New Insight in Working Capital Determinants Making Sensitivity Analysis for Non-financial Listed firm's Evidence from Pakistan

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Abstract

This study tends to focus on Sensitivity and Sectoral analysis for the Determinants of Working Capital evidence form Pakistani non-Financial Listed Firms. The study remained tapped in working capital decision for the developing market like Pakistan. The data use in this study consists on time period 2005 to 2017. However multi-tools for data analysis are selected. For the diagnostic testing like descriptive summary and correlation Metrix are used. Furthermore OLS regression and fixed model also selected for analysis. The determinants of working capital in this study examined at two different levels. Firstly at firm level, like leverage, firm size, liquidity and ROA etc. Secondly at sectoral level like munificence, dynamism and HHI etc. The involvement of textile and sugar sector of Pakistan can't be ignored in economic development of Pakistan. The determinants at firm level show highly significant relationship with working capital. The study is beneficiary for the students, researchers, investors and other finance managers for working capital management.

Keywords: Sensitivity Analysis, Working capital, Dynamism, Munificence, HHI

Introduction

Working capital is not a modern concept in the field of finance literature.It is consider very essential for the availability of funds, possible opportunities in growth and to detect firm financial risk.Accordance with Smith,(1980) importance of working capital can't be eliminate, it has influence on firm risk and profitability. The tradeoff between profitability and risk is quite required, high risk and high return

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phenomena practiced in investment.The timely availability of funds can increase by efficient working capital management, as results the growth opportunities increased and shareholder return also enhance.

According to Abbadi, and Abbadi, (2013) if consideration is not tend to focus on efficient working capital then firms can't survive for long term. In the light of previous literature many researchers tend to focusedon working capital decisions particularly from developed markets. However some researchers also remained tapped from developing and emerging markets. Mostly researchers remained tapped on financing decision of working capital that is concerned with the decision of firms in which working capital is financed.Some other researchers tend to focused on investment decision in which firm decide investment for long and short time period.In keeping view the firm size, growth, industry and risk etc. the optimal level should be observed.

The aim of study is to examine determinants of working capital at two different levels, first is firm level that include firm size, growth, liquidity, tangibility and book to market ratio etc. second is sector level which include dynamism, munificence and HHI etc. The study tend to focus on sectoral and sensitivity analysis for the determinants of working capital evidencefrom Pakistan no financial listed firms.For the sensitivity analysis the study divideeconomic recession into two major parts and make a across sectoral analysis at different stages.

Research objectives

1- To examine the all significant determinants of working capital at firm level and sector level.
2- To evaluate the sectoral effects for the determinants of working capital across sectors.
3- To investigate the influence of determinants of working capital in different economic recessions making sensitivity analysis in developing market Pakistan.

Significance of the study

The study will be useful for the researchers, investors of capital market to provide a direction of investment decision.However the study will helpful for the finance managers to make working capital management decision. The financial analysist also get benefits from the study to make the investment strategies for other investor of the market guiding and giving ideas etc.The study is useful for the students, researchers to educate the all stakeholders and enhance the knowledge about working capital decision.

Literature Review

The research related with Working Capital goes back to the primordial times of economics. Since the publication of The Wealth of Nations by Adam Smith (1776), economists have recognized an important role of working capital on firm's capital structure. Adam Smith made a clear division between circulating capita and fixed capital. His definition for "circulating capital" was similar to today's notion of working capital. Furthermore, Dewing (1941) suggested that the Society of Mines Royal in 1571 divided its capital in "fixed and current capital" being a "key" element for the firm.

In this working capital's definition there are no short-term components, but with the incorporation of strategic elements as capital and fixed assets, it was possible to relate to other alternatives meanings and applications for WCM. Preve and Sarria-Allende (2010) also empathizes that working capital is one of the sources of funds to meet the financial needs for operations. Although working capital decisions plays an important role in firms' day-to-day decisions, it did not get the same level of attention and relevance as the classic finance decisions' research from Miller and Modigliani (Smith, 1973; Jose 1996; Shin and Soenen, 1998; García-Teruel and Martínez-Solano, 2007; Baños-Caballero 2010).

Mills (1996) found a relevant relationship between external factor determinants and working capital. He studied the impact of inflation in the budgeting process. He found that the higher the net working capital the greater will be the impact of the inflation. He also found that inflation influences the firm's behavior. Inflation makes firms attempt to reduce their net working capital, altering their debt/asset ratio using more short-term debt, increasing debt short-term levels comparing to the long-term ones. Lamberson (1995) found evidence that internal and external factor determinants should be taken into consideration in WCM. Furthermore Largay and Stichney (1980) revealed of theirresearch W.T. Grant a nationwide retailerconfronted the deficit in moneycirculation from operations due to mismanagement of working capital which ended up with chapter. Agencycan't survive for longer intervalthe place due consideration just isn't given for administration of working capital effectively (Dong and Su, 2010).

The sensitivity analysis is a unique technique in modern world. It can check the effects on model and also further proceed by checking changes in various parameters. Sensitivity analysis helps in determining the factors which are consider the key drive for model Eriksson and Hede (1999). To checking the effects of different economic recessions the study remains tapped with different sectoral effects during making sensitivity analysis.

Theoretical Review

In line with theoretical perspective of working capital management for the response of principal the gent spend cash on working capital. According to (Mclnnes 2000) the agent also managed all accounts, stock and money conversion cycle in such a methodto make sureefficient and environment friendly utilization of present asset. Furthermore according to Anand (2001) when and individual make working capital investment it directly linked with type of industry in which individual operate and all policies of working capital management adopt and practice.

Pecking Order theory in corporate finance one of the major theories is pecking order, it participates in capital structure of the firms, developed by (Majluf and Myers 1984). The managers of the firms have prior knowledge for existing and new investment opportunities. Being aware of the asymmetric information problem, they discount the firm's new and existing risky securities when stock issues are revealed. They also prefer to use retained earnings and low debt instead of equity share to finance their projects.In line with Myers (1984) pecking order theory the funding is prefer hierarchy, firstly to invest personal equity, secondly try to reinvest by issuing more shares, finally to abstain outside debt.

Agency cost Theory in line with previous evidence the theories on capital structure carry an assumption that managers acts for the interest of shareholders and they are perfectly aligned with shareholders (Brendea 2011).According to Jensen and Mekling (1976) "If both parties to the association are efficacy maximizers, there is a good reason to believe that the agent will not always act in the best interests of the principal". In contrast mostly researchers gave some adverse views in modern age of agency theory. Furthermore some managers prefer to invest free cash in bad opportunities so these aligned can't match with shareholder interest Jenson &Mekling (1976).To control this agency costs between the two parties, firms tend to increase their debt levels with the objective of controlling the investment opportunities (Jensen, 1986; Stulz, 1990).

Determinants of Working Capital at Firm Level

Leverage.

In line with previous research the high risk premium have to pay by companies which have high leverage ratio in case of managing cost working capital.Furthermore when firms increase their leverage the relationship between leverage and working capital is reported significant negative (Chiou2006, Rahman and Nasr 2007). This suggests that for higher leverage levels the more attention has to be made by the firms to reduce capital related to current assets. The requirements of lower

working capital seek by all those firms have high level of leverage. According to Nazir and Afza (2009), there is less availability of internal resources in high levered firms and could be low capital for daily operations.

Liquidity

To meet the financial obligations liquidity is an attribute that signifies the capacity as and when require.Liquidity deals with the two important components of working capital current assets and current liabilities, it is a routine function of finance.Other liquid assets are convertible in money and current assets are considered as money in liquidity concept.In a competitive market any firm must be able to pay its all liabilities and also have a sound base of working capital for long period.

Profitability.

Deloof (2003) profitable firms minimize the inventory and also take favorable credit terms from the supplier.Furthermore he also examined the relationship between working capital and profitability argued that there is adverse relationship between profitability and working capital. However same like the inverse relationship found between the profitability and working capital by M.A. Eljelly (2004).In contrast some evidence from previous literature also reported the positive relationship between profitability and working capital.In line with Amman stock exchange positive significant relationship reported by the Bana (2012), between the profitability and working capital. It can be a reason that the profitable firms often careless about their working capital management.

Firm size: The larger firms may enjoy the bargaining power with customer and supplier as compare to smaller it indicted that the negative relationship exist between the firms size and working capital Moss and Stein 1993).There is positivesignificant relationship between firm size and working capital management supported by (Chiou 2006; and Banos Caballero 2010).In line with Berger and Udell (1998) there is positive significant relationship between the firm size and working capital. They also argued that large amount of funds available in older firms than smaller, that firm can also finance with lower financial cost.

Determinants of working capital at sector level

Munificence.

Munificence shows the growth of the sectors. To check the sectoral effects on working capital the factor munificence represent the growth of sectors in non-financial firms. It defined that the ability of environment to maintain persistent in growth Dess and Beard (1984).According to

Almazan and Molina (2005) the low munificence sectors / industries have less opportunities in ordinary environment, in contrast the high growth sectors have high munificence in environment. Furthermore greater disparity in capital structure of those firms which have larger growing opportunities (Almazan and Molina 2005).The relationship between the munificence and leverage is reported by various researchers, the leverage effects the capital structure (Nazir and Afza 2009; Naveed M. 2015).

Dynamism.

Dynamism represent the strength of sectors.Many researchers reported the term dynamism in same phenomena. According to Dess and Beard (1984)due to dynamic reflection in the environment the external environment became change. According to Kayo and Kimura (2011), with in a specific sector firms share same properties because they expect to operate with same environment. The firms operating in stable environment are consider low stability as compared to highly growth firms Smith (2014).He also argued that the uncertainty and strength of environment is replicate by dynamism.According to Naveed M, (2015) due to systemic risk, the environment of the firms in specific industry become unstable. Furthermore he argued that highly instability become due to highly dynamisms.

HHI.

HHI is basically division of industries into two or three different level. It can be divide low and high level industries or top level middle level and lower level according to capitalization.To check the sectoral effects on working capital the study categorized industries into two differentlevel.Some researchers defined as HHI for the one year exceeds the median of industry, otherwise the competitive industry can be considered.The firms working capital requirements always dependent upon the industry Hawawini Viallet and Vora (1986).Furthermore in the light of Hill (2010) in response of financing and operating conditions the firm in concentered industry are likely to influence the management of working capital. Finally accordance with Moeinaddin Nayebzadeh and Ghasemi (2013), they supported that HHI is easy, strong and important method of calculating the concentration level of industries.

Theoretical Framework

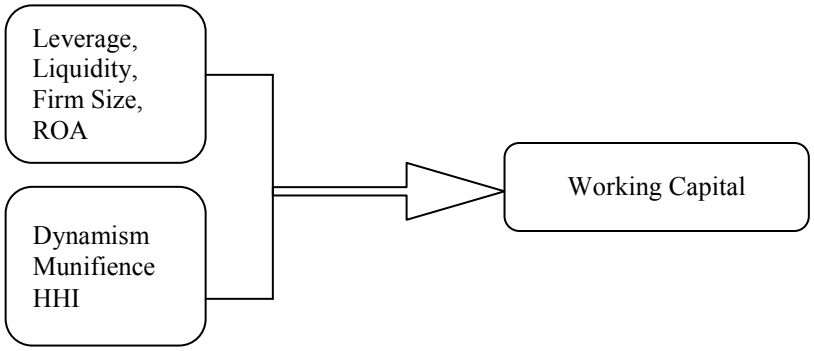

Figure 1: Theoretical Framework

Hypothesis of the study

H1 There is significant positive relation among profitability and working capital.
H2 There is significant negative relation among leverage and working capital.
H3 There is significant positive relation among liquidity and working capital.
H4 There is significant positive relation among firm size and working capital.
H5 There is significant positive relation among munificence and working capital.
H6 There is significant negative relation among dynamism and working capital.
H7 There is significant negative relation among HHI and working capital.

Research Methodology

In the light of some previous evidence like books, articles etc. for the methods of investigation, mostly researchers have found that the theory of knowledge position for this study is best fit for analysis, this approach basically tend to focus on deductive approach in which quantitative method is used for data analysis.It is proved that these models are general rules that provide a complete direction for investigation and quantitativedata analysis.Same likequantitative research is systematic empirical investigation for observing through numerical, statistical etc. particularly in the field of social sciences and sciences.In contrast qualitative research focus on primary data like questionaries' interview

and discussion etc.The quantitative research not only remained the discussion between some researchers, it is also proved and used by many researchers to understanding the research problems through numerically tendency of quantitative data like (Mertens 2003, Newman and DeMarco 2003 Punch 1998).In the light of above discussion this study focused on quantities research design.

Data Sources/ Duration

The data for this study consist non-financiallisted firms for the time period of 2005-2017.He study set sensitivity and sectoral analysis for the determinants of working capital of non-financial listed firm's evidence from Pakistan.The study use panel data analysis for textile sector, sugar sector, energy sector etc. from developing market like Pakistan.The data used are derived from an analysis of the financial statements of non-financial listed firms on the Pakistan Stock Exchange issued by the State Bank of Pakistan, Business Recorder.

Tools of analysis

The study firstly employs the diagnostic testing to check the health of determinants of working capital at different level. The study diagnostic testing include descriptive summary of the determinants and correlation matrix etc. Furthermore study also employs the ordinary least square regression. Accordance with Vevan and Danbolt (2004) due to time existence and fixed effects the OLS become biased.

Finally the study will further conduct the fixed effect vs random effect model; the individual model will be select on the basis of Hausman test. The Hausman test firstly by using likelihood ratio differentiates the common vs fixed model. Furthermore the fixed vs random model is select on the basis of Hausman test. In fixed effect model, slope is held constant and control for unobserved heterogeneity. However, according to the rational for choosing the fixed effect model is that, firm operating within different sectors has unique characteristics.The study used panel data analysis. The Panel data consist on time series and cross section, the panel data includes number of firms or countries one side and series of time period on other side. In short combination of time series and cross section is called panel.

To measure the uncertainties the sensitivityanalysis is a unique technique in modern world. It can check the effects on model and also further proceed by checking changes in various parameters.Sensitivity analysis helps in determining the factors which are consider the key drive for model Eriksson and Hede (1999).The study conduct two different periods pre and post window for making the sensitivityanalysis of

working capital determinants.To checking the effects of different economic recessions the study remain tapped with different sectoral effects during making sensitivity analysis.

Table 1 Formulations for the Determinants of working Capital

Determinants	Formulations
Working Capital	CA – CL C=Current A = Assets L = Liabilities
Leverage	Debt to equity ratio
Sales Growth	(P0 -Pi / Pi) = P0present – Past / Past
Profit	ROA
Firm Size	Natural log of sales
Munificence	Regressing Time against the sales of sector over the period of study and taking the ratio of slop coefficient to the mean value of sales over the same period.
Dynamism	Standard error of munificent slope coefficient divided by the mean value of sales over the same period.
HHI	By adding squares of percentage of market share possessed by firm in each sector.

Econometric Equation

$$WCR\ imt = \beta 0 + \beta 1\ (Lev)it + \beta 2\ (LIQ)\ it + \beta 3\ (PRO)\ it + \beta 4\ (FS)\ it + \beta 5\ (MUNIF)\ it + \beta 6\ (Dayn)\ it + \beta 7\ (HHI)\ it + \mu_i + \mu_m$$

$$WCR\ imt = \beta 0 + \beta 1\ (Lev)\ it + \beta 2\ (LIQ)\ it + \beta 3\ (PRO)\ it + \beta 4\ (FS)\ it + \beta 5\ (MUNIF)\ it + \beta 6\ (Dayn)\ it + \beta 7\ (HHI)\ it + \mu_i + \mu_m + \varepsilon it$$

Results and Discussion

Table 2 Descriptive Statistics

Variable	Mean	Median	S.D.	Min	Max
WC	1.87	1.36	2.77	-9.91	28.1
LEV	0.632	0.232	2.10	-3.20	44.8
LIQ	0.0709	0.0279	0.0898	0.0210	0.386
PRO	0.545	0.449	2.27	-38.9	18.2
FS	2.03	0.737	2.65	0.654	9.95
MUNI	0.387	0.292	0.228	0.232	1.31
DAYN	0.0788	0.0380	0.440	-0.987	9.81
HHI	0.0258	0.0257	0.00791	0.0210	0.111

Table 2 results show the diagnostic testing one descriptive summary for the determinants of working capital at two different level. The dependent variable is working capital and other explanatory factors are leverage, sales growth, profitability, operating cash flow and firm size at firm

level. Furthermore at sector level explanatory factors are munificence, dynamism and HHI etc.The mean value of working capital is 1.87 that shows the variation in the factor. However the standard deviation is 2.77 that show very low risk level in the factor or dependent variable like working capital. Furthermore the minimum and maximum values for working capital are -9.91 and 28.1. The median is 1.36 that exists between the minimum and maximum figures. Same like the mean value of leverage is 0.632. The standard deviation is 2.10 that also show the low level of risk in leverage. However the minimum and maximum figures are reported -3.20 and 44.8. In line with the median is 0.232 that exist between the minimum and maximum values. The mean value of Liquidity is 0.0709 that shows the variation in the factor.

However the standard deviation is 0.0898 that shows very low risk level in the factor or independent variable. Furthermore the minimum and maximum values for working capital are 0.0210 and 0.386. The median is 0.0279 that exist between the minimum and maximum figures.Same like the mean value of profitability is 0.545. The standard deviation is 2.27 that also show the low level of risk in leverage. However the minimum and maximum figures are reported -38.9 and 18.2. In line with the median is 0.449 that exist between the minimum and maximum values. The mean value of operating cash flow is 6.26 that show the variation in the factor. However the standard deviation is 3.13 that show very low risk level in the factor or dependent variable like working capital. Furthermore the minimum and maximum values for working capital are -11.0 and 11.5. The median is 7.28 that exist between the minimum and maximum figures.

Furthermore the mean value of firm size is 2.03. The standard deviation is 2.65 that also show the low level of risk in firm size. However the minimum and maximum figures are reported 0.654 and 9.95. In line with the median is 0.737 that exist between the minimum and maximum values. At sector level the mean value of munificence is 0.387 that shows the variation in the factor. However the standard deviation is 0.228 that shows very low risk level in the factor or dependent variable. Furthermore the minimum and maximum values for working capital are 0.232 and 1.31. The median is 0.292 that exist between the minimum and maximum figures.

Secondly the mean value of dynamism is 0.0788. The standard deviation is 0.44 that also shows the low level of risk in dynamism. However the minimum and maximum figures are reported -987 and 9.81. In line with the median is 0.0257 that exist between the minimum and maximum values. Finally at sector level HHI mean value is 0.0258, the standard deviation is 0.00791 that shows very low level of risk in factor,

minimum and maximum values are 0.0210 and 0.111. The median is 0.0257 that exist between minimum and maximum values.

Table 3 Correlation Matrix

WC	LEV	LIQ	PRO	FS	MUNIF	DAYNM	HHI	
1.0000	-0.1438	-0.3469	0.0083	-0.3373	-0.3465	-0.0947	-0.0404	WC
	1.0000	0.3707	-0.0437	0.3766	0.3978	0.007	0.1057	LEV
		1.0000	0.2547	0.6275	0.6193	0.1992	0.0962	LIQ
			1.0000	0.5264	-0.6499	-0.6686	-0.1112	PRO
				1.0000	0.4521	0.6584	0.1791	FS
					1.0000	0.5421	0.2009	MUNIF
						1.0000	0.25471	DYNM
							1.0000	HHI

Table 3 shows the results of correlation matrix for the determinants of working capital of Pakistani non-financial listed firms across sectors. The correlation matrix basically highlight the issue of multicollinearity. The issue of multicollinearity exist when two or more variables shows the same phenomena. It can be identify when two variables give same results or match the figure between two factors more than 0.70%. In short when two variables correlate more than 0.70% it means issue of multicollinearity exist. If issue exist then one variables from both must be excluded. In light of above results the highest figure in the table is 0.6275. It indicate that there is no single evidence for the issue of multicollinearity. Finally there is no single value more than 0.70% it means no issue of multicollinearity.

Table 4 Ordinary Least Square Model (OLS) and Fixed effects Model

	OLS Model		Fixed effects Model	
Variables	Coefficient	Prob.	Coefficient	Prob.
MUNI	0.63448	0.1216	0.638469	0.0001
DAYN	0.324406	0.0228	1.554739	0.0001
HHI	-4.077486	0.0041	-0.016536	0.2349
LEV	-0.001173	0.2023	-0.000285	0.7946
FS	0.012821	0.0417	0.024244	0.0008
PRO	0.922597	0.0001	1.192107	0.0001
LIQ	-0.057945	0.0033	-7.998041	0.0001

Table 4 shows the results of sensitivity analysis for the determinants of working capital at two different levels. Firstly at sector level factors are munificence, dynamism and HHI etc.Secondly at firm level factors are leverage, firm size, and profitability and liquidity etc. are reported. The simple OLS regression and fixed effects model both results are combined in Table 4.

In the light of results of Table 4 the coefficient for munificence is positive and its p-value is insignificant by using OLS regression.It shows that no relationships exist. In line with fixed effects model the sign of coefficient is positive and p-value is significant. The relationship between working capital and munificence is significant positive. Furthermore greater disparity in capital structure of those firms which have larger growing opportunities (Almazan & Molina 2005).The relationship between the munificence and leverage is reported by various researchers, the leverage effects the capital structure (Nazir & Afza 2009; Naveed M. 2015).

The p-value of dynamism is insignificant and its sign of coefficient is positive n both models. It indicates that there significant positive relationship between the dynamism and working capital. According to Kayo and Kimura (2011), with in a specific sector firms share same properties because they expect to operate with same environment. The firms operating in stable environment are considering low stability as compared to highly growth firms Smith (2014). He also argued that the uncertainty and strength of environment is replicate by dynamism. According to Naveed M, (2015) due to systemic risk, the environment of the firms in specific industry becomes unstable. Furthermore he argued that highly instability become due to highly dynamisms.

The sign of coefficient for HHI is negative and its p-value is insignificant with the results of fixed effects model. It indicate that no relationship exist between the factors.Incontrast HHI shows the p-value significant and sign of coefficient negative. It also indicate that there is significant negative relationship exist between HHI and working capital.Furthermore in the light of Hill (2010) in response of financing and operating conditions the firm in concentered industry are likely to influence the management of working capital. The firm in concentered industries with greater market share should be able to minimize the requirements of working capital. Finally accordance with Moeinaddin Nayebzadeh and Ghasemi (2013), they supported that HHI is easy, strong and important method of calculating the concentration level of industries.Furthermore some factors at firm level shows that the p-value of leverage is insignificant and its sign of coefficient is negative in both models. It indicates that there is no relationship exists between leverage and working capital. In line with previous research the high risk premium have to pay by companies which have high leverage ratio in case of managing cost working capital. Furthermore when firms increase their leverage the relationship between leverage and working capital is reported significant negative (Chiou 2006, Rahman and Nasr 2007).

This suggests that for higher leverage levels the more attention has to be made by the firms to reduce capital related to current assets.In contrast the coefficient for firm size is positive and its p-value is significant. The relationship between firm size and working capital is significant positive. There is positive significant relationship between firm size and working capital management supported by (Chiou 2006; and Banos Caballero 2010).In line with Berger and Udell (1998) there is positive significant relationship between the firm size and working capital. They also argued that large amount of funds available in older firms than smaller, that firm can also finance with lower financial cost.
Another factor like Profitability shows the p-value significant and sign of coefficient positive. It also indicate that there is significant positive relationship exist between Profitability and working capital.In contrast some evidence from previous literature also reported the positive relationship between profitability and working capital. It can be a reason that the profitable firms often careless about their working capital management.Finally at firm level liquidity shows the sign of coefficient negative and p-value is highly significant. It indicate that there is significant negative relationship exist between the liquidity and working capital.Liquidity deals with the two important components of working capital current assets and current liabilities, it is a routine function of finance. Other liquid assets are convertible in money and current assets are considered as money in liquidity concept. In a competitive market any firm must be able to pay its all liabilities and also have a sound base of working capital for long period.

Table 5 Sectoral Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DAYN	-4.541324	2.531132	-1.794187	0.0531
HHI	18.51514	4.428061	4.181321	0.0001
MUNI	2.328826	0.992576	2.346244	0.0192
R-squared	0.179237			
Adjusted R-squared	0.176629			
Durbin-Watson stat	2.010296			
Prob(F-statistic)	0.000000			

Table 5 shows the results for the sectoral level determinants of working capital like (munificence, dynamism and HHI. In the light of above results R-square is 0.179237 Adjusted R-square is 0.176629, the probability of F-statistics is significant and D-Watson is near about 2.
In the light of above results the p-value of dynamism is significant 0.0531 and its sign of coefficient is negative-4.541324. It indicates that there significant negative relationship between the dynamism and

working capital. According to Kayo and Kimura (2011), with in a specific sector firms share same properties because they expect to operate with same environment. The firms operating in stable environment are considering low stability as compared to highly growth firms Smith (2014). He also argued that the uncertainty and strength of environment is replicate by dynamism. According to Naveed M, (2015) due to systemic risk, the environment of the firms in specific industry becomes unstable. Furthermore he argued that highly instability become due to highly dynamisms.

Furthermore the p-value of HHI is highly significant0.0001 and sign of coefficient positive with 18.51514. It indicate that there is significant positiverelationship exist between HHI and working capital.Furthermore in the light of Hill (2010) in response of financing and operating conditions the firm in concentered industry are likely to influence the management of working capital. The firm in concentered industries with greater market share should be able to minimize the requirements of working capital. Finally accordance with Moeinaddin Nayebzadeh and Ghasemi (2013), they supported that HHI is easy, strong and important method of calculating the concentration level of industries.

In contrast the coefficient for munificence 2.328826is positiveand its p-value is significant 0.0192. The relationship between working capital and munificence is significant positive. Furthermore greater disparity in capital structure of those firms which have larger growing opportunities (Almazan and Molina 2005).The relationship between the munificence and leverage is reported by various researchers, the leverage effects the capital structure (Nazir and Afza 2009; Naveed M. 2015).

Table 6 Sensitivity Analysis

Variables	Pre period		Post Period	
Variables	Coefficient	P-values	Coefficient	P-Values
Lev	−0.042426	<0.0001	-0.001719	0.6629
LIQ	−7.438621	0.0039	1.834755	0.0026
PRO	−0.009897	0.7577	0.659901	0.0001
FS	0.0461814	0.0013	0.055226	0.0001
MUNI	−1.689851	0.1049	0.678884	0.0033
DAYN	−0.04189	0.5113	0.000670	0.9342
HHI	4.295442	0.2445	-9.517173	0.0245
	R-SQR	0.439615	R-SQR	0.230590
	ADJ-RSQR	0.433941	ADJ-SQR	0.217121
	D-Watson	1.95320	D-W	1.916241

Table 6 shows the results of sensitivity analysis for the period of 2005-2007 as pre and 2009-2016 as post financial period.The results are captured through simple OLS regression. The determinants of working capital at firm level are (leverage, liquidity, profitability and firm size)at sector level are (munificence, dynamism and HHI). The study divide period into two groups and make sensitivity analysis to check the impact of different factors in different economic recession. In the light of above results R-square is 0.439615 in pre and 0.230590 in post Adjusted R-square is 0.433941 in pre and 0.1217121 in post period, the probability of F-statistics is significant and D-Watson is near about 2.

In the light of above results the p-value of leverage is highly significant 0.0001 in pre economic period and its sign of coefficient is negative -0.042426. It indicates that there significant negative relationship between the leverage and working capital in pre economic period. In line with previous research the high risk premium have to pay by companies which have high leverage ratio in case of managing cost working capital. Furthermore when firms increase their leverage the relationship between leverage and working capital is reported significant negative (Chiou 2006, Rahman and Nasr 2007). This suggests that for higher leverage levels the more attention has to be made by the firms to reduce capital related to current assets.

In contrast the p-value of leverage is insignificant 0.6629 in post economic period and its sign of coefficient is negative -0.001719. It indicate that there is no relationship exit between leverage and working capital in post period.Furthermore the p-value of liquidity is significant 0.0039 in pre economic period and its sign of coefficient is negative -7.438621. It indicate that there significant negative relationship between the liquidity and working capital in pre economic period. To meet the financial obligations liquidity is an attribute that signifies the capacity as and when required. Liquidity deals with the two important components of working capital current assets and current liabilities; it is a routine function of finance. Other liquid assets are convertible in money and current assets are considered as money in liquidity concept. In a competitive market any firm must be able to pay its all liabilities and also have a sound base of working capital for long period.

However the p-value of liquidity in post economic period is also significant but its sign of coefficient is positive 1.834755. It indicate that there is positive significant relationship exist between liquidity and working capital in post period.To meet the financial obligations liquidity is an attribute that signifies the capacity as and when required. Liquidity deals with the two important components of working capital current assets and current liabilities; it is a routine function of finance. Other

liquid assets are convertible in money and current assets are considered as money in liquidity concept. In a competitive market any firm must be able to pay its all liabilities and also have a sound base of working capital for long period.

In contrast the coefficient for profitability -0.009897 is negative and its p-value is insignificant 0.7577.It indicate that there is no relationship exist between profitability and working capital in pre period. Adversely in post period the p-value is highly significant with 0.0001 and sign of coefficient is positive. It indicates that there is significant positive relationship exist between profitability and working capital. Some evidence from previous literature also reported the positive relationship between profitability and working capital. In line with Amman stock exchange positive significant relationship reported by the Bana (2012), between the profitability and working capital. It can be a reason that the profitable firms often careless about their working capital management.

Furthermore the sign of coefficient for firm size 0.0461814 is positive and its p-value is significant 0.0013. The relationship between working capital and firm size is significant positive in both periods. There is positive significant relationship between firm size and working capital management supported by (Chiou 2006; and Banos Caballero 2010).In line with Berger and Udell (1998) there is positive significant relationship between the firm size and working capital.

Finally at sector level the sign of coefficient for munificence -1.689851 is negative and its p-value is insignificant 0.1049. It indicate that there is no relationship exist between munificence and working capital in pre economic period. In contrast in post period the sign of coefficient for munificence is positive 0.678884 and its p-value is significant. It indicates that there is significant positive relationship exist between munificence and working capital. Furthermore, greater disparity in capital structure of those firms which have larger growing opportunities (Almazan and Molina 2005). The relationship between the munificence and leverage is reported by various researchers, the leverage effects the capital structure (Nazir and Afza 2009; Naveed M. 2015).

In the light of above results the p-value of dynamism is insignificant 0.5113 in pre and 0.9342 in post period, its sign of coefficient is negative -0.04189 in pre but positive in post period 0.0000670. It indicates that there is no relationship exists between the dynamism and working capital. According to Kayo and Kimura (2011), with in a specific sector firms share same properties because they expect to operate with same environment. The firms operating in stable environment are considering low stability as compared to highly growth

firms Smith (2014). He also argued that the uncertainty and strength of environment is replicate by dynamism. According to Naveed M, (2015) due to systemic risk, the environment of the firms in specific industry becomes unstable. Furthermore he argued that highly instability become due to highly dynamisms.

Another factor like HHI shows the p-value insignificant 0.2445 and sign of coefficient positive. It indicates that there is significant positive relationship exist between HHI and working capital. In contrast the sign of coefficient for HHI is negative -9.517173 and its p-value is 0.0245. It indicates there is significant negative relationship exist between HHI and working capital in post period.

Furthermore in the light of Hill (2010) in response of financing and operating conditions the firms in concentered industry are likely to influence the management of working capital. The firm in concentered industries with greater market share should be able to minimize the requirements of working capital. Finally accordance with Moeinaddin Nayebzadeh and Ghasemi (2013), they supported that HHI is easy, strong and important method of calculating the concentration level of industries.

Findings

In line with research objective one the determinants of working capital shows highly significant relationship. The liquidity, profitability shows negative significant relationship with working capital. The firm size shows positive significant relationship with working capital. Some factors at sector level munificence and dynamism also shows negative relationship with working capital, the HHI shows positive relationship with working capital.In line with research objective two at sector levelthe dynamism is significant and its sign of coefficient is positive. It indicate that there significant positive relationship between the dynamism and working capital.In contrast the coefficient for munificence is positive and its p-value is significant. The relationship between working capital and munificence is significant positive. According to Kayo and Kimura (2011), with in a specific sector firms share same properties because they expect to operate with same environment. The firms operating in stable environment are considering low stability as compared to highly growth firms Smith (2014). He also argued that the uncertainty and strength of environment is replicate by dynamism. According to Naveed M, (2015) due to systemic risk, the environment of the firms in specific industry becomes unstable. Furthermore he argued that highly instability become due to highly dynamisms.Another factor like HHI shows the p-value significant and sign of coefficient negative. It also indicate that there is

significant negative relationship exist between HHI and working capital.Finally in line with research objective three the determinants at firm level leverage shows significant relationship in pre economic period, in contrast the leverage in post period is insignificant. Furthermore the liquidity shows highly significant relationship with working capital. The profitability shows insignificant in pre period, in contrast the profitability in post period shows highly significant relationship with working capital. Finally at firm level one more factor like firm size shows highly significant relationship with working capital.

Conclusion

It is concluded that this study tend to focus on the sensitivity analysis for the determinants of working capital an evidence from the developing market like Pakistan. The study makesensitivity analysis by dividing the whole period of data set into two parts pre and post periods. He pre period consist before the financial crises period and post consists on after the financial period. The factors have different impact in different economic recessions. However study used non-financial listed firms from Pakistan stock exchange.The determinants of working capital in this study examined at two different level.However multi tools for data analysis are selected. For the diagnostic testing like descriptive summary and correlation Metrix are used. Furthermore OLS regression and fixed model also selected for analysis. The Hausman test is run to differante the random or fixed effects. Firstly at firm level, like leverage, firm size, liquidity and ROA etc. Secondly at sectoral level like munificence, dynamism and HHI etc. The sectors have importance in economic development of the Pakistan. The study remained tapped textile and sugar sector of Pakistan. In short the involvement of sectors can't be ignored in economic development of Pakistan.The determinants at firm level showshighly significant relationship with working capital. Same like determinants at sector level like munificence and HHI shows significant impact on working capital.The study excluded the delisted, or firm in the form of merger and acquisition.The study is beneficiary for the students, researchers, investors and other finance managers for working capital management.Furthermore in future the dynamic modeling (GMM) with updated data set can be used to examine the impact of some more factors on working capital.

Limitations

The study is limited to non-financial sectors, the financial sector or other sector not part of this study. Same like study limited to non-financial listed firms only, the firms in the form of delisted from stock exchange,

the firms in the form of merger and acquisition are not included. Furthermore study remained tapped with highly capitalized firms from different sectors. Finally study examine the working capital determinants from developing market like Pakistan, the emerging and other markets are not tapped.

Future Recommendations

It is recommended that the dynamic modeling (GMM) can be used in future to examine the determinants of working capital at different level. However the variables can be extended at three different level firm, sector and country level can be added. Researchers in future can use latest data set to examine the determinants of working capital. The sectors of the study can be extended, across the sector and across the countries data set can be used.

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