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Impact Of Working Capital Management On Firms' Profitability And Liquidity: A Critical Assessment

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ABSTRACT
Working capital is essential for making important financial choices. An integral part of managing working capital is ensuring that it remains liquid on a day-to-day basis. Today's business is all about keeping the ship afloat and paying the bills. Therefore, it is important to evaluate the aspects involved in working capital management, such as the time it takes to collect receivables, store and sell inventory, pay bills, and convert cash. This study's overarching goal is to determine how changing the days of collection, payment, conversion to inventory, sales, and finally the cash conversion cycle affects a company's profitability and liquidity.

Keywords: working capital, profitability, liquidity, receivables collection period, inventory holding period, payables payment period, cash conversion cycle.

1. INTRODUCTION

Working capital is the money that is available for an organization's daily operations. The difference between current assets and current liabilities is known as working capital.
(Inventory + Receivables + Cash)-Payables = Working capital
Current assets and current liabilities can be managed through working capital management. Working capital management can help to lower the risk of insolvency and increase the return on assets.

Its components are:

- Inventory
- Receivables
- Cash
- Payables

Inventory + Receivables + Cash = Current assets
Payables + Overdraft (In case cash balance is nil) = Current liabilities

Working capital investment is a cost for the company and these costs can be expressed either as:

- Cost of funding the working capital.
- The opportunity cost of lost investment opportunities.

The balancing act between current assets and liabilities can be seen as a trade-off between cash flow versus profits, or liquidity versus profitability. In working capital management act, liquidity focuses on having sufficient current assets so as to minimise the risk of insolvency. Whereas, on the other hand profitability focuses on having fewer current assets in order to maximise return.

1.1 Approaches towards working capital management.

When a company pursues an aggressive strategy, it maintains low levels of working capital, which translates to high levels of current liabilities and low levels of current assets. A cautious strategy, on the other hand, is one in which organisations take the safe road and retain a high level of current assets, which comprises a high level of current assets and a low level of current liabilities. But if compared between both of them aggressive approach is riskier as compared to conservative approach as seen in aggressive approach the investment in current asset is low as compared to corresponding level of current liabilities, and hence it will deteriorate the current ratio of the company and the working capital management too gets affected. Because of these approach over-capitalisations and overtrading of working capital can occur.

Over-capitalisation which could also be known as excessive working capital is the result of conservative approach where the current assets is too high and current liabilities are very few. Thereby, it will lead to excessive working capital.

Under-capitalisation, on the other hand is the opposite of over-capitalisation. In overtrading the level of working capital is low which means, that current assets are very few and current liabilities is high and this can create serious problem for the business as current liabilities is high this will be indicating that the company is unable to pay its' suppliers and is delaying them as they have very low level of cash or even an overdraft.

The technicalities involved in managing working capital of a firm can be summarised by calculating the cash operating cycle. So, basically cash operating cycle shows the days or period between the cash outflows being done by the company and the cash inflows from the sale of goods. In simple words if cash operating cycle has to be explained then it can be defined as number of days the company have to be without cash.

Cash Operating Cycle = Inventory Conversion Days +
Receivables Collection Days –
Payables Payment Days

But what is the significance of calculating the cash operating cycle? To answer that, it can be said that the cash operational cycle's primary relevance can be summed up as reflecting the firm's working capital investment as it progresses through the production process and toward sales. This length of cash operating cycle can be different for different firms. As seen of supermarket chain they might have a very low or negative cash operating cycle as they have low amount of inventory, receivables but high number of

payables but on the other hand if this cash operating cycle is being taken of the construction company, then it would be high for, they have large inventory large receivables that is the credit they give customers and low number of payables. So, this cash operating cycle is useful for summarising all the working capital management and its' calculations at one place.

In this regard, the purpose of this study is to discover the precise impact of working capital on profitability by adjusting the days of collection, payment, conversion to inventory sales, and finally the cash conversion cycle.

2. LITERATURE REVIEW

As analysed by syed (2015), numerous prior research has been carried out to gauge the connection between profitability and management of working capital. Using various ratios as an independent variable, the impact of management effectiveness and liquidity is assessed on the profitability of the chosen power industry. The storage efficiency, debtor turnover ratio and interest coverage all showed a significant impact.

Studies have also found a negative correlation between cash conversion cycles, inventory turnover and return on assets for business involved in trading industry and are listed on the Colombo Stock Exchange. In Singapore, Ebrahim (2012) examined the same image and discovered proof that effective working capital management enhances managerial performance. Their findings show that the firm's profitability has increased as a result of cutting the inventory conversion period and receivable collection period. In her research, Shardadevi found significant relationship between the length of time it takes a company to pay a customer and the cash conversion cycle, indicating that the company takes longer to pay. Due to its creditors, it is more profitable.

In another study, the purpose of a study was to determine how working capital management influences profitability (Khalid, Saif, Gondal, and Sarfraz, 2018). Additionally, the linearity and normality tests were applied. Overall, the outcomes were favourable. The T-test is used to determine whether or not each variable is significant and to determine the importance of individual variables.

Panigrahi (2013), in his study, shows a link between inventory management and profitability. Over a ten-year period from 2001 to 2010. Dr. Panigrahi emphasised the significance of inventory management techniques and their effect on working capital effectiveness in Indian cement industries. In this study, regression analysis is utilised. The findings show a significant negative linear association between profitability and the time it takes to convert inventory. Furthermore, it was shown that profitability rises when the financial debt ratio decreases. A link between profitability and firm size was also demonstrated, with profitability rising as firm size grew. Finally, profitability and the current ratio did not correlate well.

A case study of selected Istanbul stock exchange companies by Karaduman, Agan, Akbas, Ozsozgun and Durer (2010) demonstrated empirical evidence on how management of working capital affects liquidity and profitability. The study was conducted on 140 companies randomly selected from the listed companies of Istanbul Stock Exchange (ISE). The study was conducted for a period of 3 years, i.e., from 2005 to 2008. The return on

assets of the sample companies increases as the total days of accounts receivable, payable, and inventory are reduced. Furthermore, asset returns are higher because the cash conversion cycle is shorter. Furthermore, the results of control variables such as size have been considered.

3. RESEARCH METHODOLOGY

3.1 Research Objectives

Following are the primary objectives of the study:

- To analyze the relationship between management of working capital upon liquidity and profitability.
- Examine the impact of inventory holding time (inventory days), receivables collection time, payables payment time and cash operating cycle on liquidity and profitability.

Table 1: Variables Used in the Study

Variables	Formula	Abbreviation used
Inventory days	Inventory/Cost of goods sold *365	IHP
Receivables days	Trade Receivables/Credit sales*365	RCP
Payables days	Trade Payables/Cost of goods sold *365	PPP
Cash operating cycle	IHP+RCP-PPP	COC

3.2 Research Hypotheses

When it comes to making financial decisions, working capital is crucial. The requirement to keep working capital liquid throughout the day is an important aspect of managing it. Today's operation is to keep the firm running efficiently and to meet its obligations. As a result, one of the independent variables to be studied is working capital, i.e., how it affects the bottom line.

In this regard, following hypothesis has been framed:

- H_{0a}: There exist relationship between inventory holding time and profitability.
- H_{0b}: Relationship exists relationship between receivables collection period and profitability.
- H_{0c}: Relationship exists between payables payment period and profitability.
- H_{0d}: Relationship exists between working capital management and profitability.

3.3 Materials and Approaches

The selection of components for the current study was influenced by the earlier study of working capital's impact on management. In this study, there are some control,

dependent, and independent components. Both the gross profit ratio and return on assets serve as measures of profitability. In earlier studies, dependent variables like as operating profit and net income were used. The dependent variable, in this case profitability (measured in terms of net income), and liquidity, which is also closely related to working capital in the current study, are the ones that are changed during the experiment.

A dependent variable's dependent variable is an autonomous variable. In the prior study, autonomous variables included Receivables Collection Days, Working Capital Operating Cycle, Payables Payment Days, Stock Turnover Ratio, Current Ratio, Liquid Ratio, etc. Receivables Collection Days, Payables Payment Days, Stock Holding Period, and Working Capital Operating Cycle are independent variables for this study.

The study's goal is to use statistical analysis to determine the relationship between the variables.

The impact of working capital on profitability and liquidity was calculated using the equation below:

$$P(it)= IHP\ (i,t)+RCP\ (i,t)+PPP\ (i,t)+COC\ (i,t)$$

$$L(i,t)=I\ (i,t)+R\ (i,t)+C\ (i,t)-[P^*\ (i,t)+O/D\ (i,t)]$$

Where;

P= Profitability; i= 15 firms; t= 5 years; IHP= Inventory Holding Period; RCP= Receivables Collection Period; PPP= Payables Payment Period; COC= Cash Operating Cycle; L= Liquidity; I= Inventory balance; R= Receivables balance; C= Cash balance; P*= Payables balance and O/D= Overdraft balance.

Note: Either cash balance or overdraft balance will be present at one time not both at same time.

In the above equation, Profitability is reliant variable which is affected by the independent variable i.e., IHP, RCP, PPP, COC. Whereas, Liquidity is also a dependent variable which is affected by the autonomous variable i.e. I, R, C (Current assets (CA)), P, O/D (Current liabilities (CL)). Moreover, different liquidity ratios such as Current ratio and Quick (acid test) ratio has been calculated for measuring the liquidity of the firm.

3.4 Data and Sample Collection

The data comes from the S&P Capital IQ website. Cement firms, trading companies, manufacturing companies, pharmaceutical companies, and other companies were the subjects of the majority of research looking into the association between management of working capital and financial performance of firm.

In this respect, a sample of 15 trading organisations has been selected for the current study in order to determine whether there is any evidence of the impact of working capital management on profitability and liquidity. The information was gathered from 2015 to 2019 across a five-year span. The chosen businesses are all listed on the New York Stock Exchange (NYSE). As a result, the study's main objective is to ascertain how working capital management might assist these publicly traded companies in achieving

long-term success. The companies under study are all publicly traded. The companies selected for the study are:

1. **Applied Industrial Technologies Inc. (AIT):** is a public, multinational firm headquartered in the United States. The distribution of bearings, power transmission components, and other industrial supplies is its core focus.
2. **DXP Enterprises Inc.**: DXP Enterprises Inc., a publicly traded professional distribution management firm, sells and services to a wide range of industries.
3. **Walgreen Company**: After CVS Health, Walgreen Company is the second-largest drugstore store chain in the United States. Its main focus areas are prescription filling, health and wellness products, and so on.
4. **H&E Equipment Inc. (HEES)**: It is one of the nation's major equipment rental firms, offering the highest quality in equipment rentals, sales, parts, and services.
5. **EVI Industries Corp**. is a distributor of industrial boilers, parts, supplies, and technical services, as well as commercial laundry and dry-cleaning equipment.
6. **Kaman Corporation (KAMN)** is an American aerospace business that was founded in 1945 by Charles Kaman. It was previously a designer and producer of a number of helicopters.
7. **MSC Industrial Direct Co. Inc. (MSM)**: MSC Industrial Direct Co. Inc. (MSM) is one of the major industrial equipment distributors in the United States. It has sold over 1.5 million metalworking and other industrial items so far.
8. **Houston Wire and Cable Company (HWCC)**: A subsidiary of OmniCable, HWCC is one of the leading redistributors of electric wire and cable, as well as related services, in the US industrial distribution market.
9. **Hutting Building Products Inc. (HBP)**: This company distributes building materials which are mainly used in residential construction, home improvement and repair work.
10. **Gypsum Management and Supply Corp**.: It is a leading North-American based supplier of building materials since 1971. It offers metal frames, gypsum wallboard etc and many more essential building materials.
11. **XPO Logistics** is a U.S.-based freight transportation company that specialises in offering truck brokerage and less-than-truckload services to clients in 18 different nations.
12. **W.W. Grainger (GWW)**: It is one of the companies that is listed in American Fortune 500. Its' main area is in dealing industrial supply and to provide with access to a consistent supply of motors.
13. **Fastenal Company**: It is an American based company. It is also one of those companies which has been listed in Fortune 500. This company mainly sells screws threaded rods and nuts which are used in construction and manufacturing purposes.
14. **United Parcel Service (UPS)**: Founded in 1907, UPS is an American international shipping and receiving firm with a focus on supply chain management.

15. **Eco Shift Power Corp. (ECOP)** is a consultancy firm specialising in energy management. In North America and the Caribbean, it sells and distributes energy saving lighting equipment to commercial and industrial customers.

4. RESULTS AND DISCUSSION

Descriptive analysis, correlation matrix, and regression analysis were used to analyse the data.

The following observations are drawn from the table, which is based on data collected over a five-year period (2015-2019) and of 15 trading companies selected for the study.

TABLE 2: Financial and Working Capital Related Data of Selected Companies

Item	Average	Deviation from average	Lowest	Highest
Profit	2.453	3.245	-6.872	30.765
Liquidity Position	5.454	4.587	1.201	6.908
IHP	51.38	16.886	18.576	133.28
RCP	36.766	14.617	9.61	79.698
PPP	71.24	26.05	30.62	139.53
COC	85.85	36.63	18.024	193.18

It is evident from table 2 above that the liquidity and profitability lie between too low level to satisfactory level as these ratios of are of together 15 trading companies.

There are some companies taken which distributes house-building equipment's and for those companies IHP and RCP are high and PPP low which had affected the net profitability in the above case. There are dry-cleaning companies also that have been taken and of those companies IHP and RCP are low but PPP is high and COC of those companies will be low as compared to house-building equipment companies whose COC will be high.

Similarly, these house building companies if having high IHP and RCP then this means their CA will also be high and their PPP being low their CL will also be low and this means the current ratio of these companies would have been high. As compared, to dry-cleaning companies whose IHP and RCP is low so this means that their CA will also be low and their PPP is high so this means that their CL is also high which means the current ratio of these companies would also be low.

So, all these factors had led to the affect in the profitability and liquidity and on their dependent variables. But, overall, the result of these companies has to be explained in simple language then the liquidity and profitability of these companies seems to be satisfactory.

The inventory holding period has been lengthened. The maximum inventory holding period is of 139 days which is way too high holding period for inventory. Generally speaking, the shorter the inventory holding period, the better. Having such high inventory holding period can be prove expensive to the company for the company might be having

high amount of inventory and, as a result, a low inventory holding speak to good management. Different stock management systems and models like Economic Order Quantity (EOQ), Periodic reviews and Just-In-Time (JIT) can be adopted for the better management of the inventory thereby, reducing the risk of theft, damage and obsolete and total and purchase cost of inventory and thereby, reducing the working capital investment in inventory.

In light of the inventory holding duration of 139 days, the present ratio appears to be less hopeful. Inventory that takes over four months to sell isn't exactly liquid.

The receivables collection period maximum is of 133 days which shows that the company is taking very long period to recover its' money from its' customers and is giving much credit to its' customers. This shows the company's view to improve profitability. It's critical to create the company's credit policy. Due to the company's large receivables credit limit to consumers, the current ratio has been low because it takes the company a long time to collect money from customers, resulting in low current assets and high current liabilities.

This circumstance necessitates a re-evaluation of the liquidity ratios. The quick ratio ignores inventories but assumes liquid receivables. If debt collection is an issue, receivables are illiquid, and the company could struggle to pay existing liabilities if all of them came due at once. This will increase the risk and cost of bad debts for the company. In order to avoid such mis happenings, the company can adopt the particular techniques to chase the overdue amounts:

- Reminder letters: These are sometimes viewed as a poor method of collecting money because many clients simply disregard them. Reminders sent via email are frequently more effective than those sent via mail.
- Telephone calls: they are more expensive than reminder letters (which can be generated automatically by most accounting systems), but they can be an effective way of speeding up payment when significant quantities are involved.
- Withholding supplies: putting clients on a "no-order" list for future orders or spare parts can push debtors to pay up quickly.
- Debt collection firms and trade associations: these companies provide debt collection services for a set fee or on a "no collection, no fee" basis. The level of service given varies greatly, therefore choosing one should be done with caution.
- Taking legal action: this is frequently viewed as a last resort. Payment is frequently prompted by a solicitor's letter, and many cases do not proceed to court. Although going to court is usually not cost-effective, it can deter other customers from delaying payment.
- The payables payment period is maximum up to 80 days and lowest to 9 days. Such low payables payment period seems to be very unusual. This shows that the company is paying to its' suppliers in just 9 days.

While having a high number of payable days, such as 80 days, which is close to three months, may be beneficial in that it indicates all available credit is being used, there are six potential drawbacks to obtaining extended credit:

- Future suppliers could be jeopardised.
- The cash discount for quick payment is no longer available.
- Knowing that the company accepts extended credit, suppliers may offer a higher price for items.
- Suppliers may reject doing credit supplies to the company and may only accept cash supply of goods.
- Even more dangerous can be, that the suppliers stop providing goods to the company.
- Losing supplier goodwill.

Additionally, if the working capital ratios are seen, then these high payables payment period might suggest that the company due to cash flow issues, vendors are going underpaid.

Cash operating cycle is also very high to 193 days. This is Between paying cash to vendors for items and collecting cash back from customers, there is about a 193-day lag. Other words, it means that the company has to live 193 days without cash. This long cash operating cycle is giving one of the reasons to believe in the delay of payments to the suppliers.

4.1 Correlation Analysis

The degree of relationship between the variables under examination is measured using correlation analysis. The following Table shows the correlation matrix of all variables involved in the investigation, which was constructed using data from 15 trading companies over a five-year period from 2015 to 2019.

A Pearson's coefficient of correlation study was used to try to figure out the relationship between profitability, liquidity, and working capital.

TABLE 3: Result of Correlation Analysis

	NP	RCP	PPP	IHP	COC
P	1				
RCP	-0.353391495	1			
PPP	0.127879206	0.25544055	1		
IHP	0.225071917	0.20822956	-0.140703	1	
COC	-0.271955653	0.50715839	-0.381359	0.8633495	1

As shown in table 3 above, there is a negative relationship between profitability and receivables collection period; the shorter the receivables collecting period, the better the profitability.

This shows and that is obvious that the receivables and liquidity has positive relationship. As the lower receivables collection period will lead to higher profitability but lower liquidity. Whereas, on the other hand higher receivables collection period will lead to lower profitability but higher liquidity. As, receivables is a part of current assets so in

simple words it can be said that receivables increase; liquidity increase but profitability decrease.

The correlation between payables payment duration and profitability is 0.127, indicating that there is a positive association between payment period and profitability. As we know that payables are a part of current liabilities so as current liabilities will increase the liquidity ratio will automatically reduce thereby reducing the liquidity of the organisation but increasing the profits.

There is a negative connection between profitability and the cash operating cycle of 0.271, indicating that a longer receivables collection period leads to a longer cash operating cycle, and vice versa, affecting profitability.

Cash is most liquid asset and is generally accepted as a medium of exchange. Cash is a part of current assets and it is obvious that as the cash increases the liquidity of the organisation will improve and this will have an inverse effect on profitability and vice-versa.

The relationship between inventory holding period and profitability is positive, which is above and beyond what was expected. This is because, as inventory holding period increases the working capital cycle will also increase as cash operating series will increase this will have a negative effect on the cash balance in the current assets. Because, as mentioned above cash operating cycle shows the number of days the firm will have to live without cash and as inventory holding period will increase the cash operating cycle will automatically increase and the firm will have to live with those extra days without cash. Thereby, having negative impact on liquidity and positive effect on profitability and vice-versa.

The cash conversion cycle and the payables payment time have a negative relationship. The same reason as mentioned above that the payables payment period decreases the cash operating cycle will increase having negative affect on cash balance and positive impact on profitability and vice-versa.

The inventory holding duration and receivables collection period have a favourable link with the cash operating cycle but negative relation of payables payment period with cash operating cycle. This can also be argued that since inventory, receivables and cash are current assets so they will have positive relationship. Payables being a part of current liabilities have a negative relationship with the cash operating cycle and vice-versa for profitability.

It also depends on whether the primary goal of working capital management is profitability or liquidity. When cash management has grown excessively conservative, profitability may become a more essential goal.

If the company is adopting the profitability as its' primary financial objective then the company is adopting aggressive working capital funding approach as in aggressive working capital funding approach the company finance most of the current assets with the short-term finance is though it is hazardous, it has lower finance costs, resulting in higher profits.

But, on the other hand if company is adopting liquidity as its' primary objective then the firm is adopting either conservative or matching working capital funding approach. In

conservative working capital funding approach, most of the liquid assets are financed with extended - period investment. Long-term finances are expensive but are stable too. In the matching working capital funding model, on the other hand, the length of the loan is matched to the length of the investment.
If company wants to maximise profitability, then it should the particular order of working capital funding approach:

- Aggressive approach.
- Then, conservative approach.
- Last, matching approach.

If the company wants to maximise liquidity, then it should the particular order of working capital funding approach:

- Matching approach.
- Then, conservative approach.
- Last, aggressive approach.

The final decision on working capital funding, in particular, is left to the discretion of individual company management:

- The organization's size
- Their creditors' readiness to lend
- The hazards in their business sector.
- Previous funding decisions (past experience will improve the manager's ability to anticipate the effect of working capital fluctuations and proactively make decisions to curtail the negative impact of such fluctuations).

4.2 Regression Analysis

TABLE 4: Result of Regression Analysis

Regression data	Values
Diverse R	0.634
R fair	0.584
Accustomed R fair	0.342
Normal slip	0.432
Remarks	80

The R-squared in the model is 0.584, or 58.4 percent of the variation in the dependent variables, profitability and liquidity (refer to Table 4). This shows the profitability and liquidity ratios has major impact on the organisation working capital model that was 58%. The nature of the business, the climate in which it works, and other important factors all have an impact on working capital.
Therefore, it can be clearly stated that a firm's working capital model is affected both profitability and liquidity ratios and other major factors therefore, a right balance should be strike between for the good management of working capital.

5. CONCLUSION

The study discovered a relationship between profitability and liquidity as well as a number of working capital management factors, such as the time it takes to collect receivables, the length of time inventory is held in stock, the time it takes to pay for payables, and the cash operating cycle.

The data demonstrated an inverse link between profitability and average receivables collection period, with profitability increasing as average collection duration decreased. Nonetheless, there is a positive link between liquidity and the time it takes to collect receivables: the longer it takes to collect receivables, the higher the liquidity (i.e., current assets), and the shorter it takes to collect receivables, the lower the liquidity.

The correlation between payables days and efficiency is 0.127, indicating that an increase in payables payment period results in an increase in profitability, but payables payment period increase lead to reduction in liquidity (i.e., current ratio and quick ratio) because if payables payment period increases payables amount also increases which in turn lead to increase in current liabilities and therefore liquidity ratio deteriorates.

It has been discovered that when the cash conversion cycle shortens, the firm's profitability rises, because cash is highly liquid asset and cash i.e., liquidity and profitability have different objectives, if liquidity i.e., cash increases profitability reduces and if liquidity i.e. cash decreases profitability increases. Therefore, as mentioned above a right balance between them is very must. Managers can concentrate on increasing shareholder wealth, indicating that it has been maintained.

The study's findings reveal a considerable relationship between working capital and organisational profitability. The greater the current assets, the greater the working capital, and the greater the working capital, the greater the liquidity or profitability. On the other side, as current liabilities increase, working capital decreases, indicating that current assets will decrease but profitability will remain constant. This demonstrates the close link between working capital, profitability, and liquidity.

It suggests that if financial managers keep a close eye on liquidity, profits will follow. As a result, it is advised that businesses establish a robust receivables collection policy because a good receivables policy will lead to better liquidity as the firm will be able to receive cash quickly from customers and this in turn will improve the liquidity and a good receivables collection policy will also mean that the credit sales is being offered to the customers too which in turn will increase the revenue too and as revenue increases the profitability will also increase.

Additionally, it is asserted that managers may increase shareholder wealth by shortening the time required to collect receivables, lengthening the time required to pay payables, and minimising inventory. This in turn will show that the firm is preserving the cash and is focusing on improving its' cash balance but as mentioned earlier the firm should not delay the payables payment period to that extent which in turn will lead to worsening of supplier's and firm's relationship.

As a result, it is correct to say that working capital management is the factor that determines whether a company's strategy succeeds or fails based on its working capital

management. Working capital management is, has been, and will continue to be the most critical aspect in a company's long-term performance.

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