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THE RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT AND CORPORATE PERFORMANCE IN THE CHEMICAL SECTOR OF PAKISTAN

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ABSTRACT

This study indicates the relationship between working capital management and corporate performance in the chemical sector of Pakistan. For analysis purpose, the chemical sector has been selected with the data from 2013-2015 of five companies from this sector that are listed on Karachi Stock Exchange. For the investigation purpose, this study analyzes the effect of variables receivables turnover period (RTP), payables payment period (PPP), inventory turnover period (ITP), and cash conversion cycle (CCC) as a measure of working capital management (WCM) on return on equity (ROE) as a measure of corporate performance. Pooled panel data analysis, regression and correlation tests are used. This study proves that there is a significant effect of working capital management (WCM) on corporate performance in the chemical sector of Pakistan.

KEYWORDS: Working Capital Management (WCM), Receivables Turnover Period (RTP), Payables Payment Period (PPP), Inventory Turnover Period (ITP), Cash Conversion Cycle (CCC), Return on Equity (ROE).

INTRODUCTION AND BACKGROUND

Working capital management is very important in corporate finance because it is directly related to the liquidity and profitability of a firm [22]. From the last few years, the primary focus of corporate financial management literature was on the study of long term financial assets, however many studies have highlighted the topics that are related to investments, earning per share, mutual funds' performance, firm's financial structure, and firm's valuation. During that time, the short-term assets also accounted for as current assets as a major proportion of total assets in the statement of financial position of a firm. The short term assets or current assets are those assets from which future benefits are expected for less than one year. A firm ought to oversee viably and effectively its working capital on the off chance that if it is not able to oversee proficiently and adequately its working capital then this may bring about diminishment in productivity as well as lead to savage result like monetary emergency for a firm.

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At that point it's a matter of more concern and criticalness that in what capacity can firms deal with their working capital in a manner that will prompt their extreme achievement.

Every business requires short-run financial assets that will fund daily working exercises. Investments in the form of money, installments to debt holder and for inventories of a firm are called working capital. Net working capital comprises current assets and current liabilities and it helps to calculate the short-term liquidity capacity of a business. It is also used to figure out the ability of a company's management to utilize its assets in an efficient manner. Many scientists have researched to identify the impact of working capital management on corporate performance. From last three decades, some researchers have also highlighted the point of cash conversion cycle that is a leading variable of working capital. They admitted that working capital management gained less consideration of researchers in writing as compared to longer-term investments and financing choices. It engaged the major part of a fiscal director's consideration and time.

Working capital management is an essential part of financial management because it directly relates to and has effect on a firm's liquidity and profitability. In many other countries like UK, Belgian, India, Bangladesh, Germany, Sri Lanka, Kenya etc., working capital management has been focused for research purpose with different aspects in different sectors. According to Usama [26] it is very important because of many reasons. The current assets are approximately half of the firm's total asset and it is also significant to manage them in such an effective way that leads to profitability. A company with fewer current assets can face difficulties in maintaining its day to day operations. Working capital has three basic components i.e. debtors/ receivables, payables, and inventory. Debtors of a company are the most important component of working capital. Inventories are the second most important part of working capital management. They are the main pillars of working capital management. The capital invested in debtors is almost the same as that of the investment made in cash and inventories [24]. A popular measure of working capital management is cash conversion cycle that is the time span between expenditure for the purchase of raw materials and collection of sales of finished goods.

We have two primary concerns toward working capital management. First one is to manage current asset and current liabilities in such an effective and efficient way that it will not only reduce the risk of inability to meet day to day operating expenses but can also avoid huge investments in those assets that may cause loss in the form of opportunity cost. Current holding are short-lived financing that are responsible to continuously convert over into money and concerning current liabilities. Every business has a visible target to earn maximum profits. High level of inventory and smooth credit policies of a business take it to higher level of sales volume. Higher inventory eliminates the risk of stock out and smooth credit policies allow firm's customer to pay after assessing the quality of product. Account payable is also an essential component of a working capital management.

Raheman & Nasr [22] report that a firm may delay in payments to supplier to assess the quality of good purchase, in an expensive and a valuable source of financing but on the other hand in some situations it may be expensive especially when suppliers grant discount on early payments. Cash conversion cycle (CCC) is also an essential component of measuring working capital management. Working capital has main contribution towards cash conversion cycle (CCC). Both are positively related because as investment level increases the cash conversion cycle (CCC) will also increase. Cash conversion cycle (CCC) can also easily affect the performance of a company in terms of profitability because a longer cash conversion cycle increases firm's profitability but

cash conversion cycle can also lead to reduction of the profitability if the cost of CCC increases from its benefit [26]. Chemical sector is neglected in the past researches so, there is very little research found on this sector in the world.

THEORETICAL FRAMEWORK

This section explains the theoretical framework for analyzing the relationship between chosen variables. The theoretical framework is the core stage where the whole research project is based. It highlights the network of relationships among the variables that are important for the study of given problem. This framework shows the relationships between return on equity (ROE) and receivables turnover period (RTP), payables payment period (PPP), inventory turnover period (ITP), cash conversion cycle (CCC). In this study the receivables turnover period (RTP), payables payment period (PPP), inventory turnover period (ITP) and cash conversion cycle (CCC) are independent variables and return on equity (ROE) is a dependent variable.

HYPOTHESIS

For this research we make a hypothesis. Basically, research hypotheses are predictive statements about the relationship between two variables. Hypotheses are of two types: alternative hypothesis which means that there is a relationship between variables, and null hypothesis which means that there is no relationship between variables.

MAIN HYPOTHESIS

H_1: There is a relationship between working capital management and corporate performance.

$H_{0:}$ There is no relationship between working capital management and corporate performance.

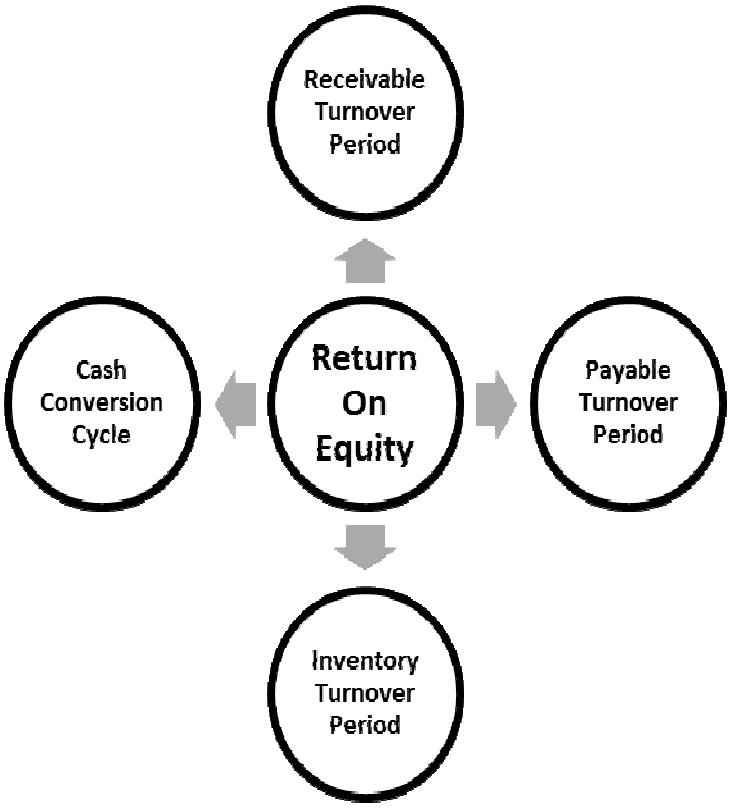

Figure 1.Theoretical Framework for analyzing the Relationship between Chosen Variables

SUB HYPOTHESIS

Following are the sub hypothesis for this study:

HYPOTHESIS 1

H_{11}: There is a relationship between receivables turnover period and return on equity.

$H_{01:}$ There is no relationship between receivables turnover period and return on equity.

HYPOTHESIS 2

H_{12}: There is a relationship between payables payment period and return on equity.

$H_{02:}$ There is no relationship between payables payment period and return on equity.

HYPOTHESIS 3

H_{13}: There is a relationship between inventory turnover period and return on equity.

$H_{03:}$ There is no relationship between inventory turnover period and return on equity.

HYPOTHESIS 4

H_{14}: There is a relationship between cash conversion cycle and return on equity.

$H_{04:}$ There is no relationship between cash conversion cycle and return on equity.

LITERATURE REVIEW

Working capital management is exceptionally an essential part of corporate finance on the grounds that it directly impacts the liquidity and profitability of the organization. It manages current assets and current liabilities. There exists a risk of inability to meet due short term liabilities on one hand and to avoid excessive investment in these assets on the other hand [18]. Many overviews have demonstrated that managers invest impressive time on regular issues that include working capital choices. One purpose behind this is that current holdings are brief ventures that are constantly being changed over into different assets types. With regard to current liabilities, the firm is responsible for paying these obligations on a timely basis.

Working capital management is one of the most important decisions taken by the finance manager. It straightly influences the profit ratio and performance of a company. It plays a major part in making financial decisions [12]. Net working capital is the excess of current assets over current liabilities of a firm. It highlights the capability of a firm and its liquidity position that means if the firm has more working capital then more is the liquidity of the firm. According to him, the working capital management could be permanent or temporary. Permanent working capital is the amount of current assets that a company must comprise for over a longer period of time to set off its current liabilities and temporary working capital is the surplus of current assets that are required to meet seasonal current liabilities [18].

Joshi [15] reported that it includes an alternative of the quantity and composition of current assets and the financing of these assets. It is compulsory for a firm to keep up a harmony between liquidity and profitability while directing its regular operations. A basic goal of any firm is to augment the benefit. In any case, saving liquidity of the firm is a paramount goal as well. The issue is that expanding profitability at the expense of liquidity can bring serious problems to the firm. Accordingly, there must be a set off between these two destinations of the organizations. One target ought not to be at expense of the other on the grounds that both have their essentialness.

Working capital administration is of specific criticalness to the little business with restricted access to the long haul capital markets. "Trade credit may stimulate sales on the grounds that it permits clients to evaluate item quality before paying" (Shin, 1998). An alternate component of

working capital is accounts payable. Deferring installments to suppliers permits a firm to survey the nature of purchased items and could be a modest and adaptable wellspring of financing for the firm. Administration of working capital which points at keeping up an ideal harmony between each of the working capital segments, that is, money, receivables, stock and payables is a crucial piece of the general corporate procedure to make esteem [6].

Broad investigation found that working capital administration has been done in both public and private divisions incorporating Multinational Companies in Bangladesh. Mohiuddin [21] had furthermore done a study on cash plan. The cardinal objectives of arranging can't avoid being organizing, encouraging, and controlling, all these three are there in cash plan. Consequently, the practicality of cash arrangement minimizes liquidity issues. Islam and Rahman [13] had an article on "Working Capital Trends of the Selected Enterprises in Bangladesh". Perfect working capital engages a business to have its credit standing and licenses the commitments portions on the date of its advancement and serves to keep itself acceptably in liquid position which enables the business to force in getting from the banks. It is like manner serves to keep up all-round capability in operations. Of all parts of budgetary administration, working capital organization is the fundamental one.

The preservation of money at an attractive level with the end goal of settling liabilities on prime of life and utilizing the speculation open doors are characteristic of the adaptability of the investment element. In addition, the accessibility of material required for creation so as to empower the substance to give the needs of its clients is demonstrative of the importance of working capital. As settled by Padache [23], proficient administration of working capital is fundamental for the achievement and survival of organizations to upgrade execution and commitment to financial development.

Garcia-Terrell and Marines-Solano [9] insisted in their study the significance of working capital administration to corporate productivity by giving exact proof on the impacts of working capital administration on the benefit of Spanish firms. They showed in their study how chiefs can enhance benefit by shortening the money transformation spin through stock decrease and reduction in the remarkable number of day's receivables. Any choice made by the administrators of the substance in this setting fundamentally influences return of the element stock which might convert organization esteem and eventually capital administration expands shareholders riches [19].

Eljelly [8] reported that the study found that the money transformation cycle was of more criticalness as a measure of liquidity than the current proportion that influences productivity. The size variable was found to have critical impact on benefit at the business level. The results were steady and had essential ramifications for liquidity administration in different Saudi organizations. In the first place it was clear that there was a negative relationship between productivity and liquidity pointers, for example, current degree and trade hole in for spendable dough the Saudi specimen inspected. Second, the study additionally uncovered that there was incredible variety among commercial enterprises concerning the noteworthy measure of liquidity.

Deloof [6] was of the opinion that most firms had large investment of resources into working capital. It can along these lines be normal that the path in which working capital is overseen will have a significant effect on profits of those organizations. He used correlation and regression tests and analyzed a significant negative relationship between gross operating income and the amount of days accounts receivable, and inventories and accounts payable of Belgian firms. On premise of these results he recommended that directors could make esteem

for their shareholders by lessening the amount of day's accounts receivable and inventories to a sensible least. The negative relationship between accounts payable and gainfulness is steady with the view that less beneficial firms hold up more to pay their bills.

Jose et al. [14] highlighted that productive working capital management (WCM) was exceptionally vital for making quality for the shareholders. The way working capital was overseen had a noteworthy effect on both profitability and liquidity. The relationship between the length of Net Trading Cycle corporate profitability and danger balanced stock return was analyzed utilizing connection and relapse investigation by industry and capital power. They discovered a solid negative relationship between lengths of company's net-trading cycle and its benefit. Also shorter net trade cycles were connected with higher danger balanced stock returns.

Deloof [6] reported that the individuals who advertised working capital hypothesis imparted that profitability and liquidity included the notable objectives of working capital administration. The issue emerged in light of the fact that the expansion of the organization's returns could genuinely undermine its liquidity and the quest for liquidity tended to weaken returns. This article assessed the relation between traditional and option working capital measures and rate of return (ROI) particularly in modern firms recorded on the Johannesburg Stock Exchange (JSE). The issue under examination was to judge whether the late created option working capital ideas demonstrated enhanced relationship with rate of return to that of conventional working capital degrees or not. Results demonstrated that there were no huge contrasts amongst the years concerning the free variables. The results of their stepwise regression corroborated that total current liabilities divided by funds flow accounted for most of the variability in Return on Investment (ROI).

The conclusions are in affirmation with Deloof [6], Eljelly [8], and Jose et al. [14], who discovered a solid negative relationship between the profitability and the average collection period inventory turnover in day's average payment period and cash conversion cycle with corporate profitability. The test results explained that a traditional working capital influences proportion, current liabilities separated by trusts stream, showed the best cooperation with degree of profitability. Well-known liquidity concepts such as the current and quick ratios registered insignificant associations whilst only one of the newer working capital concepts, the comprehensive liquidity index indicated significant associations with return on investment. All the above studies provide us a solid base and give us an idea regarding working capital management and its components. They also give us the results and conclusions of those researches already conducted on the same area for different countries and environment from different aspects. On the basis of these researches done in different countries, we have developed our own methodology for research.

Chisti [3] inspected the impact of distinctive variables of working capital administration including the Debt degree, Average gathering period, Inventory turnover in days, Average installment period, Cash change cycle, and Current proportion on the net working capital of specimen firms. He took the sample of 16 Indian firms, from different sectors, listed on BSE over a time span of five years from 2006 to 2011. Enlightening and regression are utilized for examination. The results indicate that there is a solid negative relationship between variables of the working capital administration and productivity of the firm with the exception of the deals (size of the organization). We additionally find that there is a positive relationship between

size of the firm and its benefit. There is additionally a noteworthy negative relationship between stock turnover in days and its benefit. Sufficient and viable administration of working capital has dependably been connected with the budgetary strength of all business.

Garcia-Teruel and Martinez-Solano [9] considered the effects of working capital organization on the addition completion of an illustration of little and medium-sized firms (SMEs) from Spain covering the period 1996 - 2002. They found that administrators can make regard by reducing their inventories and the measure of days for which their records are exceptional. Also, shortening the cash change cycle similarly improves the organization's benefit.

Raheman and Nasr [22] have picked an example of 94 Pakistani firms recorded on Karachi Stock Exchange for a period of 6 years from 1999-2004 to study the effect of different variables of working capital organization on the net working profit. From outcome of the study, they showed that there was a negative connection between variables of working capital organization including the typical aggregation period, stock turnover in days, ordinary social event period, cash change cycle and profit. In addition, they also exhibited that size of the firm, measured by basic logarithm of offers, and increase completion had a positive relationship.

Afza and Nazir [1] made an attempt to investigate the standard relations between working capital organization courses of action and an organization's gainfulness. He took the sample of 204 non-budgetary firms listed on Karachi Stock Exchange (KSE) for the period 1998-2005. His study ran across critically among their working capital essentials and financing methodologies transversely over unique organizations. Likewise, backslide result ran across a negative relationship between the gainfulness of firms and level of forcefulness of working capital financing and financing game plans. They prescribed that chiefs could crease regard if they get a dynamic procedure towards working capital financing and its procedures.

Kumar [16] examined this relationship of WCM and gainfulness by taking information of five years of non-fiscal organizations listed at Istanbul Stock Exchange. He examined 127 organizations which gave aggregate of 635 perceptions. CCC was utilized as a measure of WCM and for gainfulness ROA went about as a measure. The result demonstrated that effective administration of CCC will give more terrific returns. From the past studies it is apparent that analysts utilized the bookkeeping proportions as a substitute to check the relationship between WCM and productivity. Most every now and again ROA, ROE, ROIC, and Tobin's Q are the substitutes utilized for benefit and CCC, CATA, ITO, DTO, and CR are the variables utilized for WCM. The technique embraced by the dominant part of scientists to inspect the relationship is correspondence investigation, OLS relapse and numerous relapse dissections. The results demonstrate that diverse substance of WCM show distinctive association with gainfulness substitutes and it is hard to finish up the careful relationship of WCM with profitability.

According to Eljelly [8], working capital management is one of the most important areas while making the liquidity and profitability comparisons among firms involving the decision of the amount and composition of current assets and the financing of these assets. The greater the relative proportion means strongly relationship of liquid assets the lesser the risk of running out of cash all other things being equal. All individual components of working capital including cash marketable securities account receivables and inventory management play a vital role in the performance of any firm. Shin and Soenen (1998) argued that efficient working capital management is very important to create value for the shareholders while D'souza [7] emphasized

that profitability and liquidity are the salient goals of working capital management.

Alipour [2] researched the impact of working capital management on the performance of firms that were listed on the Tehran Stock Exchange. According to him, decision making is one of the fundamental roles that are performed by the senior management of a company. Decision making plays a dominant role in financial affairs. It is not common in working capital management. Designing and developing the strategies for working capital management influence the improvement of the firm's daily operating activities. The fundamental goal of this research was to encounter evidence about the effect of working capital management on the firm's performance. The performance evaluation determines the refined economic value added and market value added. He took a sample of the listed companies on the Tehran Stock Exchange for a five year period from 2006 to 2010. The regression results represent that there was an inverse relationship between net operating profitability and average payment period. But, the variables of working capital management and market value added were significantly associated. In simple words, the managers might enhance the firm's performance by declining the liquidity cycle.

Muchalsaki (2013) reported that a famous measure of working capital management (WCM) is the cash conversion cycle, i.e. the time slack between the use for buying of crude materials and the gathering of offers of completed products. A more drawn out money transformation cycle power builds productivity in light of the fact that it prompts higher deals. Notwithstanding, corporate productivity may likewise diminish with the money transformation cycle, if the expenses of higher speculation in working capital climb speedier than the profits of holding more inventories what's more/ or giving more exchange credit to clients. This talk of the criticalness of working capital administration, its diverse parts, and its consequences for productivity lead us to the issue proclamation which we will be breaking down.

Firms may have a perfect level of working capital that increases their value. Sweeping stock and a liberal trade credit technique may provoke high arrangements. Greater stock diminishes the risk of a stock-out. Trade credit may engage bargains in light of the way that it allows customers to assess a thing's quality before paying [14]. A substitute fragment of working capital is account payable. Conceding portions to suppliers allows a firm to review the way of acquired things, moreover may be a temperate and versatile wellspring of financing for the firm. Then again, late portion of receipts could be extravagant if the firm is offered a refund for right on time portion.

Shin and Soenen (1998) highlighted that proficient working capital management (WCM) was extremely paramount for making worth for the shareholders. The way working capital was overseen had a critical effect on both productivity and liquidity. The relationship between the length of Net Trading Cycle corporate productivity and danger balanced stock return was inspected utilizing association and regression examination by industry and capital power. They discovered a solid negative relationship between lengths of the association's net-exchanging cycle and its gainfulness. Also shorter net exchange cycles were connected with higher danger balanced stock returns.

As per Shin (1998), there is a huge relationship between the forcefulness conservativeness of working capital approaches of firms and their working and budgetary danger. "The study explored the relationship between the normal installment period and accumulation period working capital approaches for 208 open constrained organizations recorded at Karachi Stock Exchange. The effect of forceful traditionalist working capital financing and

financing strategies has been inspected through cross-sectional relapse shows between working capital arrangements and gainfulness and danger of the organizations." These results are further accepted by inspecting the effect of forceful working capital policies on business sector measures of benefit which was not tried in the recent past. The aftereffects of Tobin's were in line of the bookkeeping measures of profitability and processed practically the same results.

Shin (1998) reported that forceful possession means stock turnover in day's administration which brings about capital being minimized in present possessions versus long haul ventures. This has the desire of higher profits however more stupendous liquidity hazard. As an option a more moderate arrangement puts a more excellent extent of capital in fluid stakes yet at the tribute of some benefit. To measure the level of forcefulness, the current resource for aggregate stake proportion is utilized with easier degree significance a feeble relationship generally more forceful arrangement. Forceful financing strategies use more elevated amounts of typically lower cost transient obligation and less long haul capital. Albeit bringing down capital expenses this expands the danger of a transient liquidity issue. A more progressive strategy utilizes higher expense capital however delays the main reimbursement of obligation or evades it altogether transporting value. The aggregate current obligation to aggregate holding proportion is utilized to measure the level of forceful financing arrangement with a high degree being generally more forceful.

As per Shin (1998), this is a valuable presentation when examining general working capital standards and danger/ return ideas. Little information is accessible however demonstrating what particular working capital arrangements are really trailed by commercial enterprises. This exploration analyzes the working capital financing and financing of a cross-area often separate businesses over a ten year period. The basic role is to figure out whether critical industry contrasts exist in working capital approaches. Likewise investigated is whether a propensity exists for commercial enterprises succeeding forceful financing approaches to additionally take after forceful financing arrangements. At long last, the security of working capital strategies about whether will likewise be researched. There is additionally a solid inclination that a more forceful approach in one region is adjusted by a more traditionalist approach in the other.

DATA AND METHODOLOGY

This study used quantitative research methodology. The research is conducted on the chemical sector in Pakistan. Following are the parts of research methodology:

RESEARCH APPROACH

Quantitative research approach is used for this research because it is used to explain the quantitative facts that are mathematically collected. It is a study that includes the explanation of numerical data with the help of statistical expertise. Quantitative data normally exists in numerical form such as averages, ratios, or ranges. Mostly this research is practical when carrying out a large scale evaluation or survey. It is also independent of the researcher and one should get same findings no matter who carries out the research [4].

POPULATION & SAMPLING

POPULATION

There are many corporate sectors in Pakistan but due to lack of resources this study cannot deal with all, so one sector is taken as population for this study. The target population for this study is the corporate firms of chemical sector in the areas of Pakistan. There are many companies in relevant sector of Pakistan but these all cannot be targeted. Due to insufficient resource, privacy of the institutions, lack of time and other factors,

there is a big problem to collect data from all the companies. The study focused on those companies which are listed at stock exchange. In Karachi stock exchange the listed companies in chemical sector are 33. These all companies are included in population for this study.

SAMPLING

There are many companies in the chemical sector of Pakistan which are listed with stock exchange. It's a big population so this study uses sampling for data collection purpose. Random sampling technique is used to gather required information. It is the purest form of probability sampling. Each member of the population will have an equal and known chance of being selected. This allows identifying every member of the population to reduce the biasness from the pool of subjects. The sample size is 5 companies from chemical sector listed with Karachi stock exchange and having 3 years annual reports publication about their financial positions.

DATA COLLECTION AND INSTRUMENT

The secondary data is used for this study as per the study requirements. Data collection tools used in this survey research comprised of annual reports of 3 years from 2013-2015 of 5 companies to investigate the impact of working capital management (receivables turnover period, payables payment period, inventory turnover period, and cash conversion cycle) on corporate performance (return on equity as main variable). The reason to choose annual reports is that it provides all required information and data which is useful for the research of study. It also describes a population by providing a quantitative description of some fraction of the sample. This enables generalizing the finding from a sample of companies to a population.

DATA ANALYSIS TECHNIQUES

EVEIWS version 5 is used for data analysis as the instrument of data collection for this study is annual reports. The following two types of analyses are performed on data:

- Descriptive Analysis
- Inferential Analysis

DESCRIPTIVE ANALYSIS

In order to identify the data stationery of whole data and error checking, descriptive analysis is conducted. For the purpose of implementation of descriptive analysis first required information and data is found from annual reports, and it is converted into excel sheet for further analysis which is required for this study. Pool Panel Data analysis tool is used as research design. Pool Panel least square test checks whether data is stationery or not. The stationery of data is defined by significance (prob.) value and every variable has a prob. value. If the value of prob. is less than 0.05 then it is significant it shows data is stationery and if the value of prob. is more than 0.05 than it is not significant it shows data is not stationery.

INFERENTIAL ANALYSIS

For the purpose of data analysis of this study, inferential analysis is used to make inferences about a population from a sample based on the statistical relationships. Inferential statistics is used to test some hypothesis - to check relationship between variables (two or more), to generalize the results about a population from a sample, to make predictions about future, and to make conclusion. Correlation model is applied to gauge the degree of correlation among various variables. Pearson correlation coefficient is used to analyze the relationship between variables. The positive correlation shows that when one variable increases other will also increase, and negative correlation shows that if one variable increases then other will not. In inferential analysis, regression test is also applied to measure the relationship among variables for all five variables to see the relationship between

dependent variable return on equity and the independent variables receivables turnover period, payables payment period, inventory turnover period, and cash conversion cycle. Multiple regressions are used to check the contribution of independent variable in the dependent variable as together.

RESEARCH LIMITATIONS

Following are the limitations of this research study:

- The research was conducted only in corporate of chemical sector of Pakistan.
- Due to short time period, all the tests were not applied on data for analysis purpose.
- The findings of research may not be generalized in other areas outside Pakistan as it was conducted in areas of Pakistan.
- Due to insufficient resource, privacy of the institutions, lack of time, and other factors, the data is not collected from all the companies, and the study is focused on those companies which are listed on stock exchange.
- The findings of research may not be generalized in other sectors of Pakistan as it was conducted only in chemical sector.
- Limited variables are used as a measure of working capital management.
- Only one variable return on equity is used as measure of profitability while there are many other variables e.g. return on assets, net profit etc. which were ignored.
- The data was collected from limited companies and for a limited time period.

FUTURE RESEARCH

The examination of background information helped to identify the key variables (receivables turnover period, payables payment period, inventory turnover period, and cash conversion cycle) as independent variables and return on equity as dependent variable for this study [22]. It also helped to identify the relationship between selected variables in chemical sector of Pakistan. Following are the some possible areas on which research can be conducted in future and this study will help researchers in their research studies:

- In future, research studies can be conducted with other variables like net profit, operating profit, total asset turnover, return on total assets and return on fixed assets etc. [26].
- In future, research studies can be conducted in other sectors of Pakistan as this study is limited to the companies of chemical sector of Pakistan only due to limited availability of resources.
- A study can be conducted in future on complete population of the chemical sector as this study is restricted to three years data of five sample companies listed on Karachi stock exchange.

RESULT AND ANALYSIS

DESCRIPTIVE ANALYSIS

The descriptive statistics explain the trend of working capital management, profitability between the sample companies and it is also considered as a standpoint that provides suggestions after highlighting relationships among the variables of correlation and regression analyses. It highlights the average and standard deviation of distinct variables of interest. It also shows the minimum and maximum values of the variables which helps in obtaining a clear picture related to the maximum and minimum values a variable can obtain. Table 1 shows the descriptive statistics for five chemical companies in Pakistan for over a period of three years from 2013 to 2015.The research has taken five variables for the analysis purpose.

Table 1 shows the values of all independent and dependent variables. The mean value of return on equity is 17.63% of total assets. The standard

deviation is 39.49% which represents that the mean value of profitability can diverge on both sides by 39.49%. The return on equity has a minimum value of -42% and a maximum value of 80%.

Table 1.Values of all Independent and Dependent Variables

Variables		**Min.**	**Max.**	**Mean**	**S.D.**
Dependent	Return On Equity (ROE)	-0.425000	0.800600	0.176353	0.394913
Independent	Receivable Turnover Period (RTP)	3.000000	68.00000	30.040000	23.16105
Independent	Payable Payment Period (PPP)	3.000000	154.0000	47.88667	38.41192
Independent	Inventory Turnover Period (ITP)	2.000000	78.00000	44.07667	25.24304
Independent	Cash Conversion Cycle (CCC)	2.000000	127.0000	47.16267	44.68145

Similarly, the remaining four measures of working capital management i.e. cash conversion cycle (CCC), accounts receivable period (ARP), inventory conversion cycle (ICC), and accounts payable period (APP) are also shown in that table.

Account receivable period is an assessment for collection policy. The average accounts receivable period of sample companies are 30.04 days. It means that the sample companies have to wait for average 30.04 days in order to recover cash from their receivable/ clients. In order to recover cash from debtors the mean value of accounts receivable can vary by 23.16 days on both sides. The accounts receivable period's minimum and maximum value of sample companies are from 3.0 days to 68.0 days.

Accounts payable period of sample companies have an average of 47.88 days. It means that the sample companies required 47.88 days in order to pay off their creditors. The standard deviation of accounts payable period is 38.41 days. In order to pay cash to their creditors, the mean value of accounts payable can vary by 38.41 days on both sides. The minimum and maximum accounts payable period of sample companies varies from 3 days to 154 days.

Inventory conversion period of sample companies have an average of 44.07 days. It means that the sample companies required 44.07 days in order to sell their inventory. The standard deviation of inventory holding period is 25.24 days. In order to sell inventory the sample companies have a mean value of inventory conversion period that can vary by 25.24 days on both sides. The minimum and maximum number of days required by sample companies to sell inventories varies from 2 days to 78 days.

Similarly, **cash conversion cycle** has an average 47.16 days to convert cash. It has a standard deviation of 44.68 days. For cash conversion, the sample companies have a mean value of cash conversion period that can vary by 44.68 days on both sides. The minimum and maximum number of days required by sample companies for cash conversion are from 2 days to 127 days. The minimum value of 2 days shows that a firm records a large inventory turn-over and/ or cash collections from credit sales before making a single payment for credit purchases. It means that the accounts receivable period and/ or the inventory holding period are very short and/ or the accounts payable period of the firm is very long. On the other hand, the maximum time for cash conversion period is 127 days which is a very long period.

INFERENTIAL ANALYSIS

Prior to regression result, it is important to check the correlation between different variables on which the analysis is built. Pearson's Correlation matrix is used for data analysis to see the direction of relationships between variables such as those between working capital management and firm financial performance (profitability measure).

CORRELATION

Table 2 shows the Pearson's Correlation Coefficient Matrix. It shows that there is a negative correlation between return on equity, receivable turnover period, payable payment period, and inventory turnover period. There is a positive relationship between return on equity and cash conversion cycle.

Table 2.Pearson's Correlation Matrix

	V5	V4	V3	V2	V1
V5	1				
V4	0.020	1			
V3	-0.33	0.75	1		
V2	-0.083	0.72	0.70	1	
V1	-0.45	0.79	0.58	0.52	1

Table 2 presents the result of the correlation analysis of profitability measures with cash conversion period, inventory turnover period, account receivable period, and accounts payable period.

The analysis of correlation matrix started between the cash conversion cycle which is a comprehensive measure of working capital and return on equity. In the methodology part of this study, it was hypothesized that cash conversion cycle (CCC) has significant impact on firms' financial performance. In agreement with the research hypothesis, Table 2 shows positive correlation coefficient between cash conversion cycle and return on equity. From the table, one can notice that correlation coefficients of cash conversion cycle with return on equity are 0.0141 and the *p* value is 0.021. It is significant at ά. = 5%. It means that if the firm is able to increase this time period known as cash conversion cycle, it can increase its profitability. As a result cash conversion cycle and return on asset have significant association.

Table 3.Values of the Coefficients for all the Variables

Dependent Variable: V5				
Method: Panel Least Squares				
Date: 12/21/16 Time: 18:50				
Sample: 2013-2015				
Periods included: 3				
Cross-sections included: 5				
Total panel (balanced) observations: 15				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
V4	0.014114	0.0034	4.151176	0.0218
V3	-0.01872	0.003915	-4.78161	0.0351
V2	-0.00111	0.001586	-0.69924	0.5107
V1	-0.101737	0.016996	5.985938	0.0159
C	0.397618	0.185382	2.144858	0.0456
Effects Specification				
Cross-section Fixed (Dummy Variables)				
R-squared	0.981477			
Adjusted R-squared	0.956779			
F-statistic	39.73911	Durbin-Watson stat		2.667771
Prob (F-statistic)	0.000122			

As stated above, correlation results between inventory turnover period, account receivable period, and accounts payable period with return on equity have negative result. It shows that any increase in any of these factors will reduce the profitability measure (ROE) of firms. As it has been stated in the methodology part of this study, it was hypothesized that inventory turnover period has significant impact on return on equity. In agreement with this hypothesis, the correlation table indicates that inventory turnover period has negative significant impact on return on equity. The correlation coefficients are -0.018 and *p* value is 0.0351 showing that it is highly significant at ά. = 5%.

Likewise, in the methodology part of this study, it was hypothesized that accounts payable periods have significant impact on profitability as measured by return on equity. The correlation matrix in the above table shows negative insignificant impact between accounts payable period and profitability measures, which means that if firms delay their payments they will earn less profits; the reason behind this is that firms can take advantage of discounts by paying soon. As it has been shown, account payable period has negative relationship correlation coefficients of -0.001 and *p* value is 0.510 with return on equity, showing that it is insignificant at ά. = 5%.

The other hypothesis was that the way how receivables are managed has effect on profitability of firms measured by return on equity. In view of that, the result of the correlation matrix in Table 3 indicates that the account receivable period is negatively correlated with return on equity. This relationship is also verified by the correlation coefficients of -0.101 with return on equity, and *p* value of 0.015 significant at ά = 5%.

The results of correlation analysis indicate that as far as chemical sector of Pakistan is concerned, the working capital management has significant impact on their performance. Hence, null hypothesis return on equity (ROI) is rejected. The overall correlations results imply that there is existence of significant correlations between working capital components (i.e. cash conversion cycle, inventory turnover period, account receivable period and account payable period), and firm's profitability (return on equity).

REGRESSION TEST

Regression test is applied for all five variables to see the relationship between dependent variable return on equity and the independent variables receivables turnover period, payables payment period, inventory turnover period, and cash conversion cycle. Table 3 has 3 values, the first value of Prob. (F) is the probability that the null hypothesis for the full model is true or not, as the value is 0.000122 which is less than from 0.05 which means that a relationship exists between dependent and independent variables. The second value Durbin-Watson for autocorrelation is a statistic that indicates the likelihood that the deviation (error) values for the regression have a first-order auto regression component. The regression models assume that the error deviations are uncorrelated. The Durbin-Watson statistic value is more than 2 which indicates autocorrelation. The third value of adjusted R square shows that all the independent variables bring a combine change of 95.67% in return on equity.

DISCUSSION

This research is conducted to analyze the impact of working capital management on the corporate performance in the chemical sector of Pakistan. The primary purpose of this study is to examine the relationship between selected independent variables (receivables turnover period, payables payment period, inventory turnover period and cash conversion cycle) as measure of working capital management and dependent variable (return on equity) as measure of corporate performance/ profitability in chemical sector of

Pakistan. The main focal area of this research is the chemical sector of Pakistan only.

The present study is important as every business needs short-run financial resources to finance daily operating activities. The corporate performance primarily depends on the way how it manages its working capital. Numerous scientists have looked into the impact of working capital administration on corporate performance in the previous three decades after the work done by some researchers highlighted the point of "cash conversion cycle" which is the dominant variable of working capital. They clarified that even though working capital administration gained less consideration of researchers in the writing than longer-term investments and financing choices, it engaged a major part of a fiscal director's consideration and time. The analysis of background information is essential because it was expected that it would be viable to highlight the relationship between variables in the chemical sector of Pakistan.

CONCLUSION

Based on the findings of this study, the study provides a conclusion that there is a significant relationship between working capital management and corporate performance in chemical sector of Pakistan. This study used return on equity as dependent variable and receivables turnover period, payables payment period, inventory turnover period, and cash conversion cycle as independent variable. For the purpose of analysis, different tests are applied. To check the stationery of data the pool panel data test is used. Correlation is used to check the direction of relationship between variables. Regression test is used to see the relation between dependent and independent variables by checking the acceptance or rejection of hypothesis.

After analyzing the data it was found that the prob. (F statistic) value is significant and the null hypothesis was rejected which indicates that there is a significant relationship between the variables. The value of adjusted R square shows that the working capital management has a major impact on corporate performance in chemical sector of Pakistan. The value of adjusted R square shows that all the independent variables bring a combined change of 95.67% in return on equity. In a nutshell, it can be concluded that performance of a corporate in chemical sector of Pakistan is influenced by working capital management with the above mentioned variables as measure, as the previous studies also found the relationship between working capital management and profitability by using these variables in different sectors of different countries.

RECOMMENDATIONS

On the basis of the present study, the following recommendations are extracted:

- According to the study there is a significant relationship of receivables turnover period with the level of corporate profitability of chemical sector in Pakistan. It is recommended that firms should be very efficient in collecting proceeds of credit sales from their debtors. The quick cash conversion will provide for quick reinvestment in short-term securities in order to boost profitability.
- Particular norms for working capital management should be followed to reduce the market risk.
- Liquidity management activities may be more organized through using idle funds for productive investments.
- Horizontal analysis and vertical analysis through ratio techniques would be more meaningful for companies to check their performance.
- The other future studies should focus on some new variables which affect the profitability of firm.

- Financial information system should be introduced to develop financial discipline in working capital management.
- Working capital norms for maintaining optimum quantity of raw materials, work in progress, finished goods & store and spares are to be developed.
- Financial forecasting, planning and control devices are to be more intensive to enhance the efficiency of cash management.
- This study covered only five companies with three years data, so further research can be conducted on the same topic with different companies and extending the years of the sample and sample size also.
- If these companies want to increase their profitability, they will have to stable their cash conversion cycle up to required limits.
- A comprehensive and consistent industrial chemical vision and policy is necessary for a period of at least next 20 – 25 years e.g. as is the case of India, it may increase its life and profitability.

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