1.894	12.216	-117.8	179.4
NTC	1335	111.0	125.98	-25.78	1281.5
NTC ²	1335	28191	105072	.0010	1642408
LEV	1335	.6911	.26941	.0307	2.709
SIZE	1335	14.25	1.4472	7.369	17.812
VONI	1335	18.40	109.10	-2492.5	191.54

Table 3, Results of Fixed-effects Model: ROA as dependent variable

Variables	Coefficient	T-Statistics
NTC	0.0221***	2.60
NTC ²	-0.0000365***	-4.43
LEV	-16.51***	-8.31
SIZE	1.754***	3.03
VONI	0.0009	0.24
Constant	-13.14	-1.43
N	1335	1335
Overall R ²	0.138	0.138

* $P < 0.1$, ** $p < 0.05$, *** $p < 0.01$