The Impact of Working Capital Management and Business Risk on Performance of Financially Constrained and Non-Constrained Firms: Evidence from Pakistan

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Abstract

The purpose of this study is to analyze the impact of working capital management and business risk on performance of financially constrained and non-constrained manufacturing firms. Furthermore, this study also analyzes the differences in relationship of working capital management, business risk and firm performance by using different proxies of financial constraints. Data for the study is collected for the years 2007-2016, of Pakistan stock exchange listed firms. This research is conducted on financial data extracted from financial statements of 251 Pakistani manufacturing firms. The stated relationship is examined by using GMM technique of estimation. Findings of the study revealed that working capital management has positive impact on firm performance and business risk has negative impact on firm performance. This study analyzed that inverted U-shaped relationship exists between working capital and firm performance. Furthermore, it is revealed that financially constrained firms have lower working capital level than financially non-constrained firms. Moreover, it is analyzed that financially constrained firms have higher business risk than financially non-constrained firms. The current study suggests that financially constrained firms should reduce agency conflicts, perform operations efficiently and use such strategies which leads to minimize the risk and enhance the firm performance. This study suggests that financially constrained firms should manage their working capital efficiently by reducing cash conversion cycle in order to improve the performance.

Key words: Pakistan, financial constraints, working capital management, business risk, firm performance

Introduction

The money needed to finance the daily basis operations of a firm is referred as *working capital*. Kesimli and Gunay (2011) stated that *working capital management* (WCM) is the management of investment in current assets and current liabilities of the firm which are liquidated within a year or less than one year. Hence it is essential for firm's day-to-day operations. Accordingly, Vahid et al (2012) said that success or failure of a firm is determined by working capital management. Working capital affects the profitability of the firm and optimal level of working capital is sign for success of a firm.

The core objective of every firm's management is to maximize the profit by increasing sales and minimizing costs to get the attraction and attachment of shareholders because the baseline purpose behind all this is to maximize the profits of the firm and value for shareholders.

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The relationship between working capital management with firm performance is studied by (Temtime, 2016) for 176 small manufacturing firms of U.S. The study found that performance of small manufacturing firms is significantly affected by WCM and implementation of aggressive and conservative policies.

Livdan, Sapriza, and Zhang (2009) analyzed that all the firms which have low level of capital, low productivity and high level of current debt are referred to as more financially constrained firms. Such sort of firms has high shadow prices i.e. defined as cost of debt due to financial deficit in a firm. Khan, Akbar and Akbar (2016) found that more financially constrained firms have high net trade cycle and less financially constrained firms have low net trade cycle. Moreover, they found inverted U –shaped relationship between investment in working capital and performance of Pakistani textile firms. Financially constrained firms face problems in managing their working capital which lead to poor performance. Opler and Titman (1994) studied the S& P financially constrained and non-constrained firms. They found that when these firms can't manage their working capital, heighten its liabilities then these firms lose their sales and liquidity value. In contrast to this (Buehlmaier and Whited, 2018) analyzed that financial constraints have influence on returns of stock exchange. Novelty of their findings proved that firms which are financially constrained have more higher ratio of returns than non-constrained firms.

All firms have two types of risk one is financial risk and other is business risk. In present study business risk is under discussion because it is related to operations, strategies, compliance and reputation of a firm that have short term and long-term effects on performance of financially constrained and non-constrained firms of manufacturing sector. It is essential to analyze the influence of business risk on firm performance because of continuous volatility in economic and political conditions of Pakistan. Crouhy et al (2006) stated that firms adopt such policies by using which business risk could be minimum. According to (Amit and Wernerfelt, 1990; Conine, 1982) *business risk* is non-systematic risk in framework of CAPM. Therefore, it may be due to some natural factors, mismanagement, competition, change in demand, government policies or unique production unit or inability of financial or human capital. According to (Martin, Scott and Vandell,1979) determinants of business risk can be categorize as external or environmental factors and internal or firm unique factors. Manufacturing firms try to reduce their business risk due to three basic objectives. First, business risk is related to the conflict between managers and shareholders. Managers reduce this risk for their job security and preservation of investment in firm. Secondly, risk of cash flows coming from operations is also included in business risk. Thirdly, diversification of business risk is concerned with transaction and time cost. Alshubiri (2015) analyzed that firms get benefit from daily operations therefore, efficient management of these operations remains target objective of the firm. Hence, business risk becomes minimum and firm value becomes maximum. Dasgupta, Li and Yan (2018), investigated the relationship of financial constraints in firms and inventory which is main constituent of a business. Their findings suggested that constraints in firms effects the monetary policy so these firms become unable to get external finance. Shortage of finance can reduce their capacity to meet demand of inventory which increases business risk as compared to non-constrained firms.

Decisions taken by managers to do investment in working capital influence the riskiness of firms so the firms that are financially constrained due to too much high working capital increases their business risk which ultimately affect their financial performance. Most of the researchers in existing body of knowledge proved that business risk or financial risk have relationship with

financial performance of firms like (Bowman, 1980) found negative relationship between risk and return. Similarly, (Oviatt and Bauerschmid,1991) found positive relationship between risk and return.

The Pakistan economy has benefited from manufacturing sector that span geographical areas of the country. This study focused on manufacturing sector because it is major contributor in economic growth and development of Pakistan. According to fiscal year 2016-2017 manufacturing sector contributes 20.88% in gross domestic production (GDP) of Pakistan. Therefor this sector is intention of this study and efficient management of working capital and business risk environment in Pakistan engineered this research. By reviewing the background literature on working capital management, it is cleared that many studies have been done on working capital management with profitability, performance but not done in the presence of business risk and specifically for financially constrained and non-constrained firms. To the best of researcher knowledge, no study is conducted on the issue and specifically when business risk is included which is a very important element effecting corporate performance and also related with working capital management is unexplored. The main motive of this study is to analyze the impact of working capital management and business risk on performance of financially constrained and non-constrained manufacturing firms. Furthermore, this study also analyzes the differences in relationship of working capital management, business risk and firm performance by using different proxies of financial constraints which include dividend, dividend payout, cash flow, size and Z-score. Finally, following Caballero et al (2014) and Altaf & Shah (2017) the researcher used generalized method of moment (GMM) to control the problem of endogeneity and heteroskedasticity. The present study broadens the scope of working capital management literature by adding important variable like business risk. However, the consolidation of these variables with firm performance as dependent variable is the unique contribution of this study to the existing body of knowledge. This study will help managers of non -financial firms of Pakistan to take accurate and timely decisions of investment in working capital. Management of these firms will get to know that working capital management is backbone of corporation and it will result in high corporate performance. Operations of each firm are essential for high or low performance of firm, so current research has significant importance for financially constrained and non-constrained firms. If these firms manage their business operations according to their cash flows, market conditions, economic and political conditions of country then operational risk/business risk could be minimal and high return could be gained.

Review of Literature

Goal of working capital management is to enhance firm value. If firm cannot maintain an optimal working capital, it goes to bankruptcy situation. Afrifa (2016) analyzed that working capital management is the management of current assets and current liabilities and better management of these components gives high firm value. Similarly, Hill, Kelly, and Highfield (2010) analyzed that a firm can reduce its financing cost by reducing its current assets. Moreover, this cost may be reduced by allocation of financial resources in profitable projects. Padachi (2006) Said that small medium enterprises of paper and printing are ‘hidden champion’ because in this industry components of working capital management has significant effect on profitability. He said that higher the level of investment in accounts receivables and inventories leads to lower level of profitability. Orobia et al (2013) said that if proper procedures, policies and systems does not exist in small business then managers of these firms efficiently manage their working capital. This management may be by planning, monitoring and controlling the components of working capital on base of their intuition. They said that attitude and experience of managers matters a lot in management of working capital and financial performance of business. Baker et al (2017)

investigated the practices adopted by managers and chief financial officers of manufacturing firms of India. They said that managers focus on CCC to manage their working capital. These firms control and manage their inventory by using enterprise resource planning system. Afza and Nazir (2007) found that aggressive behavior of investment in working capital gives negative relation to performance of Karachi stock exchange firms. Ramesh, Habsi and Sharji (2017) concluded that management of cash conversion cycle, accounts receivables, accounts payable, and inventory have negative effect on financial performance of listed firms of Oman. Efficient WCM is essential because if aggressive working capital management policy will be adopted then business risk will increase. Therefore, Caballero, Teruel & Solano (2010) analyzed that older small medium enterprises with greater cash flow meet long cash conversion cycle. They said that firms with high growth opportunities, high leverage, and high investment in fixed assets adopt aggressive working capital policy. Investment level in working capital might be increased through access to external financial resources otherwise cost of external financing have negative effect on cash conversion cycle. Mehta (2017) examined the impact of working capital management on performance of non-financial firms of Asian countries. Results of the study proved that in some countries this relationship is found "U" shaped or inverted "U" shaped but non-financial firms of Taiwan and Vietnam shows positive relation between WCM and profitability and negative relation is shown by Thailand firms.

Caballero, Teruel & Solano (2014) analyzed that investment in working capital is beneficial in terms of cost minimization and value maximization for a firm till an optimal working capital level. They said that investment in working capital at lower level leads to higher firm performance but when this investment is higher than optimal working capital then it shows inverted U-shaped relationship, in some cases it goes to bankruptcy. Similarly, Altaf and Shah (2017) analyzed the relationship of working capital management with performance of non-financial firms of India. Hence, inverted u-shaped relationship is observed for financially constrained and non-constrained firms. Moreover, they said that financially constrained firms have low level of optimal working capital than non-constrained firms because constrained firms face high cost to get external finance. On the basis of above discussion, the researcher expected inverted U-shape relationship between CCC and performance of firm so, give first hypothesis;

H1: There is inverted U-shaped relation between working capital management and firm performance.

Caballero, Teruel & Solano (2014) found that cost of external and internal finance may be different due to asymmetric information that prevail between market and firm. Moreover, they said that insufficient market information decreases the firm's investment level in high return projects and due to incomplete market information high cost on external finance may face. Alm, Liu and Zhang (2018), found that more financially constrained firms involve in tax evasion activities so, they face problems in managing their working capital. Most of these firms do transactions on cash bases rather than through banks. Modigliani & Miller (1958) analyzed that in perfect market conditions investment of firms do not depend on internal financing, firms get finance smoothly without any extra financing cost. According to (Greenwald, Stiglitz, & Weiss, 1984; Jensen & Meckling, 1976; Myers &Majluf, 1984) asymmetric information environment exist between market and firms, so frictions of financing exist to get finance or to invest in working capital. It is expected that constrained firms of Pakistan may have less working capital than non-constrained firms. Therefore, second hypothesis stated as;

H2: Financially constrained firms tend to have lower working capital as compared to non-constrained firms.

Amelia & Gama (2015) observed negative relationship between firm profitability and components of cash conversion cycle. Tauringana and Afrifa (2013) analyzed that accounts receivables have significant negative relation with profitability of firm and there is significant negative association of accounts payable to firm performance. While in contrast to these CCC and inventory have insignificant relationship with profitability of firms. Nobanee and Ellili (2015) analyzed the relationship of working capital management efficiency and performance of construction companies of Kuwait stock exchange. They found negative significant relation between these two variables for large construction companies while working capital management has insignificant impact on performance of small construction companies that cannot manage their WC efficiently. Zeidan and Shapir (2017) studied the impact of working capital on performance and prices of real estate industry. They found that firms of real estate can increase performance by efficient management of working capital. Their results suggested that if managers are successful in achieving optimal working capital then shareholders value could be high by tiny financial investment. Bagh et al (2016) analyzed that WCM efficiency has positive influence on performance while average collection period has negative influence on firm performance. So, having different background views in literature positive relationship between CCC and performance expected.

H3: There is positive relationship between working capital management efficiency and firm performance.

Business risk is uncertainty related to future operating income, variability in future sales, or operating leverage. Not too much plethora of literature exist on business risk measurement or to check its impact on performance of firm. Lynge & Zumwalt (1980) analyzed some core sources of business risk. These sources are volatility in income and inflexible cost structures. Gale (1972) analyzed that business risk may influence the nature of the industry in which any firm performs its operations. He said that leverage is a tool through which level of business risk could be measured and in case of risk premium hypothesis higher level of debt will lead to higher return or performance.

Hurdle (1974) found the condition in which business risk could be minimum. First, he stated that business risk of a firm can low if industry is riskless. Secondly, according to market structure theory, business risk can be minimum by adequate control over the price to maintain appropriate profit over going period of time. Thirdly, higher the market power led to lower the business risk and higher the performance. Meulbroek (2002) analyzed that operational risk of firm may be affected by strategies of firm. These strategies give more responsibilities to personnel to get desired goals of the firm. Bell, Landsman and Shackleford (2001) analyzed the relationship between perceived business risk and audit fee that is cost. They found that higher business risk of audit firms leads to increase of audit hours not audit fee per hour. High audit hours due to high business risk, firm faces additional cost of audit hours. Kale, Noe and Ramirez (1991) concluded in their study about business risk that high ratio of debt to capital structure of a firm tends to have high cost of finance due to which volatility in cash flows increases. Yang and Tsatsaronis (2012) analyzed the relationship of risk and return in banks. They said that returns of banks increase or decrease with business cycle. Higher level of debt boosts up the operational risk of banks due to high financing cost. Although they found that systematic risk is more concerned with leverage. Bickley (1959) analyzed that risk is inherited in every business but its nature and degree level changes over time. Business risk may be due to internal risk factors or external risk factors. Yavitz and Newman (1982) analyzed that risk level of firm at pre-mature stage is affected by decisions of

investment and prediction about business environment may affect this risk level. Accurate forecast about investment in working capital or other assets of firm enables the firm managers to take accurate decisions. It is cleared that investment on forecast base increases business risk but it may increase firm performance. Alshubiri (2015) analyzed in industrial sector of Oman that business risk has significant impact on firm performance. Hurdle (1974) investigated a more composite relationship between business risk and liabilities. Higher level of liabilities highlights the variations in firm performance due to fluctuations in sales level that is basic factor of business risk. Sales decline may lead to loan defaults. Thus, debt have a positive effect on business risk. Amit & Wernerfelt (1990) analyzed that lower the business risk of firm increases the level of cash flow or value of firm which is basically intimation of high firm performance. Abazari, Hasanzadi and Nahandi (2014) analyzed the effect of environment risk and business risk on performance of 79 companies of Tehran stock exchange. They analyzed that market risk and economic risk shows no effect on performance of firms while business risk shows negative impact on firm value. They proved that environment risk does not affect firm performance. They showed that business risk has significant effect because if any operation or sales fail then performance may fall down. Hence, after studying literature researcher expects that business risk may negatively influence the firm performance.

H4: There is a negative relationship between business risk and firm performance.

Financial constraints are the accessibility to capital market. Kaplan and Zingales (1997) broadly defined financial constraints as when firms "face a wedge between the internal and external costs of funds". Afterward (Banerjee et al, 2009; Claessens and Tzioumis, 2006) analyzed that financially constrained firms are unable to invest and get profit from profitable investment projects and then inefficient allocation of this profit money and lower firm performance. Changa et al (2007) analyzed that financial constraints in Australian companies have less amount of internal finance to invest but increases the cash holding capacity. Investment of financially constrained firms is less affected by positive cash flows. Altaf & Shah (2017) found an inflection point between working capital and firm performance. At this point cost and benefit becomes equal and further investment decreases firm performance. Moreover, they said that Indian non-financial firms may take 70 days on average to complete its cash conversion cycle. Their findings also explore that financially constrained firms have low level of investment in working capital than non-constrained firms. Ferrando and Ruggieri (2015) investigated the relationship between firm's financial constraints, access to external finance, labor productivity and firm performance for Euro-area countries. They found that in most of the sample countries financial constrains lower the performance of micro firms. Jegers (2010) investigated the existence of financial constraints, their effect on performance and agency problem in non-profit organizations first time using stylized model. Findings of this model showed that financial constraints exist in non-profit organizations that lower the performance and productivity of these organizations due to high agency problems. Increasing level of agency conflicts affects the access to debt and cost of external finance that limited the investment in profitable projects. Ahmed and Hashmi (2015) analyzed that financial constraints exist in manufacturing industries of Pakistan. These constraints vary across different industries that have different level of impact on investment behavior and financing decisions of firms. Their study investigated that in Pakistan investment opportunities are present for all industries except for engineering industry. Financially constrained firms are unable to get loan from banks and other financial institutions, remains underinvest and finally show bad performance. Such scenario seems to be in developing areas' firms due to high risk environment. On the basis of models of financial constraints (Moyen, 2004) categorized the firms in financial constrained

model and non-financial constrained model on dividend base. Non-constrained firms pay dividend and have more cash flow fluctuations than financially constrained firms. Carpenter, Fazzari & Petersen (1998) focused on working capital and concluded that it is a base of liquidity that can part of fixed investment if firm is financially constrained. These firms do not pay dividend.

Jin, Zhao and Kumbhakar (2018) found an inverted U-shaped relationship between financial constraints in firms and level of productivity. They observed that state- firms of China are less constrained than non-state firms because they have ease in access to external finance. The researcher expects high level of business risk in manufacturing firms of Pakistan which are financially constrained.

H5: Financially constrained firms have higher level of business risk as compared to non-constrained firms.
H6: Differences exist in different measures of financial constraints in case of WCM, BR and Firm Performance relationship.

Research Methodology

There are 581 total companies listed on Pakistan Stock Exchange. All manufacturing firms that are listed on Pakistan stock exchange from different sectors are target population of the study which were almost 441. The time period of the study is from the year 2007-2016. First of all, we eliminated firms having not data of all 10 consecutive years. Then firms having missing values of any one or more than one variables of any year were excluded. After filtration of these companies only 251 companies were selected as sample. Secondary data is extracted from financial statements of the firms. Total firms of target population of different sectors and sample firms are depicted in table.1. Firm performance is dependent variable used in this study. Firm performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. In literature Tobin'Q and ROA both are used as market and accounting based performance measures respectively. In this study return on assets (ROA) is used as performance measure because working capital and business risk are internal concerns of the firms so, Tobin'Q is not selected. Working capital management and business risk are independent while firm leverage, age, and growth are control variables of the study. Kesimli and Gunay (2011) states working capital management (WCM) is the management of investment in current assets and current liabilities of the firm which are liquidated within year or less than one year. This variable is assessed by cash conversion cycle that clarify the efficiently management of working capital. Moreover, CCC gives information that in how many days a firm completes its cycle of payment of purchase of raw materials, accounts payables, inventories and accounts receivables. Duration of cash conversion cycle varies from firm to firm depending upon the operations of the firm, credit and management policies of the firm and sales or asset size of the firm. Crouhy et al. (2006) define business risk as the uncertainties about the demand and price for products and services. After studying previous studies researcher used significant measure of business risk following by (Alshubiri, 2015) which is earning variability. Firm age is defined as the observation year minus the registered start year (Coad, 2014). Age of firm is core control variable in this study because large and older firms have high market network, and reputation, based on it when these firms face financial problem, could get debt by facing less external finance cost as compared to small and newly born firms. So, performance results will be biased that's why age of firm will be controlled

Table.1

Detail of Sample Used in Study

Sector No	Sector Name	Total No of Companies	Selected No of Companies
1.	Automobiles	22	17
2.	Cables & Electrical	8	6
3.	Cement	21	16
4.	Chemicals	29	19
5.	Engineering	19	7
6.	Food & Personal care	23	14
7.	Fertilizer	7	3
8.	Glass & Ceramics	11	6
9.	Miscellaneous	23	10
10.	Oil & Gas	12	9
11.	Paper & Board	10	7
12.	Pharmaceutical	12	7
13.	Power Generation	19	7
14.	Refinery	4	3
15.	Sugar	34	20
16.	Synthetic & Rayon	11	6
17.	Tech & Communication	10	5
18.	Tobacco	3	2
19.	Transport	5	3
20.	Textile	152	81
21.	Vanaspati & Allied	6	3
		441	251

Growth of firm may be in two ways; it may be external or internal. When a firm enhance sits sales volume is considered growing internally. Therefore, firms focus on product quality, design, customer demand and advertisement of existing and new launching products. For this purpose, firm can get finance from external sources by borrowing or issuing shares or may use internal source of finance. Term leverage has origin from "lever" word used in physics which means that to exert a little bit pressure to pull mass. In finance language firms get leverage or debt which act as a lever to run firm, this leverage is called financial leverage. It is fruitful for firm if used efficiently. Leverage is used as measure of financial leverage followed by (Qureshi & Azid, 2006). Fazzari et al (1988) defined firms as financially constrained if the cost of external funds relative to the cost of internal funds is so high that a firm cannot invest in profitable projects. To examine the effect of financial constraints on working capital management and business risk likelihood of firms to financial constraints is analyzed by different measures as used in background literature.

1. Dividend: Dividend is used here to classify the firms into financially constrained or non-constrained firms as used by (Caballero, Teruel & Solano, 2014; Carpenter Fazzari & Petersen, 1998).

2. Dividend Payout: Firms are categorized according to dividend payout ratio that is done by (Caballero, Teruel & Solano, 2014; Faulkender & Wang, 2006; Almeida, Campello & Weisbach, 2004). Highly constrained firms pay low dividend as compared to less constrained firms.

3. Cash flow: An empirical approach used by (Caballero, Teruel & Solano, 2014; Moyen, 2004) firms are also classified on the basis of cash flow to test the probability of financial constraints. Firms with a cash flow above the sample median are assumed to be non-constrained and below median are financially constrained.

4. Size: Most of the studies (Caballero, Teruel & Solano, 2014; Faulkender & Wang, 2006; Almeida, Campello & Weisbach, 2004) used the size as proxy of financial constraints. Small size firms have agency cost and high information asymmetry hence, these are considered financially constrained firms. Whited (1992) analyzed that larger firms have easy access to capital market so, bear low cost of external finance hence, are considered financially non-constrained firms. Natural logarithm of sales is taken to calculate size of firm and firms above the sample median are assumed to be non-constrained and below median are financially constrained.

5. Z-Score: Numerical relation of a value to its mean value is nominated as Z-score. Its value may be positive, negative or zero. In order to check the likelihood of financial constraints and non-constraints in firms Z-score is calculated for whole sample. Re-estimation of Altman's (1968) model is used here followed by (Sonia, Teruel, Solano, 2014). Firms having z-score above median value are considered as non-constrained and below median are financially constrained firms. Dummies are made for all five proxies of financial constraints. To make dummy variable, 1 is used for financially non-constrained firms and 0 for constrained firms. As optimal working capital level of investment is measured by $(-\beta_1/2\beta_2)$ for financially less or non- constrained firms and this optimal level comes from $\{-(\beta_1+\alpha_1)/2(\beta_2+\alpha_2)\}$ for more financially constrained firms. Earning variability of non-constrained firms is measured by β_1 and for financially constrained firms it is calculated by $(\beta_1-\beta_3)$. Proxies and formulas of all variables are depicted in table.2

Table.2

Measurement of Variables

No	Variable/Category	Proxy	Formula
1.	**Firm Performance**		
i.		ROA	Net Income / Total Assets
2.	**Working capital management**	Cash Conversion Cycle (CCC)	[{(inventories-accounts payable)/cost of goods sold}+(accounts receivable/sales)]*365
3.	**Business Risk**	Earning Variability	Standard deviation of EPS/ MPS
4.	**Firm Age**	Age of firm	Log(Age of firm since its incorporation)
5.	**Growth of firm**	Sales	(Sales of current year-Sales of previous year)/ Sales of previous year=$(Sales_t – Sales_{t-1})/Sales_{t-1}$
6.	**Financial Leverage**	Leverage	Total debt / Total Assets
7.	**Financial Constraints**		
i.		Dividend	Dividend pay or Not
ii.		Dividend payout	Amount of dividend / Net Income
iii.		Cash Flow	(EBIT + depreciation)/ Total Assets
iv.		Size	Ln(Sales)
v.		Z-Score	$=0.717X_1+0.847X_2+3.107X_3+0.42X_4+0.998X_5$

According to explanation given in previous sections, several reasons explain that non-monotonic relationship is found between WCM and firm performance. Specifically, in this study linear relationship is found between CCC, business risk and firm performance. Inverted U-shaped relation is observed in CCC and firm performance. Therefore, different models are estimated to check this functional form. Panel data regression methodology is used in current study due to its various advantages. Hsiao (1985) said that panel data methodology overcomes the problems of heterogeneity and endogeneity and make results unbiased. In current study endogeneity is present because as WCM, business risk and other control variables affect the firm performance same like that performance may affect these explanatory variables. Baltagi (2001) analyzed that panel data is more informative, reduce the problem of multicollinearity and give efficient results. Panel data is processed through Stata software to test proposed hypotheses.

To analyze the impact of business risk and working capital management on performance of Pakistani manufacturing firms, regression analysis is performed in the presence of some influencing control variables. For this generalized method of moment (GMM) panel regression technique is used. Which allowed to control the problem of endogeneity. Endogeneity is controlled by executing instrumental variable estimation method in which lagged variables are used as instruments by software. In first and foremost section of analysis impact of working capital management and business risk on firm performance is analyzed. To check this relationship following model is estimated.

$ROA_{i,t}= \beta_0+ \beta_1 E.V_{i,t}+\beta_2 CCC_+\beta_3 AGE_{i,t}+\beta_4 LEV_{i,t}+\beta_5 GRT_{i,t}+\lambda_t+\eta_i+\varepsilon_{i,t}$………………**Model.1**

Moreover, in second part inverted U-shaped relationship between working capital management and firm performance is analyzed. Furthermore, this relationship is analyzed in financially constrained and non-constrained firms. Theory suggested that only linear relationship exists between business risk and firm performance. As this relation is already analyzed in model.1 so, now it is confirmed in financially constrained and non-constrained firms. Different extensions of model.3 and 4 are estimated by using different proxies of financial constraints.

$ROA_{i,t}=\beta_0+\beta_1 CCC_{i,t}+\beta_2 CCC^2{}_+\beta_3 AGE_{i,t}+\beta_4 LEV_{i,t}+\beta_5 GRT_{i,t}+ \lambda_t+ \eta_i +\varepsilon_{i,t}$…………**Model.2**

$ROA_{i,t} = \beta_0+ (\beta_1+\alpha_1 DFC_{i,t})\ CCC_{i,t} +(\beta_2+ \alpha_2 DFC_{i,t})\ CCC^2{}_{i,t}+\beta_3 AGE_{i,t}+\beta_4 LEV_{i,t}+ \beta_5 GRT_{i,t}+\lambda_t+\eta_i+\varepsilon_{i,t}$……………………………………………………………....**Model.3**

$ROA_{i,t}=\beta_0+\beta_1 EV+\beta_2 DFC_{i,t}+\beta_3(EV*DFC) +\beta_4 LEV_{i,t}+ \beta_5 GRT_{i,t}+\lambda_t+\eta_i+\varepsilon_{i,t}$ ………..**Model.4**

Where, ROA= Return on assets, CCC= Cash conversion cycle, EV= Earning Variability, AGE= Firm age, LEV= Financial leverage, GRT= Growth of firm, DFC= Dummy for financial constraints, it = ith term at time t, i= 1, 2, 3……n, β0= intercept of model, βi= Coefficient of X_{it} variables, X_{it}= the different explanatory variables taken in this study at time t, t= Time=1, 2……10 years, Ɛ0 = error term, ηi= measures the specific characteristics of each firm called unobservable heterogeneity, λt = time dummy variables

Results and Discussion

Descriptive statistics of variables of the study is presented in table.3. Mean value of cash conversion cycle for 251 manufacturing firms is 79 days so, on average manufacturing firms listed on Pakistan stock exchange took only 79 days to complete and recover its cash out flow and cash inflow cycle. While standard deviation value of CCC is 81. Return on asset is on average 3 %. On

average earning variability ratio of Pakistani firms is 0.5 showing that manufacturing firms of Pakistan have more fluctuations in earnings. Sample firms have 10% average value of sales growth ratio. Mean value of leverage ratio is 59% showing that manufacturing firms have more than fifty percent of debt in their capital structure.

Table.3

Descriptive Statistics of Variables

Variables	Mean	Std.Dev	Median	Min	Max
CCC (in days)	79	81	74	-392	480
ROA (ratio)	0.03	0.1	0.03	-1.9	0.7
E.V (ratio)	0.5	1.2	0.1	0.002	15.6
GRT (ratio)	0.1	0.4	0.1	-0.9	6.9
LEV (ratio)	0.59	0.26	0.59	0.02	2.4
AGE (ln)	9.4	0.5	9.3	5.9	10.9
OBS	2510	2510	2510	2510	2510

*****ROArepresents return on asset; CCC is cash conversion cycle; E.V is earning variability; GRT is growth opportunities; LEV is leverage; AGE is the No of incorporation years; OBS is total no of observations.

Sample firms of the study categorized in to two categories, financially constrained firms and financially non-constrained firms. Descriptive statistics of these separate firms depicted in table 4. According to cash flow and dividend measures of financial constraints, mean value of ROA is negative for financially constrained firms and positive for non-constrained firms. This trend depicts that financially constrained firms have bad performance than non-constrained firms. Moving ahead, the average value of CCC of financially constrained firms lower than non-constrained firms. Mean value of business risk is higher for financially constrained firms than non-constrained firms, showing that operations of these firms are not performing well.

Correlation matrix analysis between dependent variable (ROA), independent variables (CCC, EV) and control variables (GRT, LEV, AGE) of the study is shown in table 5. Report of table 5 clears that all independent variables are significantly correlated with dependent variables of the study which gives a rough support to our propositions that cash conversion cycle and earning variability interact with ROA that is accounting based measures of performance. Results of the following table confirms that none of the variable in correlation matrix has greater than 0.8 value. According to Damodar (2004) exceed of correlation from this threshold confirms Multicollinearity problem. This problem is not present in our study which is also confirmed through variance inflation factor

Table.4

Descriptive Statistics of Variables on Categorical Base

	Cash Flow				Dividend			
	Financially Constrained		***Non-Constrained***		***Financially Constrained***		***Non-Constrained***	
Variables	**Mean**	**Std.Dev**	**Mean**	**Std.Dev**	**Mean**	**Std.Dev**	**Mean**	**Std.Dev**
ROA(ratio)	-0.011	0.107	0.087	0.083	-0.009	0.109	0.086	0.083
CCC(days)	76.745	99.355	80.25	57.186	74.49	97.74	82.58	59.29
E.V(ratio)	0.785	1.637	0.178	0.427	0.795	1.561	0.163	0.632
AGE(Ln)	9.371	0.483	9.327	0.516	9.308	0.496	9.392	0.501
LEV(ratio)	0.684	0.286	0.500	0.190	0.694	0.274	0.489	0.196
GRT(ratio)	0.095	0.423	0.148	0.337	0.106	0.424	0.137	0.337
OBS	1260	1260	1250	1250	1270	1270	1240	1240

Table.5

Correlation matrix

	ROA	**CCC**	**EV**	**GRT**	**LEV**	**AGE**
ROA	1					
CCC	.036	1				
EV	-.277**	-.031	1			
GRT	.198**	-.025	-.041*	1		
LEV	-.505**	-.163**	.309**	-.008	1	
AGE	.016	.068**	.015	-.072**	-.069**	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

CCC positively correlates with ROA at 1% level of significance. However, earning variability negatively correlates with return on asset at 1 % significance level which implies that high variation in earnings will lead to low performance of firm. The correlation coefficient of leverage which is ratio of total debt to total asset has negative relationship to return on asset which implies that higher the leverage level in firm capital structure will lower the firm performance

Regression Analysis

In first and foremost part impact of working capital management and business risk on firm performance is analyzed where performance is measured with accounting-based measure (ROA). WCM efficiency is measured with CCC because it covers the complete business cycle.

Table.6

Results of estimation of Cash Conversion Cycle, Earning Variability - Firm Performance

Dependent Variable; ROA	
E.V	-0.012***(-22.7)
CCC	-0.00004***(-2.5)
AGE	-0.058***(-4.1)
LEV	-0.326***(-32.9)
GRT	0.048***(12.1)
Sargen *(p value)*	0.06
Obs	2510

* ROA is Return on asset; CCC is cash conversion cycle; E.V is earning variability; AGE is years of firm incorporation; LEV is the leverage GRT the growth opportunities; Time and industry dummies are not reported. Z statistics is in parenthesis. Sargan refers to p-values for over-identifying restrictions distributed asymptotically under the null hypothesis of the validity of instruments. ***, **, *Significance at 1, 5 and 10 % level

Significant negative coefficient of cash conversion cycle is clear indication that by efficient management of payments of purchase of raw material, accounts payable and collection of accounts receivables manufacturing firms of Pakistan can increase firm performance and hence generate value for shareholders according to agency theory. This negative coefficient of CCC indicates that by decreasing the cash conversion cycle performance of firm can be enhancing. Our findings are consistent with (Raheman et al, 2010) having (-0.0008) coefficient of CCC with net operating profitability which proves that lower cash conversion cycle is way of high firm performance of manufacturing firms of Pakistan. By following results of our second main independent variable i.e business risk coefficient of earning variability is negative significant to firm performance at 1% level when accounting based measure is used. Which proves that higher level of business risk may reduce the performance of Pakistani firms. Because according to agency theory of this study, managers and employees are responsible to increase or decrease business risk on behalf of shareholders. In case of manufacturing firms' operations, strategies, reputation and regulations are not efficiently planned, controlled and performed by managers and employees that increase or decrease business risk which affects the performance of firm and interest of shareholders. Results of the study are aligned with (Abazari, Hasanzadi and Nahandi, 2014; Bowman, 1980). Where beta of earning variability is (-0.377) with net profit ratio implying that high level of earning variation leads to low level of performance of firms of Oman

Table.7

Results of estimation of Cash Conversion Cycle - firm performance

Dependent Variable; ROA	
CCC	0.0000204 (0.6)
CCC^2	-0.000000252***(-2.5)
AGE	-0.033** (-2.0)
LEV	-0.261*** (-25.1)
GRT	-0.48*** (9.4)
Sargan*(p value)*	0.07
Obs	2510

* Return on asset is dependent variable; CCC is cash conversion cycle; CCC^2 is square term of CCC; AGE is years of firm incorporation; LEV is the leverage; GRT the growth opportunities Time and industry dummies are not reported. Z statistics is in parenthesis. Sargan refers to p-values for over-identifying restrictions distributed asymptotically under the null hypothesis of the validity of instruments. ***, **, *Significance at 1, 5 and 10 % level respectively.

The outcomes of impact of CCC on return on asset are presented in table 7. Inverted U-shaped relationship between CCC and performance of manufacturing firms is found. Which implies that performance of firms might be increased by investment in working capital at low level and decreased at high level. The coefficient of cash conversion cycle is positive ($\beta>0$) and significant negative ($\beta<0$) for its square at high level of significance. Therefore, findings of our study indicates that discount on early payment and effect of high sales volume dominate below an optimal working capital level. After that optimal level when firm has working capital above this level opportunity cost and financing cost dominate. Hence, the relationship between firm performance and working capital becomes negative. Further, these results indicate that as current and previous studies proved that working capital management efficiency has positive impact on firm performance. Thus, manufacturing firms of Pakistan must have efficient working capital policies. Hence, that cash conversion cycle could be reduced and efficient investment decisions could be taken. Coefficients of cash conversion cycle and its square allows to determine the inflection point in relationship of cash conversion cycle and firm performance. Thus, the optimal number of days within which manufacturing firms may complete its CCC are 40.47 days. After that optimal level positive impact of working capital management on firm performance goes to negative. Results of the study are similar to the results of (Caballero et al, 2014) where optimal no of days 66.95 are for non-financial firms of UK. Altaf and Shah (2017) found 63 optimal number of days for non-financial firms of India. Significant negative coefficient of leverage implies that high leverage ratio may reduce firm performance and vice versa. Growth coefficient is negative significant to ROA. Thus, it is observed that in context of current study increase in sales volume has inverse effect on firm performance. P-value of Sargan test is presented in table. Since, p-value is insignificant implying that instruments and error terms are not correlated with each other.

Impact of working capital management and business risk is analyzed in financially constrained and non-constrained firms. Financially constrained firms have less internal finance and access to external finance is not easy task for these firms. As working capital have inverted U-shaped relation to firm performance so this relationship is analyzed in financially constrained and non-constrained firms and optimal level is calculated for both type of firms. Business risk has negative relation to firm performance. Thus, here it is analyzed that either financially constrained firms have high business risk according to theory while non-constrained firms have low business risk. As it is discussed that asymmetric information prevails between market and firm may cause credit

rationing and high cost of external or internal finance. Because insufficient information between market and firm may cause of high external financing cost that effects investment in profitable projects. High optimal level of working capital needs excess of finance and firms facing financing constraints have shortage of internal finance to invest and high cost of external finance so their optimal level is lower than financially non-constrained firms. Findings of model.3 by changing it after including different proxies of financial constraints are depicted in table.8. Hence, results confirmed inverted U-shaped relation between CCC and firm performance. Moreover, the inflection point for financially constrained and for less or non- constrained firms is calculated. The researcher observed that inflection point for more financially constrained firms is lower than financially non-constrained firms. Optimal level of working capital is 77.27 days for financially non-constrained firms and (40.9) days for financially constrained firms when dividend is used as proxy for financial constraints.

Table.8

Financial constraints, Cash Conversion Cycle- Firm Performance

Dependent Variable; ROA					
Financial Constraints criteria					
	Dividend group	**D. Payout ratio group**	**Cash flow group**	**Size group**	**Z-score group**
CCC	0.0000561* (1.73)	0.0000419* (1.4)	0.0000647** (1.9)	-0.0000646* (-1.5)	0.00002 (1.1)
CCC*DFC	-0.000066 (-1.1)	-0.00021*** (3.5)	-0.0000974* (-1.4)	0.000036*** (5.0)	0.00048*** (5.8)
CCC²	-3.63e-07*** (-4.08)	5.18e-08 (0.6)	-3.69e-07*** (-4.1)	1.0e-07 (0.8)	1.11e-07* (1.4)
CCC²*DFC	4.84e-07*** 2.44	-1.58e-06*** (-9.3)	6.15e-07*** (2.4)	-7.75e-07*** (-4.2)	-2.22e-06*** (-11.5)
AGE	-0.001*** (-5.2)	-0.001*** (-5.7)	-0.001*** (-5.1)	-0.002*** (-4.5)	-0.001*** (-5.3)
LEV	-0.297*** (-34.1)	-0.296*** (-32.9)	-0.298*** (-34.8)	-0.241*** (-20.2)	-0.299*** (-34.1)
GRT	0.046*** (8.3)	0.045*** (8.7)	0.045*** (8.3)	0.053*** (7.2)	0.049*** (8.3)
Sargan(*p value*)	0.06	0.01	0.07	0.05	0.05
Obs	2510	2510	2510	2510	2510

* Return on asset is dependent variable; CCC is cash conversion cycle; CCC^2 is square term of CCC; AGE is years of firm incorporation; LEV is the leverage; GRT the growth opportunities; DFC is dummy for financial constraints; Time and industry dummies are not reported. Z statistics is in parenthesis. Sargan refers to p-values for over-identifying restrictions distributed asymptotically under the null hypothesis of the validity of instruments. ***, **, *Significance at 1, 5 and 10 % level respectively.

Similarly, optimal level of working capital for financially non-constrained firms is 87 days and 66.4 days for financially constrained firms when cash flow is use as proxy for financial constraints. Findings of the study are in line with (Caballero et al, 2014) where optimal level of working capital is 1.2 days for non-constrained and (-0.17) days for financially constrained firms when dividend is used as proxy for financial constraints. Significant negative coefficient of leverage indicates that as debt to asset ratio of firm will increase performance of firm may decrease. Therefore, firm may have low leverage ratio so performance of firm could be enhanced. Growth coefficient is positive implying that increase in sales of firm may increase in performance of firm. Therefore, manufacturing firms of Pakistan must focus on increase in sales volume. Age is showing negative relationship to performance because in our data set financially constrained firms are also included therefore, findings suggest that performance of financially constrained firms decline with increase of years of incorporation because as age increase constraints also increases. Hence, financing constraints paly role in level of investment in working capital. This lower level of working capital may be due to asymmetric information, bad management of CCC or high cost of finance faced by already financially constrained firms.

Negative linear relationship between business risk and firm performance is proved. Afterward, this relationship and level of business risk is analyzed in financially constrained and non-constrained firms. Financially constrained firms have low cash inflow than cash outflow. Because of low internal finance, firms are not performing their operations efficiently. According to agency theory when conflicts between managers and shareholders goes on peak such constrained firms face more problems in access to external finance, efficient operations and strategies, proper obligations are not followed so level of business risk becomes higher than financially non-constrained firms. Findings of model.4 by changing it with different proxies of financial constraints are depicted in table.9. Results of the study confirm negative relation between business risk and firm performance. Moreover, level of business risk for less or non- financially constrained firms and more financially constrained firms is calculated. Hence, business risk for more financially constrained firms is higher than financially non-constrained firms. Significant negative coefficient of leverage indicates that as debt to asset ratio of firm increase performance of firm may decrease. Therefore, firm may have low leverage ratio so performance of firm could be enhanced. Significant negative growth coefficient implies that when firms have high business risk, increase in sales may have negative impact on firm performance. Thus, higher level of business risk in financially constrained firms might be due to inefficient performance of operations, high cost of leverage faced by financially constrained firms. All proxies of financial constraints show similar results.

Table.9

Financial constraints, Earning Variability- firm performance

Dependent Variable; ROA					
Financial Constraints criteria					
	Dividend group	D. Payout ratio group	Cash flow group	Size group	Z-score group
EV	-0.0081***	-0.0089***	-0.0083***	-0.0084***	-0.0096***
	(-10.2)	(-12.6)	(-7.8)	(-9.2)	(-9.8)
DFC	0.0695***	0.0478***	0.1953***	0.0744***	0.0858***
	(5.9)	(5.3)	(11.3)	(4.5)	(8.3)
EV*DFC	0.0171***	0.0504***	0.0076	0.0073***	0.0855***
	(4.8)	(15.2)	(0.9)	(5.2)	(18.9)
LEV	-0.2553***	-0.2478***	-0.2500***	-0.2449***	-0.2417***
	(-34.1)	(-35.3)	(-26.4)	(-32.6)	(-26.8)
GRT	-0.0266***	-0.0269***	-0.0042	-0.0202***	-0.0068
	(-4.1)	(-4.2)	(-0.6)	(-3.1)	(-0.9)
AGE	-0.0695***	-0.0680***	0.0196	-0.0741***	-0.0316***
	(-5.7)	(-6.5)	(1.2)	(-6.5)	(-2.6)
Sargan (*p value*)	0.08	0.05	0.005	0.01	0.03
Obs	2510	2510	2510	2510	2510

* Return on asset is dependent variable; EV is earning variability; AGE is years of firm incorporation; LEV is the leverage; GRT the growth opportunities; DFC is dummy for financial constraints; Time and industry dummies are not reported. Z statistics is in parenthesis. Sargan refers to p-values for over-identifying restrictions distributed asymptotically under the null hypothesis of the validity of instruments. ***, **, *Significance at 1, 5 and 10 % level respectively.

The **Hypothesis 1** of the study was designed to analyze the inverted U-shaped relationship between working capital management and firm performance. Findings confirm that inverted U-shaped relationship prevails between CCC and firm performance relation. **Hypothesis 2** of the study is that financially constrained firms tends to have lower working capital than non-constrained firms. The findings of study reveal that optimal level of working capital changes with change of financing conditions of firms. Therefore, it is confirmed that financially constrained firms have lower level of working capital as compared to financially non-constrained firms which is due to high cost of external finance and asymmetric information.

Hypothesis 3 of the study is that working capital management efficiency has positive impact on firm performance. Results of the study reveal that working capital management efficiency has positive impact on performance so, firms may enhance their performance by reducing their cash conversion cycle. **Hypothesis 4** of the study is that business risk has negative impact on firm performance. Findings of the study prove that relationship. Therefore, managers of manufacturing firms should minimize agency conflicts, perform operations of firm efficiently,

firm compliances should be followed, and strategies should be revised to get better firm performance.

Hypothesis 5 of the study is that financially constrained firms have high level of business risk as compared to non-constrained firms. This hypothesis of the study confirms so, financially constrained firms should reduce agency conflicts. F.C firms should adopt such strategies that internal funds could be used for investment instead of getting external finance by paying high cost. **Hypothesis 6** of the study is that differences exist with different measures of financial constraints in WCM and BR relationship with firm performance. Two out of five measures of financial constraints gave inverted U-shaped relation with different inflection points. Hence, it is said that dividend and cash flow are best measures of financial constraints when working capital is under study while all five measures are relevant when business risk is under study, if performance of Pakistani manufacturing firms is measured with ROA.

Conclusion

To the best of researcher knowledge, no study is conducted on the issue and specifically when business risk is included which is a very important element effecting corporate performance and also related with working capital management is unexplored. The main motive of this study is to analyze the impact of working capital management and business risk on performance of financially constrained and non-constrained manufacturing firms. Same like the previous literature this study explored the linear and non-linear relationship between CCC and performance of the firm. This study has value addition in literature by examining this relationship separately in financially constrained and non-constrained firms. Moreover, the other main intention of this research is to examine the level of business risk in financially constrained and non-constrained firms. In this study agency theory relates to working capital management in perspective of finance managers who are agents of owners or principals of the firm. All the decisions related to short term assets and liabilities are taken by them if they will not take accurate decisions they will overinvest or underinvest firm's capital which will be cause of more or less constraints in financially constrained or non-constrained firms that will affect account payables, accounts receivables or inventories of a firm which will increase or decrease firm performance. Agency theory also explains the relationship of business risk and firm performance because according to (Aminu & Zainudin, 2015) shareholders invest in firm's capital to get high risk-adjusted return. Conflicts between managers and shareholders increases business risk. Therefore, if conflicts will be reduced then good finance managers and employees will take good decisions on behalf of principals and help firm with required skills, time, human capital, efficient allocation of business resources. Basic intention behind all this is to manage business risk by their efficiency in exchange of which they require high firm performance which will provide them high remuneration, high dividend, sophisticated work environment. Accordingly, the major findings of the study revealed that working capital management efficiency has positive impact on firm performance as evident by the negative relationship between CCC and firm performance. Firms should reduce cash conversion cycle so that working capital could be managed efficiently and as a result performance of manufacturing firms of Pakistan could be better. Moreover, results of the study suggested that business risk has negative impact on firm performance implying that higher business risk leads to lower performance of manufacturing firms. The business risk of firm can reduce by focusing on utilization of financial resources and minimization of agency conflicts.

CCC relationship with firm performance is revealed inverted U-shaped which means that firm performance can be increased by investment in working capital up to a specific level. While after

this level firm performance goes down even investment is done with same pace. Afterward, it is found that financially constrained firms have lower level of working capital as compared to non-constrained firms. This lower level implies that performance of financially constrained firms starts may start to decrease after 53 days. In current study five measures of financial constraints are used to confirm above discussed working capital and business risk level. Dividend and cash flow measures showed significant and inverted U-shaped relationship in financially constrained and non-constrained firms. Therefore, these two measures are better with reference to Pakistan as proxies of financial constraints. This study analyzed that financially constrained firms have high business risk than non-constrained firms implying that financially constrained firms may be in trouble internally due to operations, conflicts, and strategies. Business risk could be decreased by efficient allocation of existing finance of firm, by proper monitoring of firm daily operations. All five measures of financial constraints show same results in relationship of business risk and performance of financially constrained firms. Financial risk could be studied instead of business risk because financial risk is main deceiver to performance. Working capital policies of financially constrained and non-constrained firms should be analyzed. As financially constrained firms aggressive, conservative policies may be different from non-constrained firms.

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