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WORKING CAPITAL MANAGEMENT EFFICIENCY OF NON-FINANCIAL INDUSTRY IN PAKISTAN AND ITS EFFECT ON FINANCIAL PERFORMANCE: PRE AND POST COVID ANALYSIS

By

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Table of Contents

ABSTRACT

The purpose of this research is to explore the impact of working capital management (WCM) on the financial performance of firms that are listed on the Pakistan Stock Exchange (PSX). For this purpose we have taken years ranging from 2014 to 2019 and the years from 2020-2021 of the frequency of quarterly basis that covers the before and during the COVID pandemic. Thirty companies were taken from six non-financial sectors of Pakistan. The independent variables that have been used for this research includes average collection period (ACP), average payment period (APP), inventory turnover in days (ITID), leverage (LV), liquidity (LQ), firm size (SZ), interest rate (SZ) and large scale manufacturing (LSM) while our dependent variables that would show the firm performance include return on equity (ROE) and return on asset (ROA). The results that were concluded from the regression model ACP, ITID, SZ, LV and IR has a significant impact on the ROE while during the pre-covid period ACP, APP, ITID, SZ, LQ and IR has significant impact on ROE while ACP, ITID, LV and LQ has a significant impact on ROA while post-covid ACP, APP, ITID, SZ, LQ and IR has a significant impact on ROA. During the research it was noted that post period only one independent variable was positively significant with ROA and ROE that was LV.

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1. INTRODUCTION

1.1 BACKGROUND OF STUDY

Working Capital Management is very crucial for businesses in their day-to-day operations. Dynamic management of WCM operations is important for a successful business. The need of efficient working capital management mechanism impacts the payments, inventory management, cash collection, sales conversions and many more factors which eventually contribute to the betterment of financial performance of a firm. While growth of the firm is highly dependent on increasing profitability, the profitability is very much dependent on an efficient working capital management system.

As stated by Guthman and Dougall (1948) current assets less current liabilities were known as working capital. The Working capital is the difference between resources in cash or readily convertible into cash current assets and organizational commitments for which cash will soon be required current liabilities Filbeck, G. and Krueger, T.M. (2005). Taleb, Zoued, and Shubiri (2010) emphasized the significant role of the WCM because it affects directly the profitability and liquidation of the firm. Efficient management of working capital is a fundamental part of the overall corporate strategy (Padachi, 2006). Most non-financial sector industries in Pakistan base their financial policies and corporate strategies on the primary bases of their overall working capital management potential and capability. While evaluating the impact of working capital management on financial performance there are multiple factors to look upon which creates the basis of the complete financial performance such as assets, liabilities, revenue, expenses, equity and overall profitability.

The efficiency of Working Capital Management is not only restricted to the liquidity of a business but it also plays a vital role in impacting the overall adequacy, solvency and long-term presence of the firm. The companies having less cash in hand makes the business survival trembling however too much investment in short-term brings unprofitable returns. Many firms are unable to meet their current and short-term obligations because they do not have the right mix of operational assets, cash and inventory. Compromising on Working Capital adequacy results in a firm's inability to expand its operations, which in turns results in hampering growth Oladipupo and Okafor (2013).

The effect of working capital management efficiency on financial performance has been tested by multiple authors including Muhammad, Rehman and Waqas (2016); Bui (2016); Tu and Nguyen (2016); Gul, Khan, Rehman, Khan, Khan, and Khan (2013); Vural, Sokmen, and Cenenak (2012), Sharma and Kumar (2011); Lazaridis and Tryfonidis (2006); Deloof (2003); Shin and Soenen (1998) but all the researches have focused into different contexts and aspects of WCM which creates an inconclusiveness in the result and in order to shed more visibility of WCM efficiency impact particularly in regards to the WCM in non-financial sector of Pakistan this research needs to be carried out.

This research examines the impact of WCM efficiency in non-financial sector of companies listed in the Pakistan stock exchange from sectors including cement, chemical, sugar, automobile, steel, and textile and further its effect on the financial performance of companies listed in these sectors for the period 2014 to 2021. After the examination of it the paper gives recommendation on improving the efficiency of WCM to intensify the performance of all the above listed sectors on the Pakistan stock exchange. The paper examines all components of WCM which may affect the financial performance of listed companies in the Pakistan stock exchange.

1.2 PROBLEM STATEMENT

In managing financial aspects at a corporation, Working Capital Management is vital in meeting the current and future needs of businesses and fulfilling the financial obligations towards the creditors. A firm facing liquidity challenges may find it hard to procure the required inventory when needed, pay the creditors when liabilities are due and meet the expectation of shareholders who prefer cash dividend. This research aims to identify how critical the role of a strong Working Capital Management plays in improving performance.

1.3 OBJECTIVES

The long-term goal of this research is to carry out a legitimate effect of working capital management efficiency on performance of companies in non-financial sector of Pakistan. Performance here is defined as a combination of both the non-financial and financial aspects of a company. The primary objective of this research is to provide a comprehensive review of industry outlook and literatures in relation to WCM efficiency's effect on organizational performance and outline a conceptual framework for working capital management efficiency. The sub-objectives of study are:

2. To provide a comprehensive review of factors affecting performance of a company on financial basis derived relatively from WCM
3. To develop a performance classification method for easier identification and modeling of non-financial sector companies
4. To review ongoing market practices and researches in regards to WCM
5. To outline a conceptual framework for WCM efficiency and its effect on financial performance of non-financial industry in Pakistan
6. To carry out the impact of COVID-19 on financial performance with reference to WCM efficiency

1.4 SIGNIFICANCE OF STUDY

The major significance of the study affects a larger audience as it identifies the core characteristics of working capital which can actually help in corporations to focus in managing the right aspect at the right time. The research gives outlook on the impact of cash conversion cycle, average collection period, Inventory turnover and average payment period which can be highly crucial for both goods and service sector businesses as the impact in measuring working capital in such regard can help maximize the firm's financial performance. The impact can help the internal management decision making in regards to evaluating the working capital with regards to all the upholding current assets and current liabilities while an advantage to enhance return on equity can benefit the larger number of shareholders. The novel significance of this study broadens up to multiple dimensions as the research is focusing on the post covid effect of the companies present in the non-financial sector of Pakistan. The pre-covid to post-covid change in working capital and WCM is primarily highlighted by the outcomes of the study. The previous researches done in such regard has majorly focused in singular area of profitability in regards to WCM efficiency not specific to non-financial sector of Pakistan while in regards to a similar research Afza, Talat & Nazir, Mian Sajid. (2011) has carried out a hypothesis testing for cement sector of Pakistan with carrying data range from year 1989-2008.

2. LITERATURE REVIEW

INTRODUCTION

This chapter thoroughly reviewed all the literature consistent with the objectives of this research. This literature covers the theoretical review, the factors of financial performance, and empirical review of relevant past studies. It at the end highlights a summary of all the literature being done in this regard with respect to the research gap being evaluated in this study.

2.1 THEORETICAL REVIEW

2.1.1 PECKING ORDER THEORY

According to Zhang, X. and Zhu, Y. (2021) Capital structure decisions are among the most significant financial decisions that firms face. Working capital is an integral part of company's overall capital structure. The Pecking Order Theory emphasized on the fact that firms determine how to finance their investments in a defined order Donaldson (1961). POT's extension was attributed to the concept of asymmetric information between managers and investors (Lucas & McDonald, 1990). POT in case of short-term financing becomes more relevant to the working capital. Donaldson (1961) emphasized on the fact that companies tend to keep enough financial liquidity to pay off its short-term obligations during the regular business flow. Working capital efficiency is indicated more prominently through the cash conversion cycle which pops out to be one of the most prominent factors that firms cash requirement from external sources of funding Soenen (1993). Ajibolade and Sankay (2013) argued that in case of limited internal source of funding an organization following the principles of POT would initially opt to invest in long- term capital investments instead of fulfilling the WC needs, which would primarily become a hindrance to achieve maximum efficiency in managing working capital.

2.1.2 TRADE OFF THEORY

The trade off theory has a dispute in terms of its interpretation Gill, Biger & Mathur (2010) and Abuzayed (2012) suggested that the trade off upholding positive working capital would enhance firm's performance while Eljelly (2004), Lazaridis & Tryfonidis (2006), Raheman & Nasr (2007), Mansoori & Muhammad (2012) and Wasiuzzaman (2015) argued that the trade off upholding negative working capital would enhance firm's performance. These arguments can be further evaluated by their financial implications between firms which holds a significant amount of working capital versus the companies which hold a limited amount of working capital. Deloof (2003) studied that companies having high working capital investments tend to bear more unnecessary inventory costs which increases risk for the firm in form of bad debt and could possibly bring a negative impact to the overall profitability while if a company has a limited amount of working capital investments, this could lead to loss of potential sales due to inadequate supplies. Trade-off risk aversion in regards to return aligns three approaches to working capital management. Aggressive, conservation and moderate which respectively maintains balance between profitability, liquidity and solvency Weinraub & Visscher (1998).
Short-term investments with excessive risks tend to book higher returns with a possibility to face

higher liquidity risk as well as firms might find shortage on cash to fulfill operational expenditures. While investments pertaining to lower risk might suffer lower returns Lee et.al (2016). The managers in such trade-off tend to maintain the balance of working capital portfolio.

2.1.3 AGENCY THEORY

Ling, Sim & Yie, Shin & Ali, Azlan. (2018) studied that the central importance of agency theory lies within the financial manager as the idle person is capable of determining the optimum level of working capital in order to carry out an efficient financial budget of a firm while reducing idle resources and maximizing shareholder's wealth Gill & Shah (2012). In theoretical terms, efficient working capital management has tendency to maximize revenue, as assets supposedly upholds capability to earn extra returns on its investment when short-term debt obligations are payed. Aktas & Petmezas (2015) studied that due to presence of empirical evidence WCM has direct impact on the firm's performance.

2.1.4 FACTORS OF FINANCIAL PERFORMANCE

Kabethi and Wanjiku, L. (2013) suggested that for every firm, it's important to maintain a balance between profitability and liquidity. The importance for both factors hold equal importance because if a firm doesn't maximize profit or care about it, it would not see any growth yet would not sustain the business in the long term, simultaneously if the liquidity is not being given same importance the firm might face insolvency at some point. For this particular reason the finance managers should give their complete and undivided attention towards WCM as it does affect the profitability of the firm Eljelly (2004).

Companies could be highly profitable but if they do not convert their cash from operations within the same operating cycle, they'll have to borrow cash to fulfill their working capital requirements Padachi (2006). Putting in more investments in working capital is inescapable as it gets assured in terms of delivery of goods and services to the end user and in the same manner does reflect upon the profitability. Barriers in supply chain can extend the cash operating cycle, which at one point may can put a positive effect on profitability in terms of increased sales but at another point may can adversely impact the profitability as the benefit of holding more inventory is waived off against more inventory bearing cost and granting trade credit to endusers.

Management of working capital is important to the financial health of businesses of all sizes Kabethi and Wanjiku, L. (2013). The amount invested in working capital management are relatively high in proportion to the total employed asset for the firm therefore it is important to make use of the fund in more effective and efficient way. Working capital management primarily helps companies to fulfill their short-term financing requirements. WC is more of a trading capital which is not retained within the business for a period extending to more than a year. The money invested in working capital changes its form frequent as to be able to generate cash readily on available current asset.

2.2 EMPIRICAL REVIEW

Eljelly (2004) studied the relation between working capital management and profitability for 27 companies in KSA, from 3 non-financial sectors within the date ranges from 1996-2000. The measure of liquidity with respect to the independent variables were the current ratio (CR) and the cash conversion cycle (CCC). A controlled variable in the research was taken as the size of the firm. Net operating income was taken as the dependent variable with 2 exceptions as firstly, the NOI is before depreciation and secondly, it'd be deflated by sales. The result identified that the WCM has a negative relation with profitability.

Falope and Ajilore (2009) conducted research for WCM efficiency with a sample of 50 Nigerian listed non-financial companies. The research results highlighted a significantly negative relationship between net operating profitability and the ACP, ITO, APP and CCC. Another aspect of this research was that no significant effect on the size of the firm was recorded means all large- and small-scale firms followed up to the same study outcomes.

Mathuva (2010) carried out results for 30 firms listed in the Nairobi Stock Exchange and studied their profitability change with influence of working capital management from 1993 to 2008. The study carried out results in multiple hypothesis testing, initially study indicated no significant relation between profitability and account collection period. Secondly, there was an identified positive significant relation between inventory turnover and profitability. Lastly, the hypothesis proved a significant positive relation between average payment period and profitability.

Afeef (2011) determines the effect of working capital management on firm's profitability. The sample was collected from 40 SMEs listed in the Pakistan Stock Exchange for a period of 2003 to 2008. The results highlighted perceptible impact on profitability of the components of WC taken in account.

Gakure et al. (2012) studied the relation between manufacturing firm's performance with WCM. The 18 listed companies from NSE were taken to run a regression model to prove the hypothesis of relation between performance and liquidity. The study showed significant negative relation between manufacturing firm's performance and liquidity.

Wasiuzzaman and Arumugam (2013) studied the working capital components of 192 Malaysian countries from year 2000-2007. The results shed light on the efficiency of working capital. The working capital efficiency was tested against profitability with measures of return on asset, EBIT and return on equity.

Mandipa, G. and Sibindi, A.B. (2022) examined the relation between WCM strategies and financial performance in retail firms in South Africa. The hypothesis concluded on a positive result which highlighted a positive significant relation between firm's performance and WCM strategies.

2.3 SUMMARY OF LITERATURE REVIEW

The empirical review highlights the significant relation between working capital management efficiency with firm's financial performance. There has been contradiction between researchers in carrying out impact of WCM efficiency on profitability and financial performance as the results at some instances were positive and at other instance were negative in relation. Some researchers carried out results based on different components of WC while some considered results based on ROA, ROE and EBIT. Therefore, this study attempted to counter the gap between drawing a relational bridge WCM and financial performance. The study is highly concentrated towards the overall impact on non-financial sector of Pakistan.

3. RESEARCH DESIGN AND METHODS

3.1 CONCEPTUAL FRAMEWORK

3.1.1 INDEPENDENT VARIABLES

Average Collection Period**:** This variable shows the time it takes to receive the due payments from the Debtors and has a huge positive connection with two of the most important ratios I.e. GP margin and ROA (return on assets). If the receivables are managed effectively, it imposes an optimistic effect on the financial performance of the firm. Moreover, it can be forecasted, for sure, that an increase in the Debtor turnover will directly dissimulate the receivables turnover leading to a negative impact on the profits of the firm. According to findings, the Debtors turnover is directly proportionate to the ROE (return on equity) but this correlation can be considered a trivial one.

In order to improve the Working Capital Management, an increase in Average collection period should be avoided so that the total assets of the company are well maintained.

Payment Period: This variable indicates the time it takes to make payments to the Creditors or suppliers of the company. Creditor's period is directly linked to the GP margin and inversely linked to the ROA yet the correlation is of no importance. Nevertheless, Creditors period directly relates to the ROE. One aspect of making delayed payments to the Creditors is that the same money can be utilized to make investments in the firms and hence, improving the net worth of the company.

In relation to the working capital management, the Creditors turnover, if high should be used fully to finance the working capital requirements of the company, which means that the credit term allowed by the supplier should be used efficiently.

Inventory turnover: This variable indicates that how quickly the inventory is turned to finished goods and sold. The ratio shows efficient results if the stock doesn't accumulate for a longer period of time. If this variable tends to be high for firms, signifies that the sales are high and vice versa for a low rate of Inventory turnover. The variable indicates direct relationship between the Inventory turnover and ROA as the cash generated from sale of finished goods increases, the working capital improves as well.

The relation between working capital and Inventory is very highlighted. This further explains that although a huge level of inventory does indicate a positive impact on the working capital management yet it doesn't indicate a good liquidity condition when it comes to making payments for current liabilities.

As far as the Controlling variables are considered;

Firm size: Firm size and ROA are positively correlated to each other. It is because higher proportion of total assets along with the sales indicate a bigger size of the firm.

These variable states that the working capital management and the firm size are directly related. This means that a well-organized working capital will lead to a better profitability of the firm and hence, increasing the size of the firm. The second aspect of this variable is that a bigger firm's size is an indication of a high-level profitability for the Firm. Moreover, if the scenario suggests that

the firm is willing to increase its operations, it will require an increasing working capital as well in order to combat with the growth aspect. The buying and selling are the two main areas that depict the dependency on the working capital needs. A firm, that relies on making purchases of goods on credit terms and selling the final goods on cash, it is an indication of not much requirement of working capital.

Liquidity: A firm's liquidity and its ROA have a direct relationship with each other. This aspect indicates that the more assets a company entails, it should ensure a higher ROA to compensate with the investments shareholders make by generating higher profits. A ratio termed as quick ratio is used to evaluate a firm's liquidity position. A higher liquidity ratio means that the company comprises of enough liquid assets to pay back its current liabilities.

The aspect of liquidity is basically used to analyze whether the company is capable enough to pay its due expenses when required or in another scenario, how successful the company is to arrange cash by selling off its most liquid assets in order to make debt payments. Therefore, Working Capital Management portrays the aspect in which payment of debt is made by the company's most liquid assets. If the firm is successful enough to maintain its Working Capital, it can assure an acceptable liquidity position throughout the life of the company.

Leverage: This variable indicates the usage of debt in order to make relevant financing for the assets of the company. The only difference that separates ROA with ROE is this particular variable only i.e Leverage. As the accounting equation is Assets is equal to Liabilities plus shareholders equity. It indicates that in the case of absence of debt from a Firm, the total assets would've been equal to the shareholder's equity. Therefore, ROA and ROE would've been equal as well. Whereas if the firm has leverage, the ROE would exceed the ROA. As the company has debt, the assets increase due to the incoming cash. As far as the ROE is concerned, an increase in the Operating Leverage gives rise to the ROE as the sales increase; similarly, it speeds up the fall in ROE as the level of sales fall.

The variable i.e., Leverage has a major influence on the working capital management. It is because the companies having huge dependency on debt or are highly leveraged, have to bear increased cost of debts which are short term in nature. These kinds of companies make debt payments using internal means and finance their working capital via outside or external sources. Such firms face difficulty while getting additional loans because of the possible element of getting bankrupt. Less people tend to invest in highly leveraged companies therefore they earn less as compared to less Leveraged companies.

3.1.2 DEPENDENT VARIABLES

ROA: Return on assets signifies the profitability of a firm in comparison to the Total Assets it owns. This means that ROA indicates the effectiveness of the assets to lead to making profits. A higher ROA indicates that the assets a company entails, are successful in being able to contribute to the firm's profits whereas a low ROA indicates the ineffectiveness of the assets to generate a profit.

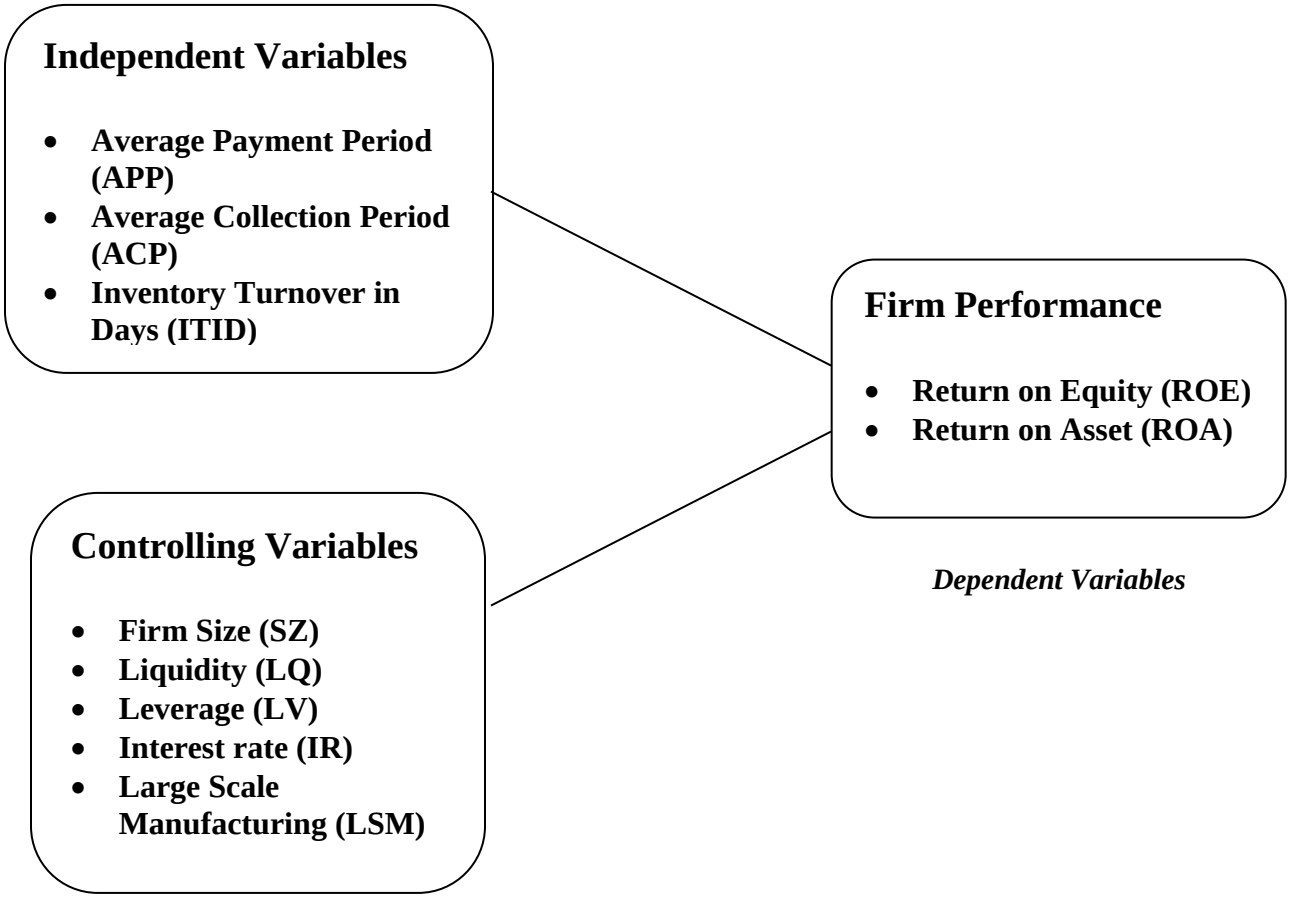
The relationship between ROA and Working capital Management is not rational since improvement in the ratio would mean an increase in profits whereas the working capital management equation comprises of the effective management of assets and liabilities.

ROE: Return on Equity estimates the return on investment which is the payback for the owners of the company, who invested in a company's common stock. This ratio basically signifies the returns generated for their holdings in shares. ROE indicates the efficiency of a company in making profits from the amount, shareholders invested initially in the company.

The relationship between ROE and the working capital in not trivial, just like ROA. It is because the ratio doesn't impose any effect on the working capital management's elements I.e., Assets or Liabilities.

3.2 THEORETICAL FRAMEWORK

In order to achieve the objective of the study a combination of the following variables would be taken into account. The Independent Variables comprised of Average Payment Period (APP), Average Collection Period (ACP), and Inventory Turnover (ITO) while the Dependent Variables include the Return on Asset (ROA) and the Return on Equity (ROE) as an indicator for the Firm's performance. In order to counter any deviation and error in the results following controlling variables would be taken into account which are the Firm Size, Liquidity and Leverage.



3.3 HYPOTHESIS

In view of the relationship between the Independent and Dependent variables as mentioned above, the different variables have been used in this study amongst which the extracted and summarized are presented in the following hypothesis:

H_{10} = There is no significant affect of Average Collection period (ACP) on Firm Performance

H_{11} = There is significant affect of Average Collection period (ACP) on Firm Performance

H_{20} = There is no significant influence of Average Payment period (APP) on Firm Performance

H_{22} = There is significant influence of Average Payment period (APP) on Firm Performance

H_{30} = There is no significant impact of Inventory Turnover (ITID) on Firm Performance

H_{33} = There is significant impact of Inventory Turnover (ITID) on Firm Performance

H_{40} = There is no significant impact of Leverage (LV) on Firm Performance

H_{44} = There is significant impact of Leverage (LV) on Firm Performance

H_{50} = There is no significant impact of Liquidity (LQ) on Firm Performance

H_{55} = There is significant impact of Liquidity (LQ) on Firm Performance

H_{60} = There is no significant impact of Size (SZ) on Firm Performance

H_{66} = There is significant impact of Size (SZ) on Firm Performance

H_{70} = There is no significant impact of Interest Rate (IR) on Firm Performance

H_{77} = There is significant impact of Interest Rate (IR) on Firm Performance

H_{80} = There is no significant impact of Large-Scale Manufacturing (LSM) on Firm Performance

H_{88} = There is significant impact of Large-Scale Manufacturing (LSM) on Firm Performance

3.4 MODEL

The type of study which is being conducted, assists us to examine the relationship between the different variables as discussed above. Thus, we are using the Multiple Regression Model as shown below.

3.4.1 MODEL SPECIFICATION

Model I: $ROA = \beta0 + \beta1\ ITID + \beta2\ ACP + \beta3\ APP + \beta4\ LQ + \beta5\ SZ + \beta6\ LV + \beta7\ IR + \beta8\ LSM + \varepsilon$

Model II: $ROE = \beta0 + \beta1\ ITID + \beta2\ ACP + \beta3\ APP + \beta4\ LQ + \beta5\ SZ + \beta6\ LV + \beta7\ IR + \beta8\ LSM + \varepsilon$

3.5 POPULATION AND STUDY

In order to conduct the findings of the study, the companies that have been chosen are extracted from several non-financial sectors of Pakistan. These sectors include: Chemical, Textile, Cement, Automobiles, Steel, and Sugar sector. The research which has been conducted is employed solely through Secondary Data. PANEL DATA is being used for the collection of data for this study which is done on quarterly basis. The time span in order to conduct the findings for the study, is 8 years from 2014 to 2021.

3.6 SAMPLE SIZE AND COLLECTION OF SAMPLES

In view of the findings of the study, the sample size that has been selected is of 30 non-financial companies that are listed on the KSE-100 index as can be viewed on the official website of Pakistan Stock Exchange. The sample size which was selected initially, consists of many different non-financial sectors out of which 6 sectors have been selected. The sample opted for, includes 05 out of 11 companies in the Automobile Assembler sector, 05 out of 54 companies from the Textile Composite sector, 05 out of 29 Companies from the Sugar sector, 05 out of 22 Companies in the Cement sector, 05 out of 28 Companies in the Chemical sector and 05 out of 20 Companies in the Steel sector. The companies that are selected for the sample size are based on the complete availability of Secondary Data.

3.7 SOURCES OF DATA

In conducting the research, Secondary Data is used. The collection of data is completed through the authentic sources which consists of the quarterly Financial Statements of the company, official website of Pakistan Stock Exchange (PSX) as well as the company announcements on official website.

3.8 DATA COLLECTION

The data collected is from the administrations publications as well as obtained from previous studies and historical records. While analyzing the previous conversed, we are classifying the gaps to study.

3.9 DATA ANALYSIS METHODS

The data that will be collected will be completely based on the Secondary Sources, such as from authentic sites consisting of PSX as well as the financials of the sample companies that are chosen. As discussed earlier, the period of span for the Sample study is 8 years commencing from 2014 to 2021. The tests that are mostly estimated are based on zero level which confirms that it would be best to use Regression Analysis for the study. The ratios that will be used consists of the Measure of Central Tendency (Median, Mean and Mode) as well as the Measure of Dispersion (Standard Deviation and Variance). The data analysis method that will be implemented would be the Multiple Regression Model performed by using STATA to determine the connection/ relationship between the Independent Variables and Dependent Variables.

4. RESULTS AND FINDINGS

The results carried out identify the combined effect of average collection period, average payment period, inventory turnover in days, size, leverage, liquidity, interest rate and large scale manufacturing on return on equity and return on asset of the firms in automobile, cement, chemical, steel, sugar and textile sector of Pakistan.

4.1 DESCRIPTIVE ANALYSIS

The Descriptive statistical analysis outlines the different characteristics including mean, standard deviation, skewness and kurtosis of selected dataset dependent and independent variables which provide a comparison between the overall research period, pre covid period and post covid period.

TABLE 1: Descriptive analysis of 30 non-financial sector firms of Pakistan indicating variations during complete research period, pre-covid period and post-covid period

Var	Obs			Mean			Std. Deviation			Skewness			Kurtosis		
	TP	PRC	PSC	TP	PRC	PSC	TP	PRC	PSC	TP	PRC	PSC	TP	PRC	PSC
ROE	960	720	240	0.2396	0.2541	0.1965	0.0466	0.0461	0.0481	2.9743	2.8002	3.5015	18.9628	18.8013	19.9805
ROA	960	720	240	0.0928	0.1583	0.1962	0.0861	0.05451	0.175	27.0744	2.6079	13.9305	790.3356	21.4221	205.5321
ACP	960	720	240	32.4958	28.5226	44.4154	118.4915	60.3406	212.5877	22.2074	9.6545	14.6339	588.2576	150.0311	222.3349
APP	960	720	240	57.2547	56.3445	59.9854	122.7088	116.5993	139.6741	5.7139	5.7551	5.4671	41.6631	43.2236	36.4078
ITID	960	720	240	73.5924	65.1637	98.8783	113.4799	87.7111	166.3496	3.8089	2.4402	3.4492	24.9068	11.1474	17.0768
SZ	960	720	240	2.17E+07	1.89E+07	3.01E+07	2.68E+07	2.25E+07	3.57E+07	3.0275	3.1256	2.3807	15.5246	19.3083	8.9123
LV	960	720	240	3.4612	3.1754	4.3188	20.0656	10.1834	36.0918	22.1936	7.7705	14.7356	592.1886	68.07213	225.0388
LQ	960	720	240	1.0314	1.0696	0.9171	0.9462	1.0507	0.5041	4.1218	3.9193	0.3671	29.0821	24.8989	2.7517
IR	960	720	240	0.0817	0.0819	0.0812	0.0232	0.0252	0.0157	0.9452	0.8762	1.1553	2.7667	2.5054	2.5125
LSM	960	720	240	0.0127	0.0158	0.0033	0.1398	0.1486	0.1091	-0.4781	-0.6299	0.5288	2.2645	2.2181	2.2337

Table 1 portrays the descriptive statistical analysis of thirty non-financial sector firms registered under KSE. The data has been collected for period beginning 2014 until 2021 on quarterly basis. There is total 960 observations in which 720 and 240 observations shows two different periods namely the pre covid period and the post covid period respectively. During the total period mean of ROE has been marked at 23.96% within the data range period with a standard deviation of 4.66% which means that the profitability of the firms revolved 4.66% on both ends while the mean of ROA has been at 9.28% with a standard deviation on 8.61% on both ends. As per the data for pre covid era the mean of ROE has been countered at 25.41% with a standard deviation of 4.61% while the mean of ROA has been at 15.83% with a standard deviation of 5.45%. As per the post covid period the mean of ROE has been measured at 19.65% with a standard deviation of 4.81% while the ROA recorded at 19.62% with a standard deviation of 17.5%.

Within the complete research period the mean average collection period was 32.5 days while the SD is 118.5 days which is too high but in contrast to pre covid period if we consider average collection period on pre covid period the mean value is 28.5 days however the SD is 60.3 days but, in the post, covid period the average collection period is 44.4 days while the SD is 212.6 days which highlights to the fact that after covid the overall collection cycle was highly disrupted. The average mean value

for TP, PRC and PSC were 57.3 days, 56.3 days and 60 days respectively however the standard deviation was most in the post covid period that is 139.7 days because the collection cycle was when elongated due to credit terms extension the companies were also reluctant to pay early as the optimum level of working capital has to be sustained within the company. Inventory turnover in days on mean was 73.5 days with SD of 113.5 days during the total research period however during pre-covid time the mean was 65 days with SD of 87.7 days and post covid the mean inventory turnover was highest at 98.9 days with SD of 155.3 days.

4.2 REGRESSION ANALYSIS

TABLE 2: Random effect model for return on equity for complete research period

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.0000203	.0000102	1.99	0.046	3.31e-07	.0000403
app	-.0000258	.0000161	-1.60	0.109	-.0000574	5.72e-06
itid	-.0000412	.0000158	-2.60	0.009	-.0000722	-.0000101
sz	-2.30e-10	7.94e-11	-2.89	0.004	-3.85e-10	-7.39e-11
lv	.0001765	.0000573	3.08	0.002	.0000642	.0002888
lq	-.0016695	.0015828	-1.05	0.292	-.0047718	.0014328
ir	-.2748203	.0453957	-6.05	0.000	-.3637942	-.1858464
lsm	-.000695	.0074879	-0.09	0.926	-.015371	.013981
_cons	.0563925	.0078173	7.21	0.000	.0410709	.0717141
sigma_u	.03445254					
sigma_e	.03234316					
rho	.53154812	(fraction of variance due to u_i)				

Table 2 shows ACP, ITID, SZ, LV and IR are significant with Return on Equity (ROE) at 5% significance level and with 95% confidence, However APP, LQ and LSM were insignificant with ROE. The ACP has positive impact on FP signifying that the facility of credit swells the sale volume which, in turn raise the monetary performance of firms. (Bagh1, 2016). The negative impact of ITID on ROE signifies that when the other factors constant if the ITID Increases by 1 unit, the average value of the ROE will decrease. This shows that the shorter the time to storage inventories, the higher the profitability of a business. (Nguyen, Pham, & Nguyen, 2020). The size of firm has negative relation with ROE as it is indicated that more cost is added in the companies which is turning out to be inefficient our firm size hypothesis results are in line with the study by Masnoon and Saeed (2014). They also reported a negative relationship between firm financial performance and size. Leverage has a significantly positive impact on ROE based on these considerations it can be stated that, as leverage gets higher it becomes more costly to finance the working capital. That is, as leverage decreases, profitability is less likely to diminish because firms become less exposed to negative impacts of having a longer CCC. (Ilhan Dalci, 2018). Interest rate has a negative significant impact on the ROE which is because increase in IR increases the overall finance cost of the firm besides, maintaining high working capital will lead to external capital expense, the firm needs to bear more interest rate (Kieschnick et al., 2013) and higher credit risks. Moreover, keeping high level of working capital means that the firm may lose many other projects for lack of money. (Hungb, 2020)

TABLE 3: Random effect model for return on equity for pre-covid period

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.000085	.000029	2.93	0.003	.0000282	.0001419
app	-.0000429	.0000198	-2.17	0.030	-.0000817	-4.14e-06
itid	-.0000612	.0000237	-2.58	0.010	-.0001077	-.0000147
sz	-3.01e-10	1.03e-10	-2.91	0.004	-5.04e-10	-9.81e-11
lv	.0001327	.0001635	0.81	0.417	-.0001877	.0004531
lq	-.0036167	.0015758	-2.30	0.022	-.0067053	-.0005282
ir	-.2818387	.0432694	-6.51	0.000	-.3666451	-.1970322
lsm	-.0011164	.0071825	-0.16	0.876	-.015194	.0129611
_cons	. 0616396	.0080811	7.63	0.000	.045801	.0774783

sigma_u	.0363685
sigma_e	.02849342
rho	.61964926 (fraction of variance due to u_i)

Table 3 shows before Covid, ACP, APP, ITID, SZ, LQ and IR had significant impact on ROE. The ACP has positive impact on FP signifying that the facility of credit swells the sale volume which, in turn raise the monetary performance of firms. (Bagh1, 2016). The average payment period had negative impact on the ROE which is because when payments are delayed to buy the goods, the sales are delayed and yet results in decline in profitability this outcome is inline with the results of (Bagh, 2016) which depicts that the APP have negative but statistically significant impact on ROE. ITID has negative but significant impact on ROE as the longer holding period of inventory adds more holding cost and reduces sales as well. The size of firm has negative relation with ROE as it is indicated that more cost is added in the companies which is turning out to be inefficient our firm size hypothesis results are in line with the study by Masnoon and Saeed (2014). They also reported a negative relationship between firm financial performance and size. The liquidity has a negative impact on profitability as the liquidity increases the risk of insolvency is reduced but along with that the profitability is also reduced, the results are in line with the research of Raheman and Nasr (2007). Interest rate has a negative significant impact on the ROE which is because increase in IR increases the overall finance cost of the firm besides, maintaining high working capital will lead to external capital expense, the firm needs to bear more interest rate (Kieschnick et al., 2013)

TABLE 4: Random effect model for return on equity for post-covid period

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	7.91e-06	.0000138	0.57	0.567	-.0000192	.000035
app	-.000017	.0000371	-0.46	0.648	-.0000897	.0000558
itid	-.0000314	.0000312	-1.01	0.313	-.0000926	.0000297
sz	3.47e-11	1.41e-10	0.25	0.805	-2.41e-10	3.11e-10
lv	.0001852	.0000809	2.29	0.022	.0000267	.0003437
lq	.0011731	.0091449	0.13	0.898	-.0167506	.0190968
ir	-.2254032	.1829324	-1.23	0.218	-.583944	.1331376
lsm	-.0026399	.0264016	-0.10	0.920	-.0543862	.0491063
_cons	.0388286	.0191445	2.03	0.043	.001306	.0763512
sigma_u	.02500772					
sigma_e	.04061043					
rho	.27494413	(fraction of variance due to u_i)				

Table 4 shows the post covid effect on ROE, in which only LV was significant and positively related to ROE that is because Post covid; the companies faced larger losses and were not able to cover the expenses that's why the dependency on debt financing was increased and equity financing falls as companies do not have enough retained earnings to cover their finances. That's why long-term debt financing was increased and due to long term debts, the cost of financing was diminished resulting in overall increase in profitability.

TABLE 5: Breusch and Pagan Lagrangian multiplier test for ROE

roe[id,t] = Xb + u[id] + e[id,t]
Estimated results:

	Var	sd = sqrt(Var)
roe	.0021726	.0466116
e	.0010461	.0323432
u	.001187	.0344525

Test: Var(u) = 0
chibar2(01) = 3243.82
Prob > chibar2 = 0.0000

Table 5 shows the Breusch and Pagan Lagrangian multiplier test for random effects which is carried out because the Hausman Test between the fixed effect and Random effect had Prob > chibar2 greater than 0.05. The results for Breusch LM led to strong rejection of the null hypothesis for any confidence level. So, a phenomenon of heteroskedasticity is present.

TABLE 6: Random effect model for return on asset for complete research period

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0006877	.0001365	-5.04	0.000	-.0009553	-.0004201
app	-.0000403	.0001871	-0.22	0.830	-.000407	.0003264
itid	.0010022	.0001973	5.08	0.000	.0006155	.001389
sz	-8.13e-11	7.27e-10	-0.11	0.911	-1.51e-09	1.34e-09
lv	.038058	.0007612	50.00	0.000	.0365661	.0395498
lq	.0560151	.0187225	2.99	0.003	.0193195	.0927106
ir	-.2130507	.6189969	-0.34	0.731	-1.426262	1.000161
lsm	.0131085	.1024546	0.13	0.898	-.1876987	.2139158
_cons	-.1267605	.0624642	-2.03	0.042	-.2491881	-.004333
sigma_u	.08778207					
sigma_e	.41731752					
rho	.04237165	(fraction of variance due to u_i)				

Table 6 shows negative relation between average collection period and ROA The key points in this study are firstly there exists a negative relationship between the profitability and the average collection period, the lower the average collection period higher will be the profitability, indicating that a decrease in the number of days a firm receives payment from sales affects the profitability of the firm positively. (Syeda, 2021). ITID has a positive relation with ROA according to the theory of (Weil et al, 2014), increasing inventory turnover will increase ROA, meaning that if inventory turnover rises, then ROA will also rise and vice versa. The LV has positive relation with ROA Founder of signaling theory, Ross (1977) concluded that signals are necessary to raise fund for a company, the high quality firms will use more debt and have higher leverage as a signal of bright prospects and so positive relationship exists between leverage and profitability. There are findings concluding that a positive relationship exists between leverage and profitability (Avci, 2016; Abor, 2005). This positive relationship implies that firms with more debt generally are more profitable. LQ and ROA has positive correlation An indication of this relationship is that firms operating in a risky competitive market are more likely to adapt to adverse changes in the environment and maintain high profitability if they hold liquid assets (Goddard et al., 2005, p. 1280).

TABLE 7: Random effect model for return on asset for pre-covid period

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.0001793	.0001039	1.73	0.084	-.0000244	.000383
app	-.0000852	.0000709	-1.20	0.229	-.0002241	.0000537
itid	-.0002654	.000085	-3.12	0.002	-.0004319	-.0000989
sz	1.17e-10	3.68e-10	0.32	0.752	-6.06e-10	8.39e-10
lv	.0029909	.000585	5.11	0.000	.0018443	.0041375
lq	-.0107524	.0056414	-1.91	0.057	-.0218094	.0003045
ir	-.69342	.1552362	-4.47	0.000	-.9976775	-.3891626
lsm	.0116921	.0257752	0.45	0.650	-.0388264	.0622106
_cons	.1317881	.027661	4.76	0.000	.0775735	.1860027
sigma_u	.12188451					
sigma_e	.10251639					
rho	.58567211	(fraction of variance due to u_i)				

Table 7 shows pre covid situation of the industry it shows negative correlation between ITID and ROA There is also evidence from Alipour (2011) found a negative significant effect of inventory turnover on profitability because the increase in ITID will cost more for holding the inventory and yet would take longer time to sell it, that will eventually result in reducing profits. The results also shows a positive relation between LV and ROA Margaritis and Psillaki (2010) study also finds the significant positive relationship between firm performance and leverage using high and low growth French firm. This positive relationship implies that firms with more debt generally are more profitable. IR and ROA has negative significant relationship. Increase in IR increases the overall finance cost of the firm besides, maintaining high working capital will lead to external capital expense, the firm needs to bear more interest rate (Kieschnick et al., 2013)

TABLE 8: Random effect model for return on asset for post-covid period

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0008763	.000198	-4.42	0.000	-.0012644	-.0004881
app	.0005372	.0004435	1.21	0.226	-.000332	.0014065
itid	.0009562	.0004081	2.34	0.019	.0001563	.0017561
sz	-1.14e-10	1.11e-09	-0.10	0.918	-2.29e-09	2.06e-09
lv	.043804	.001173	37.34	0.000	.041505	.046103
lq	.076797	.0940733	0.82	0.414	-.1075834	.2611773
ir	-2.009177	2.673753	-0.75	0.452	-7.249636	3.231282
lsm	-.3570453	.3855469	-0.93	0.354	-1.112703	.3986127
_cons	.0165693	.2485266	0.07	0.947	-.4705338	.5036725
sigma_u	0					
sigma_e	.61213112					
rho	0	(fraction of variance due to u_i)				

Table 8 shows post covid effect on ROA, in which ACP is negatively corelated with ROA that is because the overall cash collection was delayed and an increase in receivables disturbed the entire cash conversion cycle. LV was significant and positively related to ROA that is because Post covid; the companies faced larger losses and were not able to cover the expenses that's why the dependency on debt financing was increased and equity financing falls as companies do not have enough retained earnings to cover their finances. That's why long-term debt financing was increased and due to long term debts, the cost of financing was diminished resulting in overall increase in profitability.

TABLE 9: Breusch and Pagan Lagrangian multiplier test for ROA

roa[id,t] = Xb + u[id] + e[id,t]

Estimated results:

	Var	sd = sqrt(Var)
roa	.785177	.8861022
e	.1741539	.4173175
u	.0077057	.0877821

Test: Var(u) = 0
chibar2(01) = 650.92
Prob > chibar2 = 0.0000

Table 9 shows the Breusch and Pagan Lagrangian multiplier test for random effects which is carried out because the Hausman Test between the fixed effect and Random effect had Prob > chibar greater than 0.05. The results for Breusch LM leads to strong rejection of the null hypothesis for any confidence level. So, a phenomenon of heteroskedascitcity is present.

TABLE 10: Random effect model for return on equity for complete research period in automobile sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0016069	.000271	-5.93	0.000	-.002138	-.0010757
app	-.0000334	.0000623	-0.54	0.592	-.0001556	.0000888
itid	-.0001929	.0000961	-2.01	0.045	-.0003812	-4.52e-06
lv	-.0042528	.0023043	-1.85	0.065	-.0087692	.0002636
lq	.0008389	.0016742	0.50	0.616	-.0024424	.0041202
sz	-1.60e-10	7.42e-11	-2.15	0.032	-3.05e-10	-1.40e-11
ir	-.4113915	.1034066	-3.98	0.000	-.6140647	-.2087183
lsm	.0157714	.0165881	0.95	0.342	-.0167406	.0482834
_cons	.0975557	.0103725	9.41	0.000	.077226	.1178855
sigma_u	0					
sigma_e	.02037697					
rho	0	(fraction of variance due to u_i)				

Table 10 shows a negative significant relation of average collection period with return on equity with in automobile sector as most dealings of automobile are in export extended credit terms in terms of receivables extends the average cash receivable cycle which decreases profitability similar results were carried out by (Dharma, 2021), The results also identify that with increase in inventory turnover and interest rates profitability was reduced this is because longer inventory turnover costed more in terms of holding and distribution while high interest rates increased the cost of financing resulting lower return on equity aligned with the results of (Tailab, 2014), (Katsampoxakis et al. 2015), (Moss and Stine, 1993).

TABLE 11: Random effect model for return on equity for pre covid period in automobile sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0012895	.0003137	-4.11	0.000	-.0019043	-.0006747
app	-.0000851	.0000747	-1.14	0.255	-.0002315	.0000613
itid	-.0000918	.0001371	-0.67	0.503	-.0003604	.0001769
sz	-7.35e-11	1.29e-10	-0.57	0.568	-3.26e-10	1.79e-10
lv	-.0036192	.0025841	-1.40	0.161	-.0086839	.0014455
lq	.0003398	.0017339	0.20	0.845	-.0030586	.0037383
ir	-.4787915	.112168	-4.27	0.000	-.6986367	-.2589463
lsm	.0169264	.0181092	0.93	0.350	-.0185669	.0524197
_cons	.1007477	.0118252	8.52	0.000	.0775707	.1239247
sigma_u	0					
sigma_e	.0189241					
rho	0	(fraction of variance due to u_i)				

Table 11 indicate that average collection period and interest rates were negatively corelated with return on equity as longer conversion cycle and extended financing cost reduced profitability in totality of the business. (Samiloglu and Demirgunes, 2008) carried out similar results for the automobile industry.

TABLE 12: Random effect model for return on equity for post covid period in automobile sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0033507	.0005798	-5.78	0.000	-.0044871	-.0022143
app	.0000597	.000114	0.52	0.601	-.0001639	.0002832
itid	-.0000969	.0001814	-0.53	0.593	-.0004523	.0002586
sz	-1.87e-10	8.36e-11	-2.23	0.025	-3.51e-10	-2.29e-11
lv	.0101892	.0094887	1.07	0.283	-.0084083	.0287868
lq	.0167309	.0192643	0.87	0.385	-.0210264	.0544882
ir	-.0648922	.2681814	-0.24	0.809	-.5905182	.4607338
lsm	.0300583	.0391786	0.77	0.443	-.0467303	.1068469
_cons	.026616	.0403538	0.66	0.510	-.0524761	.105708
sigma_u	0					
sigma_e	.01094596					
rho	0	(fraction of variance due to u_i)				

Table 12 shows a negative correlation of size with the return on equity this is because the increase in size was not converting in to profits as investments post covid were not generating much results which resulted in decreased profitability.

TABLE 13: Random effect model for return on asset for complete research period in automobile sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.003997	.0007444	-5.37	0.000	-.0054561	-.0025379
app	-.0001066	.0001712	-0.62	0.533	-.0004422	.000229
itid	-.0004084	.000264	-1.55	0.122	-.0009259	.000109
lv	.0079676	.00633	1.26	0.208	-.0044389	.0203741
lq	-.0042911	.0045989	-0.93	0.351	-.0133049	.0047226
sz	-3.66e-10	2.04e-10	-1.80	0.073	-7.66e-10	3.35e-11
ir	-.9839142	.2840578	-3.46	0.001	-1.540657	-.4271711
lsm	.0303294	.0455674	0.67	0.506	-.058981	.1196398
_cons	.2147225	.0284933	7.54	0.000	.1588767	.2705683
sigma_u	0					
sigma_e	.06479498					
rho	0	(fraction of variance due to u_i)				

Table 13 has similar results as only average collection period and interest rates are significant and have negative correlation with ROA that is again because of the same reason as extended collection period delays the overall all process of cash conversion cycle however increase in interest rate increases the finance cost, both end up decreasing the profitability.

TABLE 14: Random effect model for return on asset for pre covid period in automobile sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.002898	.0008668	-3.34	0.001	-.004597	-.001199
app	-.0002583	.0002065	-1.25	0.211	-.0006629	.0001464
itid	-.0001161	.0003788	-0.31	0.759	-.0008585	.0006262
sz	-1.27e-10	3.56e-10	-0.36	0.720	-8.24e-10	5.70e-10
lv	.0107115	.0071408	1.50	0.134	-.0032843	.0247073
lq	-.0051354	.0047916	-1.07	0.284	-.0145267	.0042559
ir	-1.171142	.3099649	-3.78	0.000	-1.778662	-.563622
lsm	.0325963	.0500428	0.65	0.515	-.0654858	.1306785
_cons	.2172344	.0326778	6.65	0.000	.1531872	.2812817
sigma_u	0					
sigma_e	.0645588					
rho	0	(fraction of variance due to u_i)				

Table 14 shows the negative correlation of average collection period and interest rate with return on asset which is again due to above mentioned reasons in table 13. Particularly in terms of automobile sector these 2 areas are to be most looked upon.

TABLE 15: Random effect model for return on asset for post covid period in automobile sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0100337	.0014567	-6.89	0.000	-.0128888	-.0071785
app	.0001192	.0002865	0.42	0.677	-.0004424	.0006808
itid	-7.10e-06	.0004557	-0.02	0.988	-.0009002	.000886
sz	-5.12e-10	2.10e-10	-2.44	0.015	-9.24e-10	-1.00e-10
lv	.053633	.0238401	2.25	0.024	.0069073	.1003588
lq	.0644857	.0484009	1.33	0.183	-.0303784	.1593498
ir	-.1095492	.6737976	-0.16	0.871	-1.430168	1.21107
lsm	.0773132	.0984349	0.79	0.432	-.1156157	.2702421
_cons	.00161	.1013877	0.02	0.987	-.1971063	.2003264
sigma_u	0					
sigma_e	.03748586					
rho	0	(fraction of variance due to u_i)				

Table 15 shows after covid size also negatively affected return on assets that because the investments were not generating the estimated cashflows while leverage positively affected ROA that is because of better credit terms or long-term financing firms.

TABLE 16: Random effect model for return on equity for total research period in cement sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	00027	.0002867	-0.94	0.346	-.0008319	.0002918
app	.000068	.0001591	0.43	0.669	-.0002438	.0003798
itid	-.0001941	.0001922	-1.01	0.312	-.0005708	.0001825
lv	-.0091727	.0056607	-1.62	0.105	-.0202676	.0019221
lq	.0047676	.0027178	1.75	0.079	-.0005592	.0100943
sz	-1.05e-10	5.57e-11	-1.88	0.060	-2.14e-10	4.47e-12
ir	-.0290735	.097248	-0.30	0.765	-.2196762	.1615291
lsm	-.0276749	.015846	-1.75	0.081	-.0587324	.0033825
_cons	.0395903	.011519	3.44	0.001	.0170135	.0621672

sigma_u	0
sigma_e	.02418735
rho	0 (fraction of variance due to u_i)

Table 16 shows that the overall cash conversion cycle is causing near to no effect of the profitability of cement sector, the slight effect of size on the return on equity sows that the investment in increasing the asset is not bringing in more cashflows while the net effect on profitability is near to zero.

TABLE 17: Random effect model for return on equity for pre covid period in cement sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.0002834	.0003285	0.86	0.388	-.0003605	.0009272
app	.0000227	.0001632	0.14	0.889	-.0002971	.0003425
itid	-.0002663	.0002174	-1.22	0.221	-.0006924	.0001598
sz	-1.41e-10	6.91e-11	-2.03	0.042	-2.76e-10	-5.08e-12
lv	-.01263	.0060566	-2.09	0.037	-.0245007	-.0007594
lq	.0029367	.0027896	1.05	0.292	-.0025308	.0084043
ir	-.0560542	.0987304	-0.57	0.570	-.2495622	.1374538
lsm	-.0248601	.0161322	-1.54	0.123	-.0564786	.0067585
_cons	.0519924	.0117341	4.43	0.000	.0289939	.0749909

sigma_u	0
sigma_e	.02123752
rho	0 (fraction of variance due to u_i)

Table 17 shows significant negative relationship of ROE with size and leverage Hajihassani (2015) studied the relationship of cement sector on profitability, his findings indicate that size of firm has a significant negative effect on profitability. Batchimeg (2017); Muthusamy et al. (2019); Farah et al. (2016); Ahsan and Shahzadi (2017); Muhammad et al. (2017); Nawaz et al. (2015) found a significant negative association between leverage and performance in cement industry.

TABLE 18: Random effect model for return on equity for post covid period in cement sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0006503	.0005463	-1.19	0.234	-.001721	.0004204
app	.0003199	.0004416	0.72	0.469	-.0005455	.0011853
vitid	-.0002297	.0003556	-0.65	0.518	-.0009266	.0004672
sz	1.01e-10	1.08e-10	0.93	0.352	-1.12e-10	3.13e-10
lv	.0018197	.0137321	0.13	0.895	-.0250947	.0287341
lq	.018532	.0146572	1.26	0.206	-.0101955	.0472595
ir	.1652579	.2841946	0.58	0.561	-.3917534	.7222691
lsm	-.0589971	.0416285	-1.42	0.156	-.1405875	.0225934
_cons	-.0283244	.0423603	-0.67	0.504	-.1113491	.0547003
sigma_u	0					
sigma_e	.02012291					
rho	0	(fraction of variance due to u_i)				

Table 18 shows that post covid period the cement industry's working capital and overall financial performance was not significantly affected through any means.

TABLE 19: Random effect model for return on asset for total research period in cement sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0002636	.0004749	-0.56	0.579	-.0011943	.0006672
app	.0003566	.0002635	1.35	0.176	-.0001599	.0008732
itid	-.000648	.0003184	-2.04	0.042	-.0012719	-.000024
lv	.021266	.009378	2.27	0.023	.0028855	.0396464
lq	.0193097	.0045024	4.29	0.000	.0104851	.0281343
sz	-2.18e-10	9.23e-11	-2.36	0.018	-3.98e-10	-3.68e-11
ir	.0416728	.1611073	0.26	0.796	-.2740916	.3574372
lsm	-.0513918	.0262514	-1.96	0.050	-.1028436	.00006
_cons	.0113258	.0190831	0.59	0.553	-.0260765	.048728
sigma_u	0					
sigma_e	.04474123					
rho	0	(fraction of variance due to u_i)				

Table 19 shows that leverage and liquidity have a significant positive correlation with return on asset that is because the cement company has a better way of revolving and covering the inflows coming via debt financing due to excess demand in real estate and building sectors however the liquidity has also a positive relation with profitability as urgent requirement of production creates need for cement industry to be more liquid. The negative significant relationship of ROA with size and inventory turnover is because inventory turnover when reduces in cement sector majorly means low production which causes decline in profitability while the size increase isn't more productive to return back investment in the cement sector.

TABLE 20: Random effect model for return on asset for pre covid period in cement sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.0007406	.0004905	1.51	0.131	-.0002207	.0017019
app	.0004271	.0002436	1.75	0.080	-.0000504	.0009046
itid	-.0006723	.0003246	-2.07	0.038	-.0013085	-.000036
sz	-3.42e-10	1.03e-10	-3.32	0.001	-5.44e-10	-1.40e-10
lv	.0261661	.0090431	2.89	0.004	.008442	.0438901
lq	.0197645	.0041652	4.75	0.000	.0116009	.0279281
ir	-.021407	.1474144	-0.15	0.885	-.310334	.2675199
lsm	-.0489177	.024087	-2.03	0.042	-.0961274	-.001708
_cons	.0166303	.0175203	0.95	0.343	-.0177088	.0509694
sigma_u	0					
sigma_e	.0380436					
rho	0	(fraction of variance due to u_i)				

Table 20 shows the negative significant relationship of ROA with size and inventory turnover is because inventory turnover when reduces in cement sector majorly means low production which causes decline in profitability while the size increase isn't more productive to return back investment in the cement sector. Leverage and liquidity have a significant positive correlation with return on asset that is because the cement company has a better way of revolving and covering the inflows coming via debt financing due to excess demand in real estate and building sectors however the liquidity has also a positive relation with profitability as urgent requirement of production creates need for cement industry to be more liquid.

TABLE 21: Random effect model for return on asset for post covid period in cement sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0011912	.0011361	-1.05	0.294	-.003418	.0010355
app	.0006021	.0009183	0.66	0.512	-.0011978	.002402
itid	-.0006111	.0007395	-0.83	0.409	-.0020604	.0008383
sz	7.56e-11	2.26e-10	0.34	0.737	-3.66e-10	5.18e-10
lv	.0010751	.0285594	0.04	0.970	-.0549003	.0570505
lq	.0280168	.0304833	0.92	0.358	-.0317294	.087763
ir	.2899222	.5910555	0.49	0.624	-.8685252	1.44837
lsm	-.1114922	.0865772	-1.29	0.198	-.2811804	.0581959
_cons	-.0384174	.0880991	-0.44	0.663	-.2110885	.1342537
sigma_u	0					
sigma_e	.04194993					
rho	0	(fraction of variance due to u_i)				

Table 21 shows that post covid period the cement industry's working capital and overall financial performance was not significantly affected through any means.

TABLE 22: Random effect model for return on equity for total research period in steel sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.0000284	9.55e-06	2.97	0.003	9.66e-06	.0000471
app	-.0000137	.0000163	-0.84	0.399	-.0000457	.0000182
itid	-.000075	.000028	-2.68	0.007	-.0001298	-.0000201
lv	.0002602	.0000578	4.50	0.000	.0001469	.0003735
lq	.0202301	.0074877	2.70	0.007	.0055545	.0349057
sz	8.36e-10	2.85e-10	2.93	0.003	2.77e-10	1.39e-09
ir	-.3957101	.1010283	-3.92	0.000	-.593722	-.1976983
lsm	-.0076454	.0165165	-0.46	0.643	-.0400171	.0247263
_cons	.0181028	.0124273	1.46	0.145	-.0062542	.0424598
sigma_u	0					
sigma_e	.02834548					
rho	0	(fraction of variance due to u_i)				

Table 22 shows the significant positive correlation of ACP, LV, LQ and SZ with return on equity in the steel sector that is because the collection period increase means more sales, high leverage means more need of financing to fulfill production needs as compared to demand, high liquidity means more opportunity to grow in terms of accepting contracts and orders and increase in size means a need of expansion to be resulted profitable, all these scenarios in steel sector increases the firm profitability however decrease in inventory turnover in days and interest rates have significant negative correlation with ROE due to decrease in production and increase in financing cost respectively.

TABLE 23: Random effect model for return on equity for pre covid period in steel sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.0001189	.0000387	3.08	0.002	.0000432	.0001947
app	-.0000549	.0000318	-1.73	0.084	-.0001172	7.42e-06
itid	-.0001116	.0000496	-2.25	0.024	-.0002089	-.0000144
sz	1.09e-09	3.62e-10	3.02	0.003	3.85e-10	1.80e-09
lv	-.003186	.0013018	-2.45	0.014	-.0057376	-.0006345
lq	.0140742	.0082759	1.70	0.089	-.0021462	.0302946
ir	-.3454618	.1035922	-3.33	0.001	-.5484988	-.1424249
lsm	-.0172694	.017082	-1.01	0.312	-.0507496	.0162107
_cons	.0274098	.0139199	1.97	0.049	.0001273	.0546922
sigma_u	0					
sigma_e	.0267769					
rho	0	(fraction of variance due to u_i)				

Table 23 shows a significant negative correlation of IR, LV and ITID with ROE while a significant positive relation of ROE with ACP and SZ also was observed. The results are in relation to no effect of covid at general market conditions and adjusted profitability.

TABLE 24: Random effect model for return on equity for post covid period in steel sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.0000173	.0000104	1.66	0.096	-3.09e-06	.0000377
app	9.44e-06	.000035	0.27	0.787	-.0000592	.0000781
itid	-.0000842	.0000603	-1.40	0.162	-.0002024	.0000339
sz	6.71e-10	4.98e-10	1.35	0.178	-3.06e-10	1.65e-09
lv	.000221	.0000629	3.52	0.000	.0000978	.0003442
lq	.0056198	.0174623	0.32	0.748	-.0286056	.0398452
ir	-.3429274	.3212541	-1.07	0.286	-.9725738	.286719
lsm	.0011772	.044878	0.03	0.979	-.0867821	.0891364
_cons	.0294016	.0375265	0.78	0.433	-.0441489	.1029521
sigma_u	0					
sigma_e	.02830594					
rho	0	(fraction of variance due to u_i)				

Table 24 shows that after covid leverage had a positive significant correlation with return on equity which indicated that after covid debt financing became the better option for steel sector companies for long term financing and maintaining their working capital needs.

TABLE 25: Random effect model for return on asset for total research period in steel sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0009063	.0001943	-4.66	0.000	-.0012871	-.0005255
app	-.000806	.0003312	-2.43	0.015	-.0014552	-.0001569
itid	.0032751	.000569	5.76	0.000	.0021598	.0043904
lv	.0425685	.0011756	36.21	0.000	.0402644	.0448727
lq	.2789038	.1522708	1.83	0.067	-.0195414	.5773491
sz	1.61e-09	5.79e-09	0.28	0.781	-9.74e-09	1.30e-08
ir	-2.724095	2.054526	-1.33	0.185	-6.750892	1.302703
lsm	-.0021333	.3358812	-0.01	0.995	-.6604484	.6561819
_cons	-.1879473	.2527225	-0.74	0.457	-.6832743	.3073796
sigma_u	0					
sigma_e	.58774888					
rho	0	(fraction of variance due to u_i)				

Table 25 shows a positive significant correlation with ITID and LV which indicates that in steel sector the longer inventory turnover accounts to be more profitable While, the correlation model in Makori and Jagongo (2013) study showed that there is Positive relationship between Return on Assets and each of (Inventory conversion period, Average payment period, sales growth, current ratio and firm's size). The longer conversion need additional external funds which result in better financing option on longer term.

TABLE 26: Random effect model for return on asset for pre covid period in steel sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	.0001201	.0001313	0.92	0.360	-.0001372	.0003774
app	.0000924	.000108	0.86	0.392	-.0001192	.000304
itid	-.000785	.0001685	-4.66	0.000	-.0011152	-.0004548
sz	5.19e-09	1.23e-09	4.22	0.000	2.78e-09	7.60e-09
lv	-.0149051	.0044205	-3.37	0.001	-.0235691	-.0062412
lq	.0411723	.0281014	1.47	0.143	-.0139055	.09625
ir	-1.285746	.3517556	-3.66	0.000	-1.975175	-.5963178
lsm	-.0796469	.0580034	-1.37	0.170	-.1933314	.0340375
_cons	.0929275	.047266	1.97	0.049	.0002878	.1855672

sigma_u	0
sigma_e	.08882577
rho	0 (fraction of variance due to u_i)

Table 26 shows significant positive correlation or size of firm with ROA indicating that steel sector is high growth potential sector and there is gap of investments available. The negative correlation of inventory turn over suggests the holding reduction is a result of low production as compared to available capacity, negative correlation of leverage shows the sector is to be financed by equity as compared to debt because complementing to that interest rate has a negative relation with ROA means debt causing high cost of financing may also result in decrease of profitability .

TABLE 27: Random effect model for return on asset for post covid period in steel sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0017988	.0003472	-5.18	0.000	-.0024793	-.0011182
app	-.0045689	.001167	-3.92	0.000	-.0068561	-.0022817
itid	.0109028	.0020098	5.42	0.000	.0069637	.0148419
sz	2.20e-08	1.66e-08	1.32	0.186	-1.06e-08	5.45e-08
lv	.0392976	.0020951	18.76	0.000	.0351912	.0434039
lq	1.316316	.582075	2.26	0.024	.1754704	2.457162
ir	4.047595	10.70846	0.38	0.705	-16.9406	25.03579
lsm	-.8455494	1.495932	-0.57	0.572	-3.777522	2.086423
_cons	-2.238514	1.250881	-1.79	0.074	-4.690195	.2131676

sigma_u	0
sigma_e	.92235861
rho	0 (fraction of variance due to u_i)

Table 27 shows that post covid the entire cash conversion cycle was highly affected by covid the ACP and APP had a negative correlation with ROA indicating the flow of funds in terms of payables and receivables were delayed and caused low profitability however inventory turnover had a positive relationship with ROA which means during covid the steel sector had enough inventory to manage supply, positive leverage and liquidity also indicating strong financial backup for steel sector companies.

TABLE 28: Random effect model for return on equity for total research period in sugar sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-9.43e-06	.0000307	-0.31	0.759	-.0000696	.0000507
app	-.0000285	.0000201	-1.42	0.155	-.0000678	.0000108
itid	4.80e-06	.0000169	0.29	0.776	-.0000282	.0000378
lv	-.0069715	.0025478	-2.74	0.006	-.0119651	-.0019779
lq	.012264	.0063692	1.93	0.054	-.0002194	.0247475
sz	-6.12e-11	8.59e-10	-0.07	0.943	-1.75e-09	1.62e-09
ir	.0391393	.0803731	0.49	0.626	-.1183891	.1966677
lsm	-.0306602	.0137491	-2.23	0.026	-.0576079	-.0037125
cons	.0151995	.0094452	1.61	0.108	-.0033128	.0337118
sigma_u	0					
sigma_e	.02114087					
rho	0	(fraction of variance due to u_i)				

Table 28 shows a negative correlation of leverage and large scale manufacturing index with return on equity because the overall leverage in terms of debt costs high to sugar industries because the cycle of production last for 6 months therefore the debt financing costs more than to produce, sugar industries rely more o equity financing. Negative correlation with large scale manufacturing rate signifies that sugar industry has a limited effect on overall index change however any other large scale manufacturing or processing may lower the profitability of sugar sector companies.

TABLE 29: Random effect model for return on equity for pre covid period in sugar sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	.0000544	.0000357	1.52	0.128	-.0000157	.0001244
app	-.0000512	.0000224	-2.29	0.022	-.0000951	-7.28e-06
itid	.0000509	.0000314	1.62	0.105	-.0000107	.0001124
sz	-4.17e-10	1.17e-09	-0.36	0.722	-2.71e-09	1.88e-09
lv	-.0076615	.0028594	-2.68	0.007	-.0132659	-.0020572
lq	.0193149	.0079178	2.44	0.015	.0037964	.0348335
ir	.0255756	.0851741	0.30	0.764	-.1413626	.1925137
lsm	-.0373573	.0149153	-2.50	0.012	-.0665907	-.008124
cons	.0100056	.0097478	1.03	0.305	-.0090997	.0291108
sigma_u	0					
sigma_e	.0207593					
rho	0	(fraction of variance due to u_i)				

Table 29 shows before covid the liquidity had a positive significant correlation with ROE which signifies that before covid the companies were fruitful in terms of maintaining liquid funds. Negative APP complements to the fact that average payments were delayed due to seasonal pressure on sugar sector which caused delay in paying off debts and lowering profitability.

TABLE 30: Random effect model for return on equity for post covid period in sugar sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.000147	.0000686	-2.14	0.032	-.0002814	-.0000125
app	.0000989	.0000872	1.13	0.257	-.000072	.0002698
itid	-.0000328	.0000265	-1.24	0.215	-.0000846	.0000191
sz	-1.75e-09	1.70e-09	-1.03	0.304	-5.09e-09	1.59e-09
lv	-.0124478	.0082128	-1.52	0.130	-.0285445	.003649
lq	.0045946	.0122288	0.38	0.707	-.0193734	.0285627
ir	-.0903032	.245134	-0.37	0.713	-.570757	.3901506
lsm	-.0188604	.0364496	-0.52	0.605	-.0903003	.0525795
cons	.0512017	.0310845	1.65	0.100	-.0097228	.1121262
sigma_u	0					
sigma_e	.01876692					
rho	0	(fraction of variance due to u_i)				

Table 30 shows that post covid the average collection period have a significant negative correlation with return on equity. This could be supported by the fact that during the covid period the overall money roll over was disturbed which delayed the receivable payments yet decreased the profitability.

TABLE 31: Random effect model for return on asset for complete research period in sugar sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-3.26e-09	.0000755	-0.00	1.000	-.000148	.000148
app	-.0000629	.0000493	-1.28	0.202	-.0001596	.0000337
itid	.0000127	.0000415	0.31	0.760	-.0000686	.0000939
lv	-.016232	.0062658	-2.59	0.010	-.0285127	-.0039512
lq	.0183043	.0156638	1.17	0.243	-.0123962	.0490047
sz	-7.13e-10	2.11e-09	-0.34	0.736	-4.85e-09	3.43e-09
ir	.0553038	.197661	0.28	0.780	-.3321046	.4427122
lsm	-.0706144	.033813	-2.09	0.037	-.1368867	-.0043421
cons	.0389042	.0232286	1.67	0.094	-.006623	.0844313
sigma_u	0					
sigma_e	.05299127					
rho	0	(fraction of variance due to u_i)				

Table 31 shows a negative correlation of leverage and large scale manufacturing index with return on asset because the overall leverage in terms of debt costs high to sugar industries because the cycle of production last for 6 months therefore the debt financing costs more than to produce, sugar industries rely more o equity financing. Negative correlation with large scale manufacturing rate signifies that sugar industry has a limited effect on overall index change however any other large scale manufacturing or processing may lower the profitability of sugar sector companies.

TABLE 32: Random effect model for return on asset for pre covid period in sugar sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
acp	.0001675	.0000885	1.89	0.058	-6.00e-06 .000341
app	-.0001067	.0000555	-1.92	0.054	-.0002155 2.01e-06
itid	.0000932	.0000778	1.20	0.231	-.0000592 .0002456
sz	-3.93e-10	2.90e-09	-0.14	0.892	-6.07e-09 5.29e-09
lv	-.016191	.0070825	-2.29	0.022	-.0300725 -.0023096
lq	.0268631	.0196116	1.37	0.171	-.011575 .0653012
ir	-.0084078	.2109691	-0.04	0.968	-.4218996 .405084
lsm	-.0843962	.0369438	-2.28	0.022	-.1568048 -.0119876
cons	.0272497	.0241444	1.13	0.259	-.0200724 .0745718
sigma_u	0				
sigma_e	.05204123				
rho	0	(fraction of variance due to u_i)			

Table 32 shows a negative correlation of leverage and large scale manufacturing index with return on equity because the overall leverage in terms of debt costs high to sugar industries because the cycle of production last for 6 months therefore the debt financing costs more than to produce, sugar industries rely more o equity financing. Negative correlation with large scale manufacturing rate signifies that sugar industry has a limited effect on overall index change however any other large scale manufacturing or processing may lower the profitability of sugar sector companies

TABLE 33: Random effect model for return on asset for post period in sugar sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
acp	-.0003479	.0001549	-2.25	0.025	-.0006515 -.0000444
app	.000229	.0001969	1.16	0.245	-.0001569 .0006148
itid	-.0000612	.0000597	-1.02	0.305	-.0001783 .0000559
sz	-6.06e-09	3.85e-09	-1.58	0.115	-1.36e-08 1.48e-09
lv	-.0378752	.0185445	-2.04	0.041	-.0742218 -.0015286
lq	.0095061	.0276128	0.34	0.731	-.044614 .0636262
ir	-.0836465	.5535149	-0.15	0.880	-1.168516 1.001223
lsm	-.0329642	.0823036	-0.40	0.689	-.1942763 .1283478
cons	.1238928	.0701891	1.77	0.078	-.0136753 .2614609
sigma_u	0				
sigma_e	.04222364				
rho	0	(fraction of variance due to u_i)			

Table 33 shows that post covid the return on asset of sugar sector companies have a significant negative relation with leverage with iterates to the fact that in any condition, sugar industry has equity as the most suitable source of financing.

TABLE 34: Random effect model for return on equity for total research period in chemical sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.0001408	.0000587	-2.40	0.016	-.0002559	-.0000258
app	.000062	.0000263	2.36	0.018	.0000105	.0001136
itid	.0000632	.0000347	1.82	0.068	-4.71e-06	.0001312
lv	.0061308	.0019547	3.14	0.002	.0022996	.009962
lq	.0019839	.0037945	0.52	0.601	-.0054532	.0094211
sz	-2.37e-11	7.12e-11	-0.33	0.740	-1.63e-10	1.16e-10
ir	-.0283755	.0327064	-0.87	0.386	-.0924788	.0357278
lsm	.0026316	.0053756	0.49	0.624	-.0079043	.0131676
cons	.0063231	.0050265	1.26	0.208	-.0035287	.0161749
sigma_u	0					
sigma_e	.00712266					
rho	0	(fraction of variance due to u_i)				

Table 34 shows a significant positive relation of APP and LV with ROE which signifies that within the chemical sector the debt financing is a better option as compared to equity as the turnover is not much longer hence cost of equity accounts expensive. The payment period increase gives more ease to firms in generating cash and rolling inventory while a negative collection period signifies the lowering of profitability on non-receiving timeline of funds.

TABLE 35: Random effect model for return on equity for pre covid period in chemical sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.0002165	.0000762	-2.84	0.004	-.0003658	-.0000672
app	.0000353	.0000327	1.08	0.280	-.0000287	.0000994
itid	.0001632	.000044	3.71	0.000	.000077	.0002494
sz	-5.42e-11	9.33e-11	-0.58	0.561	-2.37e-10	1.29e-10
lv	.0017257	.0026097	0.66	0.508	-.0033891	.0068405
lq	.0165664	.00576	2.88	0.004	.0052769	.0278559
ir	-.0430182	.0346856	-1.24	0.215	-.1110008	.0249644
lsm	.0048908	.0055817	0.88	0.381	-.0060491	.0158307
cons	.0015762	.0063999	0.25	0.805	-.0109675	.0141198
sigma_u	0					
sigma_e	.00702566					
rho	0	(fraction of variance due to u_i)				

Table 35 shows that with decrease in collection period the profitability is decreased this is due to the fact that the longer credit terms benefit the chemical companies in long term profitability however with increase in inventory turnover the profitability is increased as high stocking is made for agricultural purpose and liquid cash is available for any available project opportunity for the companies to explore.

TABLE 36: Random effect model for return on equity for post covid period in chemical sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.000102	.0000998	-1.02	0.307	-.0002976	.0000936
app	7.79e-06	.0000661	0.12	0.906	-.0001217	.0001373
itid	-.000104	.0000677	-1.54	0.124	-.0002367	.0000286
sz	1.60e-10	1.10e-10	1.45	0.146	-5.59e-11	3.76e-10
lv	.0102555	.0033782	3.04	0.002	.0036343	.0168768
lq	-.0215587	.0092932	-2.32	0.020	-.039773	-.0033444
ir	-.1488478	.0902331	-1.65	0.099	-.3257013	.0280058
lsm	-.0231861	.0135159	-1.72	0.086	-.0496769	.0033047
cons	.0339974	.0159734	2.13	0.033	.0026901	.0653046
sigma_u	0					
sigma_e	.00599394					
rho	0	(fraction of variance due to u_i)				

Table 36 shows a positive correlation of leverage with ROE as long term financing option becomes cost savvy for chemical industry however a negative liquidity relation signifies that post covid companies did not had enough leverage to cash out liquid opportunities.

TABLE 37: Random effect model for return on asset for total research period in chemical sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.0001616	.0001343	-1.20	0.229	-.0004249	.0001016
app	.0000987	.0000602	1.64	0.101	-.0000192	.0002166
itid	.0001165	.0000793	1.47	0.142	-.0000389	.000272
lv	.0303305	.0044725	6.78	0.000	.0215646	.0390965
lq	.0050199	.008682	0.58	0.563	-.0119966	.0220364
sz	-2.21e-11	1.63e-10	-0.14	0.892	-3.41e-10	2.97e-10
ir	-.0460091	.0748331	-0.61	0.539	-.1926793	.1006612
lsm	.0058811	.0122995	0.48	0.633	-.0182254	.0299877
cons	-.0080912	.0115009	-0.70	0.482	-.0306325	.0144501
sigma_u	0					
sigma_e	.016946					
rho	0	(fraction of variance due to u_i)				

Table 37 shows that leverage has a significant positive correlation with ROA which signifies that financing asset via debt is one of the key upper hand that the chemical sector has this is because at lower interest rates the companies can easily take financing and profit margins within this sectors are remarkable to cover the finance cost expense.

TABLE 38: Random effect model for return on asset for pre covid period in chemical sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0003681	.0001802	-2.04	0.041	-.0007212	-.0000149
app	.0000607	.0000773	0.79	0.432	-.0000908	.0002122
itid	.0003047	.0001041	2.93	0.003	.0001007	.0005087
sz	-6 .55e-11	2.21e-10	-0.30	0.767	-4.98e-10	3.67e-10
lv	.0198542	.0061744	3.22	0.001	.0077525	.0319559
lq	.0354061	.0136283	2.60	0.009	.0086952	.0621171
ir	-.0731592	.0820663	-0.89	0.373	-.2340063	.0876878
lsm	.0115616	.0132063	0.88	0.381	-.0143222	.0374454
cons	-.0162194	.0151422	-1.07	0.284	-.0458977	.0134588
sigma_u	0					
sigma_e	.01715523					
rho	0	(fraction of variance due to u_i)				

Table 38 shows that with decrease in collection period the profitability is decreased this is due to the fact that the longer credit terms benefit the chemical companies in long term profitability however a positive correlation of leverage and liquidity with return on asset signifies the financing benefit chemical sector companies have due to debt financing on shorter terms and enough liquidity to invest is one benefit the increased profit margins give to the chemical industry.

TABLE 39: Random effect model for return on asset for post covid period in chemical sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
acp	-.0000177	.0002184	-0.08	0.935	-.0004458	.0004104
app	7.00e-06	.0001446	0.05	0.961	-.0002764	.0002904
itid	-.0002137	.0001481	-1.44	0.149	-.000504	.0000767
sz	2.97e-10	2.41e-10	1.23	0.218	-1.76e-10	7.70e-10
lv	.0393371	.0073933	5.32	0.000	.0248464	.0538277
lq	-.0406925	.0203382	-2.00	0.045	-.0805546	-.0008304
ir	-.3119132	.1974762	-1.58	0.114	-.6989593	.075133
lsm	-.0529871	.0295798	-1.79	0.073	-.1109625	.0049883
cons	.0466704	.0349579	1.34	0.182	-.0218458	.1151867
sigma_u	0					
sigma_e	.01326809					
rho	0	(fraction of variance due to u_i)				

Table 39 shows a positive correlation of leverage with return on asset which signifies the financing benefit chemical sector companies have due to debt financing on shorter terms. Negative liquidity post covid indicates the losing of optimum funds in managing company's liquidity.

TABLE 40: Random effect model for return on equity for total research period in textile sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.0008379	.000304	-2.76	0.006	-.0014338	-.0002421
app	-.0002092	.000309	-0.68	0.498	-.0008149	.0003964
itid	-.0004638	.0001708	-2.72	0.007	-.0007985	-.0001292
lv	-.0014353	.0003739	-3.84	0.000	-.0021681	-.0007026
lq	-.0251293	.0309815	-0.81	0.417	-.085852	.0355933
sz	-7.14e-10	4.30e-10	-1.66	0.097	-1.56e-09	1.29e-10
ir	-.5968925	.2671262	-2.23	0.025	-1.12045	-.0733348
lsm	.0389872	.0440104	0.89	0.376	-.0472716	.1252461
cons	.2392799	.0408604	5.86	0.000	.159195	.3193648
sigma_u	0					
sigma_e	.05527257					
rho	0	(fraction of variance due to u_i)				

Table 40 shows a significant negative correlation of ACP, ITID, LV and IR with ROE which iterates to the fact that with decrease in conversion cycle the profitability in the textile sector is increase also with lower leverage the best way of financing for textile companies is via equity as supported by the negative correlation of IR which is due to the fact that debt may increase the over all cost of financing which results in lowering financial performance or profitability of the firm.

TABLE 41: Random effect model for return on equity for pre covid period in textile sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.0015973	.000368	-4.34	0.000	-.0023186	-.0008759
app	-.0001714	.0003089	-0.55	0.579	-.0007768	.0004341
itid	-.0008592	.0001861	-4.62	0.000	-.0012239	-.0004944
sz	-5.79e-10	5.33e-10	-1.09	0.278	-1.62e-09	4.66e-10
lv	-.0017176	.0003602	-4.77	0.000	-.0024236	-.0010117
lq	-.0573552	.0351062	-1.63	0.102	-.1261621	.0114516
ir	-.3752526	.2576859	-1.46	0.145	-.8803077	.1298024
lsm	.0061199	.0413086	0.15	0.882	-.0748434	.0870833
cons	.2980846	.0436976	6.82	0.000	.212439	.3837303
sigma_u	0					
sigma_e	.04298705					
rho	0	(fraction of variance due to u_i)				

Table 41 shows a significant negative correlation of ACP, ITID and LV with ROE which iterates to the fact that with decrease in conversion cycle the profitability in the textile sector is increased also with lower leverage the best way of financing for textile companies is via equity.

TABLE 42: Random effect model for return on equity for pre covid period in textile sector

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.0008738	.0007484	-1.17	0.243	-.0023407	.000593
app	-.000177	.0012045	-0.15	0.883	-.0025377	.0021837
itid	-.0000731	.0005384	-0.14	0.892	-.0011284	.0009822
sz	-1.19e-09	8.27e-10	-1.44	0.150	-2.81e-09	4.31e-10
lv	-.0035968	.0036655	-0.98	0.326	-.010781	.0035874
lq	-.0080614	.0778701	-0.10	0.918	-.160684	.1445612
ir	-.9319904	1.0717	-0.87	0.384	-3.032483	1.168502
lsm	.1414132	.1839992	0.77	0.442	-.2192186	.502045
cons	.2666653	.1585352	1.68	0.093	-.0440579	.5773885
sigma_u	0					
sigma_e	.08888212					
rho	0	(fraction of variance due to u_i)				

Table 42 shows no significant relation of any independent variable of profitability as the covid impact was majorly due to the pause of trade within the textile sector and caused much harm to the industry, hence there was no impact on managing WC as day to day activity was stopped and only expenses were taking place.

TABLE 43: Random effect model for return on asset for total research period in textile sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.0036228	.0020199	-1.79	0.073	-.0075818	.0003362
app	-.0026796	.0020533	-1.31	0.192	-.0067039	.0013448
itid	-.0017352	.0011346	-1.53	0.126	-.003959	.0004886
lv	-.0031317	.0024841	-1.26	0.207	-.0080004	.0017371
lq	-.174012	.2058538	-0.85	0.398	-.5774781	.2294541
sz	-1.17e-09	2.86e-09	-0.41	0.683	-6.76e-09	4.43e-09
ir	-1.703504	1.774895	-0.96	0.337	-5.182235	1.775227
lsm	.0314962	.2924233	0.11	0.914	-.541643	.6046354
cons	.9573954	.2714931	3.53	0.000	.4252787	1.489512
sigma_u	0					
sigma_e	.47230187					
rho	0	(fraction of variance due to u_i)				

Table 43 shows no direct significance of either variables on the return on asset which signifies that the profitability in terms of return on asset within the textile industry is highly volatile on multiple factors yet a certain set of sectors pertaining to make a pattern of profitability is unable to identify the direct effect or change.

TABLE 44: Random effect model for return on asset for pre covid period in textile sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.00687	.0014229	-4.83	0.000	-.0096588	-.0040813
app	-.0006622	.0011943	-0.55	0.579	-.0030029	.0016785
itid	-.0024183	.0007195	-3.36	0.001	-.0038286	-.001008
sz	-2.76e-09	2.06e-09	-1.34	0.181	-6.79e-09	1.28e-09
lv	-.0033067	.0013926	-2.37	0.018	-.006036	-.0005773
lq	-.108575	.1357265	-0.80	0.424	-.3745941	.1574441
ir	.1812451	.9962577	0.18	0.856	-1.771384	2.133874
lsm	.0737442	.159706	0.46	0.644	-.2392739	.3867622
cons	.8472418	.1689423	5.01	0.000	.5161211	1.178363

sigma_u	0
sigma_e	.1833055
rho	0 (fraction of variance due to u_i)

Table 44 shows a significant negative correlation of ACP, ITID and LV with ROA which iterates to the fact that with decrease in conversion cycle the profitability in the textile sector is increased also with lower leverage the best way of financing for textile companies is via equity.

TABLE 45: Random effect model for return on asset for pre covid period in textile sector

roa	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
acp	-.0068508	.007643	-0.90	0.370	-.0218308	.0081292
app	-.0101874	.0123004	-0.83	0.408	-.0342958	.013921
itid	.0020409	.0054987	0.37	0.711	-.0087364	.0128182
sz	-5.18e-09	8.45e-09	-0.61	0.540	-2.17e-08	1.14e-08
lv	.0189789	.0374333	0.51	0.612	-.0543891	.0923468
lq	.0684501	.7952418	0.09	0.931	-1.490195	1.627095
ir	-12.10444	10.94464	-1.11	0.269	-33.55555	9.346661
lsm	-1.011684	1.879076	-0.54	0.590	-4.694606	2.671238
cons	1.974268	1.619027	1.22	0.223	-1.198966	5.147503

sigma_u	0
sigma_e	.98181268
rho	0 (fraction of variance due to u_i)

Table 45 shows no significant relation of any independent variable of profitability as the covid impact was majorly due to the pause of trade within the textile sector and caused much harm to the industry, hence there was no impact on managing WC as day to day activity was stopped and only expenses were taking place.

5. CONCLUSION

The purpose of our research was to measure the impact of working capital management on finanvcial performance specifically in regards to Pre and Post Covid analysis. The sample data consisted of 30 non-financial sector firms listed in PSX mainly from 6 sectors Automobile, Cement, Chemical, Steel, Sugar and Textile. To measure the Firm's financial performance two proxies were taken in account ROA and ROE. The proxies measure 3 main indicators ACP, APP and ITID.

Findings of our study shows that with the first model ACP positively affected the ROE and ITID negatively affected the ROE. With the second model ACP negatively while ITID positively affected the ROA. In both the models APP was insignificant with the Firm's profitability. The controlling variables including size, leverage, liquidity, interest rate and large-scale manufacturing also influenced the significance in overall findings of the study. However, in Post covid analysis only Leverage was significant and positively correlated with firm's performance in terms of ROE while a negative correlation of ACP and positive significant correlation of ITID and LV was observed with direct effect on ROA. This highlighted that post covid debt to equity management was based on longer term debt financing and helped increase the firm's overall profitability and a managed cas conversion cycle helped supporting the sustenance of working capital activities. The results help investors in identifying the right way to wisely manage their working capital needs as suggested from the post-covid analysis the positive correlation of leverage with profitability in most cases.

The results from automobile suggests that for an efficient working capital mechanism a well-managed inventory transformation is required in which the inventory turnover should be increased as compared to inventory and a slight reduction in inventory should also be made to remove holding costs. The results from Steel sector suggests that the management should focus more on paying vendors on time and managing debtors effectively to improve the financial performance within the industry. The results from chemical sector suggests that the sector has growth potential therefore adequate funding should be managed to achieve optimum liquidity in order to finance ongoing operations.

The results from textile sector suggests that the high leverage maintaining mechanisms should be established in textile firms as most production lies within export of Pakistani textile firms an adequate payment and receivable standard should also be maintained to maximize profitability. The results from sugar sector suggests effective debt management and funds allocation policy should be crafted to maintain overall working capital and convert it into profits. The results from cement industry signifies the importance of overall cash conversion cycle management including collection period, payment period and inventory turnover along with a direct attention to be given to liquidity so that the industry can work on its optimum potential and manage its working capital need to finance its operation in a profitable way.

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