

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF COMMERCE**



**AN ANALYSIS OF THE EFFECTIVENESS OF WORKING CAPITAL  
MANAGEMENT IN GAS INDUSTRIES. A CASE STUDY OF BOC  
GASES.**

**SUBMITTED BY**

**FELIX TANAKA GOMWE**

**B1850837**

**A RESEACH PROJECT SUBMITTED TO BINDURA UNIVERSITY OF SCIENCE  
EDUCATION IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF  
BACHELOR OF ACCOUNTANCY HONOURS DEGREE.**

**JUNE 2022**

## Approval

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I, certify that this dissertation meets the preparation guidelines as presented in the Faculty Guide and

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III. To be completed by the Chair of the Department:

I certify, to the best of my knowledge, that the required procedures have been followed and the

Preparation criteria have been met for this dissertation.

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**Release Form**

**NAME OF AUTHOR: B1850837**

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## **Abstract**

This research aims to investigate and analyse the effects of working capital management on companies in the gas industry precisely focusing on BOC Gases as a case study. The research further goes to analyse effects of current COVID-19 pandemic on working capital management policies and the hyperinflationary environment gas companies are operating in. The results show that gas companies adopted a moderate-conservative strategy for their working capital management. Furthermore, the evidence confirms that COVID-19 pandemic crisis did not change Working Capital Management strategies significantly but raised cash inflows instead. Companies like BOC Gases that have high financial security as a result of the higher liquidity ratio, quick and (CCC) have tried to lure more customers by increasing the trade receivables due date in order to improve sales performance and also lower the liabilities turnover to work with more suppliers. However, due to inflation BOC Gases has been more generously granting more trade credit to clients buying in foreign currency because our local currency is quickly getting eroded.

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# Chapter 1

## 1.1 Introduction

Cash is the life blood of a business, no matter how much profit an industry makes it can only spend cash and not profit. Working capital is business cash that is needed for day to day operations and working capital management refers to the control of short term possessions and short term liabilities, so as to reduce the risk of bankruptcy and increase the return on assets (Salehi et al, 2019). Components of short term assets include inventories, loans and advances, debtors, short term investments and cash balances. Short term liabilities include creditors, trade advances, borrowings and provisions. Due to the high inflationary environment, a gas company needs to maintain an optimum level of debtors, creditors and cash to maintain its financial strength. The recent COVID-19 pandemic needed effective management of working to able to withstand continuity in gas companies.

Management of working capital seeks to ensure that a company can continue operating and has the resources necessary to pay off both current debt and anticipated operational expenses. At a broader note, liquidity is closely related to the concept of working capital but they differ (Tandoh, 2020). A business keeping high level of inventories and accounts receivables seems viable but creditors do not take inventories and accounts receivables as payment. Cash is needed primarily to support the day-to-day financial operations of an organization; this involves the procurement of raw materials, the payment of salaries, wages, telephone bills and other business expenses, and the financing of credit sales.

## 1.2 Background and justification of the study

Just as circulation of blood is crucial in the human body for maintaining life, so is working capital for the smooth running of business. Many organisations that are profitable on paper are forced to cease trading due to an inability to meet short-term debts when they fall due. A business may be quite viable, yet it still has the potential to fail if it lacks the cash or liquidity necessary to pay its essential bills. The press is constantly reporting of companies that shutting down as a result of liquidity and insolvency problems as a result of poor working capital management.

This study on working capital management has been an effort to increase returns on capital, deliver enough cash flow to cover investments and dividends. This will strengthen the balance

sheet to prevent a lower credit rating. Due to the high inflation rates, the cost of holding cash is largely increasing and credit sales are coming at a very huge expense. In order to remain in business it is essential that an organisation successfully manages its working capital. Too often however, this is an area which is neglected by the management thus the company will unexpectedly face liquidity problems, gas and fuel prices have become very volatile and companies in this sector should be very cautious in their capital allocation strategies (Ebben and Johnson, 2011). The research therefore will attempt to encourage management to effectively manage its working capital and highlight the advantages and disadvantages of it with much emphasis on how it can help reduce insolvency and should maintain very conservative price outlooks that should insulate planning from recent price shifts.

It is very crucial to manage the company's working capital as cash generated from the working capital cycle differs with profit generated from the business. Without adequate cash/liquidity, profitable companies cannot survive as they need to pay their liabilities from cash and not from profit. Working capital is of great importance to small companies trying to achieve market penetration (Dankiewicz and Zimon, 2020).

The research mainly focuses on gas companies in the gas and fuel industries. Companies in the gas industries provide vital products that play a pivotal role in the economy, these products range from medical oxygen, industrial CO<sub>2</sub>, liquid nitrogen, army jets high flying nitrogen and cooking gas which has become a cheap and clean source of energy. Therefore, the study of working capital management will help them to withstand the heat in this high inflationary environment and cater for the unexpected price increases and reductions. The continuity of gas companies is of great importance to consumers and the nation at large.

### **1.3 About BOC gases.**

BOC Zimbabwe, trading as BOC GASES is Zimbabwe's market leader in gases and welding products and has operated in Zimbabwe since 1927, operating 5 branches. BOC is wholly owned by the Linde group, one of the world's leading gases companies, with its headquarters domiciled in Munich, Germany. BOC Zimbabwe's Air Separation Unit in Harare has 120 employees, and operates through its distribution network of 5 branches in the major industrial cities of Harare, Bulawayo, Gweru, Mutare and Kwekwe and other several Distributors and Agencies. BOC is regionally supported by Linde Group sister companies in 17 African countries with AFROX in South Africa as the regional Head Office. This significant geographic presence throughout Africa is important in that it gives supply and service guarantee

based on the synergies created by intercompany support between the different countries. BOC Zimbabwe has 3 main business streams:

- Packaged gases and products
- Bulk gases
- Hard goods ( welding equipment, Accessories and consumables)

BOC gases has invested considerably in resources to support these three business portfolios. The investment covers Air Separation Unit plants; Pressure Swing Adsorption plants, Cylinders, road tankers, Trailers and Trucks. This investment is BOC GASES' commitment to sustain its superior customer service in as much as it is a commitment to grow the Gases and Welding business in the markets we operate. Production of Dissolved Acetylene, Oxygen, Nitrogen and Argon is done in Harare whilst production of Vitemax, a general purpose is done in Gweru. Liquefied Petroleum Gas, Carbon Dioxide, Specialty are purchased from our sister company, AFROX, in South Africa.

#### **1.4 The research problem**

Working capital and liquidity problems have negatively hit BOC GASES; the company is failing to receive payments from debtors in time and is continuously writing off bad debts. As a result, BOC GASES is failing to settle its short term obligations and maintain operating expenses such as truck tolling fees, weekly wages, telephone bills and electricity needed to run the plant. This eventually jeopardises the quality of medical oxygen and service delivery to all consumers. The failures are directly attributed to management failing to maintain the optimum level of major components of working capital such as inventory, debtors, creditors and cash to quench the liquidity crunch especially in a high inflationary environment. It is at this level that this study seeks to analyse the importance of working capital management in a gas company to resolve all the highlighted problems.

#### **1.5 Objectives of the study**

The following objectives will be accomplished through the use of secondary data made up of information from information-forecast publications and relevant entity journals, as well as primary data that entails the use of questions and in-depth interviews.

- ❖ To assess the goals of managing working capital and the degree to which these goals are being met at BOC GASES.
- ❖ To explain the notion of liquidity and bankruptcy.

- ❖ To outline the difficulties gas businesses are having managing their working capital and suggest some potential solutions.
- ❖ To determine the viability of various model strategies for working capital management and the effect they have on the overall performance of gas manufacturing and retail enterprises.
- ❖ To investigate the impact of hyperinflation on the management of working capital policies.
- ❖ To determine the effects of the Covid-19 pandemic on working capital of Gas Companies.

## **1.6 The research question**

To what extent can good working capital management improve the operations, increase firm value and insulate a company from inflation.

### **1.6.1 Sub questions**

- What are the problems encountered by company in trying to effectively manage its working capital and how can these problem be minimized?
- How can working capital management reduce insolvency in gas industries?
- What are the effects of poor working capital management?
- What are the problems encountered by company in trying to effectively manage its working capital and how can these problem be minimized?
- What policies can be employed in gas manufacturing companies to effectively manage its working capital in high inflationary economies?
- What strategies can be put in place to ease the problem of working during the Covid19 pandemic?

## **1.7 Significance of the study**

### **1.7.1 To the researcher**

The research project is carried out in partial fulfilment of the requirements for the Bachelor of Accountancy Honours Degree at Bindura University of Science Education. This research will give the researcher an opportunity to integrate the theoretical practice gained in class and practical hands on experience. An in depth understanding and appreciation of the concept working capital management will be gained by the researcher practically.

### **1.7.2 To the university**

The information from this study may help other academics by serving as a resource on effective capital management and its significance in reducing insolvency in the economy while also offering a course of thought to successful students. The recommendation's success will be identity and give future endeavors more confidence.

### **1.7.3 To the organizations**

Organisations in the gas manufacturing and retail industry can incorporate some of the issues highlighted in the research to aid in their operations and benefit. The issue of working capital management applies to all industries be it big or small and private or public companies, all can learn the major components of working capital management. Depending on the nature of the industry, firms can insulate against the high inflation rate pandemic hitting our country by maintaining optimum working capital.

### **1.8 Assumptions**

- That the information obtained by the researcher is free from bias and window dressing.
- That the sample selected is representative of the whole population
- That all the respondents will respond in time with true and accurate data.

### **1.9 Limitations**

The research will be carried out under the following drawbacks:

- The researcher is limited by financial constrictions to explore all areas of study.
- The researcher is limited due to the COVID-19 pandemic restrictions.
- The researcher is limited by the time frame within which this project has to be conducted and presented.
- respondents may be unwilling to cooperate or respond due to work pressure or confidentiality reasons.
- Some information desired might not be released as such information may be deemed highly confidential to the company

### **1.10 Research challenges**

- reporting using different multicurrency reduces consistency in report figures.
- Internet and network problems.



## Chapter 2

### Literature review

This chapter is a review of working capital literature written by other scholars. The researcher appreciates what other authors, previous publications, journals and websites educate about working capital management globally and locally. In order to get an in-depth understanding of the effectiveness of working capital in gas and other key industries, it is necessary to incorporate what other researchers have found during their researches.

#### 2.1 The need for working capital

For continuity and profit making, BOC Gases has to invest funds in to current assets so as to generate sales. In most cases goods sold do not instantly realise into cash, therefore, sufficient working capital provides back up to sustain operations and sales activity. Tandoh (2020) is of the cash is needed to finance labour and production overheads needed to convert WIP into finished goods. Finished goods will convert to sales in the form of sundry debtors and which will in turn convert to cash after agreed credit period. WIP and sundry debtors hold cash in the operating cycle; therefore sufficient working capital management is needed to backup operations. Liabilities also aid in maintaining liquidity and the amount required to be invested in these current assets is always higher than the funds available from current liabilities. This is the most important reason for the need for working capital (Oseifuah, 2018).

#### 2.2 What is working capital?

Working capital is the necessary funding needed to pay short term debts, cover day to day operations and finance current assets. It ensures that a company operates efficiently by monitoring and using its current assets and liabilities to their most effective use.

Working capital is the amount by which current assets exceed current liabilities. It should be kept at a satisfactory level and optimum mix of current assets and current liabilities. Appropriate sources of funds are working capital funding should be used and short term obligations satisfied in time.

According to James S. Signer-“Surplus of current assets over short term current obligations”.

According to Bhalla V.K-“The vitality of the company is required for day-to-day operations, and excess capital assets (cash, accounts receivables, inventories) outweigh excess capital

liabilities (amounts owing to employees and others, such as salaries and wages payable, accounts payable, and taxes owed to the government).

## **2.2.1 There are two concepts of working capital management**

### ***2.2.1.1 Gross working capital***

Is the sum of all current assets of company at a given point in time easily convertible to cash within a period of one year. It includes accounts receivable, cash and bank balances, short marketable securities and inventory of WIP and finished goods.

### ***2.2.1.2 Net working capital***

Net working capital is the aggregate amount of all current assets and current liabilities. It is a measure of the short term liquidity of a business and can also be used to obtain a general impression of the ability of company management to utilize assets in an efficient manner. It is the net of current assets minus current accounts payable.

## **2.3 Business liquidity versus business solvency**

Liquidity is defined as a company's capacity to pay its debts as they become due and the speed at which an asset can be converted into cash at a moment's notice. Baveld (2012) explains that it is an entity's strength to pay its liabilities on time, current assets and large amounts of cash are reflectors of high liquidity.

Solvency refers to the business long term financial position, meaning the business has positive net worth. Basically it is a financial situation in which total assets exceed total liabilities by a significant amount, which paints a positive picture about the going concern status of an entity.

Solvency risk is the risk that the business cannot meet its financial obligations as they come due for full value even after disposal of its assets. A business that is completely insolvent is unable to pay its debts and will be forced into bankruptcy (Dalci and ozyapici, 2018).

## **2.4 Management of working capital various techniques.**

### **2.4.1 Levels:**

- a) Ratio analysis aids in identification of poor performing areas which need closer management attention in the management of a firm's cash, inventory and accounts receivables.
- b) All aspects of working capital can be analyzed and managed individually using various techniques.

## **2.5 Relevance and applicability of working capital ratios.**

ratio analysis helps to identify the performance of a company in terms of profitability, liquidity and efficiency either individually or in relation to other similar companies. It uses immediate past ratio and historical market data to help forecast the future(Hu and Schwarz, 2011).

### **2.5.1 EFFICIENCY RATIOS**

Efficiency ratios measure a company's ability to use its assets to generate internally.

#### ***2.5.1.1 Working capital turnover ratio***

Working capital turnover ratio is a ratio that measures how efficiently a company is using its working capital to support sales and company growth. It is also referred to as net sales to working capital and shows the relationship between the funds used to finance a company's operations and the revenues a company generates to continue operations and turn profit.

Net Annual Sales

---

Average working capital

A high turnover ratio generally portrays that management is efficiently using short term assets and liabilities to support sales.

#### ***2.5.1.2 Inventory turnover ratio***

Inventory turnover ratio depicts how efficient the firm is in producing and selling its products. It is the rate at which inventory stock is sold, used and replaced in a given time period. The formula is:

Cost of goods sold

---

Average inventory

This helps a gas company to make better decisions on pricing, manufacturing, marketing and purchasing new inventory. A high inventory turnover ratio implies two things either strong sales or insufficient inventory quickly being depleted. Whereas, a lower turnover implies weak sales or excess inventory. In a gas company such as BOC in context, a lower inventory turnover is not so bad particularly due to inflation when prices are expected to rise and gas products do not decay.

#### ***2.5.1.3 receivable turnover ratio***

Gross sales

---

### Average account receivables

Gross sales are inclusive of excise duty and scrap sales because both may enter in to receivables by credit sales. It takes you on average x days to collect monies due to you. If your official credit terms are 45 day and it takes you 65 days then you'll have to analyse why that is so. One or more large or slow debts can drag out the average days. Effective debtor management will minimize the days.

#### **2.5.1.4 Current assets turnover ratio**

This measures the efficiency of a company's ability to use current assets to generate revenue in its operations. A higher current assets turnover indicates efficient use of current assets in generating revenue or sales and on the other hand a lower ratio indicates a problem with one or more current assets. Obsolete inventory or a lower sales drive by management and sales persons.

$$\frac{\text{Total Annual Sales}}{\text{Total Current assets}}$$

#### **2.5.2 Liquidity ratios**

These are ratios used mainly by prospective creditors and lenders to assess the ability of a company to pay off its short-term debts by looking at liquid assets.

##### **2.5.2.1 Current ratio**

This ratio compares current assets to current liabilities to see if they are sufficient current assets to cover short term liabilities. It is just a picture of how current assets would pay current liabilities if they were liquidated and its major flaw is the inclusion of inventory which cannot be liquidated over night. A greater ratio is more desirable as it shows current assets are able to cover liabilities.

$$\frac{\text{Total Current assets}}{\text{Total Current liabilities}}$$

A ratio of 2:1 between assets and liabilities is typically seen as appropriate. The client ratio reveals a company's market liquidity and capacity to satisfy customers. Acceptable customer settings vary by industry. A corporation is generally thought to have solid short-term financial strength if its client assets are in this range.

Low values for the customer of fast ratios (values less than 1) suggest that a company would struggle to meet its debt obligations. Low values, however, do not necessarily point to a political issue. In order to fulfill its contractual responsibilities, an organization may be able to borrow against its strong long-term prospects. Some business kinds typically operate with a client ratio of less than one.

Holding other things constant, a creditor, who is expecting to be paid in the next 12 months, would consider a high current ratio to be better than a low current ratio, because a high current ratio means that the company is more likely to meet its liabilities which fall due in the next 12 months.

**2.5.2.2 The Quick ratio**

This depicts the company’s strength to meet its current obligations with its most liquid assets and therefore subtracts inventory from current assets. It is more oftenly referred to as the acid test ratio.

$$\frac{\text{Current asset} - \text{Inventory}}{\text{Current liabilities}}$$

Quick ratio portray that a company has sufficient high liquid assets for the payment of current liabilities. An acid test ratio of 1:1 is standard and ideal but a ratio of more than 1:1 is more ideal over the period of time.

**2.5.2.3 Absolute liquid ratio**

Debtors and bills receivables are considered as more liquid then inventories, but they cannot be liquidated to cash immediatly or in time. Absolute liquid assets take into account cash in hand, cash at bank and marketable securities (Zimon, 2020). The most desirable and optimum value for this ratio should be **1:2**. It indicates that 50% liquid can cover in full current liabilities. An absolute liquid ratio below **1:2** indicates poor cash management. Absolute liquid assets

$$\frac{\text{Absolute liquid assets}}{\text{Current liabilities}}$$

**2.6 Working capital cycle**

Basically Working capital is the period of time it takes a business to convert net working capital, like current assets and liabilities into cash. A long cycle frankly indicates that capital is being tie up for longer periods of time without generating a return. Short cycles mean you are able to free up cash faster with a quicker return turnaround time (Chang et al. 2020).

Working capital cycle focuses on four key elements and a gas company needs to have control over these components.

1. Debtors
2. Creditors
3. Stock
4. Cash and bank balances

WCC formula= inventory turnover days + debtors turnover days – creditors turnover

## **2.7 Working capital components**

### **2.7.1 receivables management**

This generally refers to the planning and controlling of debt owed by customers on account of a good or service provided on credit terms. Accounts receivable are outstanding invoices or monies which are still yet to be paid by a company' customers. Liquid cash is needed all the time for the smooth running of operations in a gas company, thus it is of vital importance to collect trade receivables on time. Credit policies, payment plans, sending payment followups and timely collection of debts are of vital pivotal importance in controlling accounts receivables.

Management of receivables is a tedious task in a large company like BOC Gases that is the sole provider of medical and industrial gases in the whole country. Public entities such as hospitals procure medical oxygen on credit terms and taking into account inflation this is not viable for a gas company.

### **2.7.2 Company Credit Management**

Trade credit is done on agreement that a customer can purchase goods or services and pay at a later date. This is an effective tool to encourage sales and stimulate business growth but this exposes a business to the risk of late payment or bad debts which disrupts the cash flow position of an entity. Determining a customer's credit worthiness before giving out credit is of paramount importance to insulate a company against financial risk.

### **2.7.3 Determining Credit Worthiness**

Credit worthiness refers to the ability of a customer to pay a company before giving out credit. To safeguard a business from late or non-payment on invoices, it is important to use the correct procedures and tools to thoroughly check the credit worthiness of a customer before extending credit. Ways to check to check foe credit worthiness of a customer:

- **Assess a company's financial health data.** request and go through a customer's audited financial performance from prior periods.
- **review a Business credit score by running a Credit report.** Use online platforms such as Fincheck to get credit rating report for a customer. This report details a business's ability to make payment based on past history and public records.
- **Ask for references.** This involves getting in touch with the customer's bank as well as business's or suppliers that are already giving credit to the subject.
- **Calculate the Customer's Debt-to-equity ratio.**Get to know which portion of a customer's debts make up its earnings. Divide the customer's monthly debt payments by gross monthly income, a lower ratio is advisable.

#### **2.7.4 Credit Sale terms**

Credit sales area accompanies by credit terms. These show when payment is due for credit sales, possible discounts, applicable interest rates and late payment of fees. A credit sale maybe 3/10, net 30 meaning that the credit period is 30 days, However if a customer pays within 10, a 3% discount will be given.

A cash discount is an incentive given to the customer by the buyer for paying an invoiced bill before the due date. This encourages debtors to pay their outstanding amounts on time, reduce the working capital cycle as cash will be received earlier due to reduced length of time and boost up in sales as customer will be attracted by the cash discount. On the other hand, cash discounts lead to a reduction in profits. An effective annual rate is the annualised implied cost of forgoing the discount, calculated by using the following formula:

Discount %            X            365

Effective rate =  $1 - \text{Discount \%} \left( \frac{365}{\text{Credit period} - \text{discount period}} \right)$

The goal of debtors' management is to ensure that all transactions result in timely cash flows. If the amounts owed to a party are reduced, cash inflows can be increased.

#### **2.7.5 Debt management and collections system**

##### **2.7.5.1 Collection policy**

Debt collection is an essential ingredient of effective cash flow management for company's offering trade credit.

After giving credit it becomes of paramount importance to make sure payment is received on time, according to agreed dates. Below are the most popular ways of debt following procedures

- Implement a reminder service- continuously reminding your customers before payment falls due maybe helpful in getting payment earlier.
- Offering a range of payment methods- give room for flexibility on payment methods, entity's operate differently and therefore it is necessary to allow customers to pay using electronically, cash, bank transfers, zipit and many more.
- Contact the right person- This applies most importantly to large organisation with a higher chain of command. The person who processes payments maybe different from the person who authorises them, therefore it is necessary to be in contact with the right person.
- Personal site visits- this is more common and useful, visiting the customer leads to more understanding and good customer relations as the outcome is produced quickly on site.
- Outsource debt collection- engage debt collection agencies if customers are not responding to your notices, they will collect the debts on your behalf but the methods used by them might damage relationships with customers.
- Legal action-if a solution can be not reached between the two parties, legal action becomes an option. This option is advisable if the amount involved is significant becomes it has costs attached to it such legal fees and the customer might declare bankruptcy without resolution.
- Declare bad debtor- if the customer cannot be traced or found, declare them as bad debts and write them off if necessary.

### **2.7.6 Debt Factoring**

This is a short term working capital financing method in which a company sells its outstanding invoices to a third party at discounted price so to as avoid the heft waiting times associated with invoice payments. This helps temporarily in improving cash flow and saves time but on the other hand leads to a reduction in profits by selling prices at a discounted price.

### **2.8 Management of inventory items.**

Inventory is a current asset item which can be divided into the following:



- raw Materials
- Work-in-progress
- Finished goods
- Materials and supplies

From a financial point of view, inventory is defined as the sum total of raw materials and supplies, including spares, semi-processed material or work in progress and finished products. Inventory is a significant part of current assets and forms an integral component of working capital management. It's a process which begins with inventory control and involves the timely purchase, proper storage and efficient utilisation to maintain an even and orderly flow of finished goods to meet timely commitment by the business. This process avoids excess working capital in holding of inventory as that will result in a delay in cash conversion cycle and eliminate the risk of obsolescence.

### **2.8.1 Objectives of inventory management**

- To have stock available as and when they are required so as to keep the customer happy and maintain good relations with him.
- To make use of storage space while preventing stock levels from going beyond the limit of the space.
- To keep inventories' assets properly accountable.
- To distribute, item by item, for each end point and each amount necessary to ensure that the overall result is consistent with the intent and goal of inventory control.
- To keep low investment in inventories carrying cost an obsolesce losses to the minimum.

Finding the ideal amount of inventory while minimizing inventory expenditures is the goal of inventory management. Inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods.

The definition of inventory management includes the subtle distinctions between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and malfunctioning goods and demand forecasting. In order to maintain optimal inventory levels, these opposing necessities must be balanced. This process is on-going

as the business needs change and respond to the wider environment. Inventory management entails a retailer trying to acquire and maintain a stock of merchandise while keeping overhead expenditures like warehousing, shipping, and handling in mind. Systems and processes that pinpoint actual and projected inventory status, create goals, provide replenishment approaches, and identify inventory equipment. Takes care of all tasks related to the handling and management of material (Tandoh, 2020). This would involve the keeping track of products that are moved into and out of stockroom locations as well as balancing the inventory. ABC analysis, lot tracking, cycle counting support etc, are possible additions. Managing of inventories, with the primary goal of determining/controlling levels of stock inside the geographical distribution function in order to strike an equilibrium between the demand for product availability and the need to reduce overstocking and handling expenses. The foundation of quantitative decision models is inventory costs, which are often split into designing costs and carrying costs.

- Ordering costs – The total fixed costs that are incurred each time an item is ordered make up this amount. They are related to the amount of consumed calories but primarily to the physical activity needed to process those calories. They are sometimes referred to as stock acquisition charges. The primary elements are:
  - Costs related to purchasing, accounting, and items received depatriations that are legal and administrative in nature;
  - • The setup and tooling expenses related to each production step when goods are internally manufactured.
- Delivery and handling fees
- Goods insurance in Transit
- Any fees that must be paid in the event of an audit

**Carrying costs** : The expense of keeping inventory on hand is referred to as carrying costs or holding costs. It mostly consists of investment-related costs and storage costs. The primary elements of it are:

- Interest on capital invested in the stocks;
- Storage charges (rent, lighting, heating, refrigeration, air-conditioning and others);
- Warehouse manpower, equipment maintenance and running costs;

- Handling costs;
- Audit, stocktaking or perpetual inventory costs;
- Insurance, security and others;
- Deterioration and obsolescence and
- Pilferage, vermin damage and others

### **2.8.2 Inventory management strategies**

The reduction of both manufacturing and shipping costs is the aim of inventory management. The more orders are placed, the higher the order-processing costs are while the caging costs are lower, suggesting that these costs are inversely related to the quantity of orders placed.

Therefore, it is crucial to position an optimization that reduces both optimization and carrying costs at a point when the two costs are reduced. This aids in determining the maximum stock holding level at which stock out costs are kept to a minimum.

The amount of inventory you should keep on hand to ensure supply continuity in the case of an uncharacteristic decrease in demand or lead time must be known in order to manage your inventory properly. The term "safety stock" refers to this amount of inventory. Although there isn't a universally accepted formula for determining safety stock quantity, Puch Tips offers a "risk averse" approach.

Secondly, you must know when to reorder materials for inventory. typically, this moment is determined when the amount of materials in stock declines to a specific level, or the reorder point."

$$rP = SSQ + (QUDX ALT)$$

Where

SSQ stands for Safety Stock Quantity

QUD stands for Quantity used daily

Average Lead Time in Days is referred to as ALT.

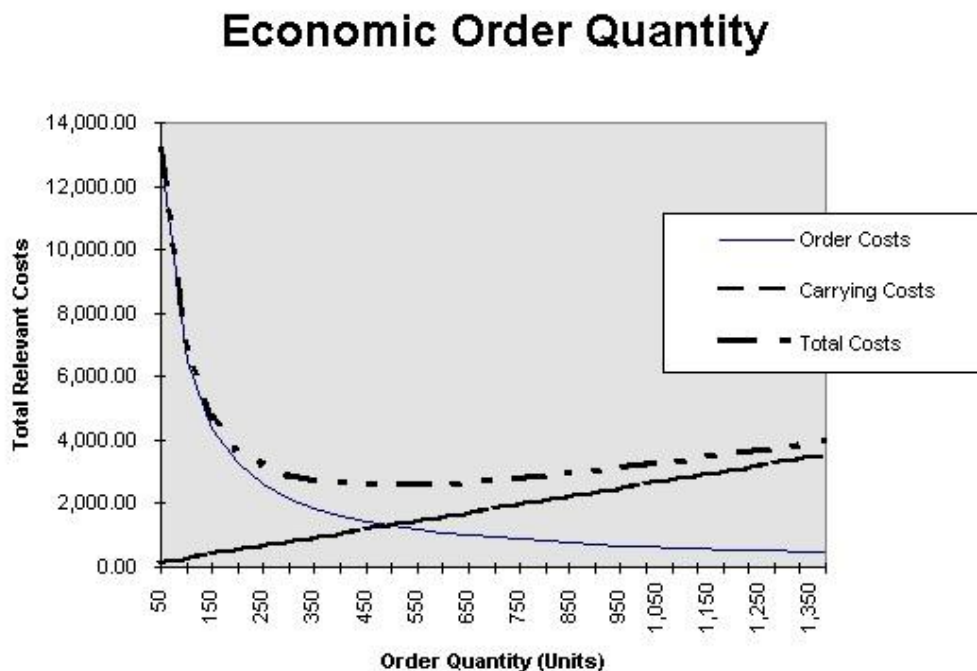
Thirdly, you must be aware of how much to order. The Economic Order Quantity, or EOQ, is determined by a challenging mathematical equation. The equation takes into account the tension that exists between acquisition costs and inventory carrying costs: when you order large amounts less frequently, your acquisition costs are low but your inventory costs are high because of high inventory levels. Inversely, because you are spending more resources on

manufacturing, your acquisition costs are higher when you produce small quantities more frequently. The optimal quantity (EOQ) is that which minimizes the total of these two costs. The following strategies have been put forth to try and accomplish the aforementioned goals:

- The economic output amount (E.O.Q)
- The ABC method
- Just-in-time delivery (JIT)

### 2.8.3 Mini Max Inventory method

This model is designed to determine the ideal quantity of oil that will reduce the expenses of oil extraction and caging. It is sometimes referred to as the economic oil quantity. It is an accounting technique that determines the lowest level of total cost related to designing, producing, and maintaining inventory.



Source: Frank Woods (2015)

Figure 2. 1 Graphical representation of the E.O.Q model

When the selling cost and holding cost intersect on the gap, the overall cost is at its lowest, making this quantity the most cost-effective to sell. As an example from the previous example

20D

E □

$$\sqrt{\frac{O}{H}}$$

500 units make up the E.O.Q . The fundamental EOQ formula is:

Where; O = fixed expenses per unit

D = number of units in per unit time (annum)

H stands for the annual cost of keeping one item in stock for a year.

E = Quantity of units per economic unit of measure.

To determine how much to order, the use of this equation is essential. It makes the supposition that demand is steady and doesn't change over time. However, demand for a product does not change over time when it enters a growth phase.

The following presumptions form the foundation of the fundamental economic order quantity model:

- The desire for products is well established.
- The wait time required to receive an order is predictable and continuous.
- No multiple discounts are offered.
- The receipt of inventory is immediate and occurs in one batch.
- The only inconstant costs are ordering and carrying costs
- Stock outs or shortages can be prevented if orders are put on at the right time.

In using this method of stock control problems are encountered on:

- The process of determining the appropriate data inputs to accurately present inventories and operations.
- Using all storage and material handling costs to determine shipping costs, which frequently produces extremely inflated figures and inaccurate E.O.Q calculation results.
- Using all expenses related to purchasing and receiving deposits to determine the overall cost. Additionally, this raises figures.
- Companies determine the storage cost percentage for the E.O.Q calculation by dividing total warehouse expenditures by the average inventory. This frequently includes expenses that are not directly impacted by inventory levels and do not account for the characteristics of storage.

Though the economic order and reorder quantity formula is just the basic formula, there are several constraints and problems due to which this model has to be modified. The following are some inventory management techniques that are based upon the EOQ, but have some or the other modification as per necessity:

**Fixed Order Quantity Model:** The fixed order quantity model is used when the supplier of a raw material is done only in specified denominations such as 10 meters of cloth, 10 kg of stainless steel, etc. In such a situation, the carrying costs, cost per order or even carrying cost per unit are constant. The annual requirement is, however, uniform and has to be set according to the supply denominations.

**Fixed Order Interval Model:** The fixed order interval models are used when the supply has to be uniform at uniform intervals, such as 10 meters cloth per week. Here all the costs and annual requirements are uniform, with an occasional rise or fall in ordering costs.

**Single Period Models:** Single period models are used in cases where the inventory items are of perishable nature. Here all time elements of the EOQ are uniform and unchangeable.

#### **2.8.4 The ABC system**

A business that has a variety of items in its inventory with varying values may use a selective control system, such as the ABC system. According to the item's value, this system separates its inventory into three groups: A, B, and C. These things, which require the most dollar commitment, are part of the A group. The elements making up the following largest investment are included in the B group. A large number of things often make up the C group, which accounts for a relatively small dollar outlay. The company can determine the type and quantity of inventory control products it needs by segmenting its inventory into ABC items. High value goods may be under tight control, while low value items may experience relative loss of control.

#### **2.8.5 The Just In Time System (JIT)**

The JIT inventory system is dependent on suppliers to deliver products for just-in-time delivery of raw materials to the manufacturing floor. The JIT approach minimizes inventories and reduces the amount of storage space required. The notion is that inventions should occur exactly when they are required for production, as the name suggests. A JIT method also necessitates cooperation from all parties involved, including suppliers and staff members of the company. Employees must encourage competitive excellence, continual improvements and 100 percent quality items so as to enable the JIT system to be successful. The development of instant information through advanced computing networks is one factor that has made this possible. Supply chain management is the coordination of various suppliers in a productive manner.

The following goals are pursued by JIT systems:

- Eliminating of non-value-adding operations
- single batch sizes

- zero faults and inventory
- zero failures, and on-time delivery services
- The buying of products that are delivered and put to use right away

## **2.9 Cash management**

For the purpose of making cash work more quickly and keeping it in uses that generate income, cash management refers to the effective administration of cash in a firm. Lockboxes, sweep accounts, and other banking services enable quick processing of received funds as well as the generation of interest revenue from deposited funds. The lockbox service comprises processing and making the necessary bank deposits, as well as collecting, tallying, totalling, and accounting for customs payments. A sweep account is one in which money from your checking account is automatically transferred by the bank into another account with a high interest rate. The term cash with reference to cash management is used to cover cash and generally accepted equivalent of cash such as cheques, draft and demand deposits in banks. The broader view of cash also induce hear- cash assets, such as marketable sense as marketable securities and bank time deposit. The primary characteristics of these deposits are their ability to be quickly sold and convert into cash. They also provide short term investment outlet for excess and are also useful for meeting planned outflow of funds. We employ the term cash management in the broader sense. Irrespective of the form in which it is held, a distinguishing feature of cash as assets is that it was no earning power. Company have to always maintain the cash balance to fulfil the dally requirement of expenses. There are four primary motives for maintaining cash i.e.

- Transaction motive
- Speculative motive
- Precautionary motive
- Compensating motive

### **2.9.1 The importance of managing cash**

A firm that holds cash has advantages in that the firm reduces transactions costs because it won't have to issue securities or borrow as frequently to raise cash; and it will have ready cash to take advantage of bargain purchases or growth opportunities. The primary disadvantage is that the after-tax return on cash and short-term securities is very low. Thus, firms face a trade-off between benefits and costs.

Cash does not enter into a company's profit and loss statement, thus it is neither a profit nor a loss. However, without cash, a company's profit remains meaningless.

- A substantial amount of cash can support a failing business despite losses.
- Effective cash management, through the use of a timely and relevant cash budget, may help a business achieve the best working capital and reduce cash shortages, as well as provide money with optimal growth.

Changes to the balance sheet and other cash flows, such as capital expenditures, that are not reflected in the profit and loss statement are part of cash management.

### **2.9.2 Methods of Easing Cash Shortages**

The steps that usually taken by a company when a need for cash arises & when it cannot obtain resources from any other source such as a loan or an increased overdraft are as follows.

- Postponing capital expenditure.-It might be imprudent to postpone expenditure on fixed assets which are needed for the development growth of the business. On the other hand, some capital expenditures are routine & might be postponable without serious consequences. The routine replacement of motor vehicles is an example. If a company's policy is to replace company cars every two years, but the company is facing a cash shortage, it might decide to replace cars every three years.
- Accelerating cash inflows which would otherwise be expected in a later period.-The most obvious way of bringing forward cash inflows would be to press debtors for earlier payment. Often, this policy will result in a loss of goodwill & problems with customers. There will also be very little scope for speeding up payments when the credit period currently allowed to debtors is no more than the norm for the industry. It might be possible to encourage debtors to pay more quickly by offering discounts for earlier payment.
- reversing past investment decisions by selling assets previously acquired.-Some assets are less crucial to a business than others & so if cash flow problem are serve, the option of selling investments or property might have to be considered.
- Negotiating a reduction in cash outflows so as to postpone or even reduce payments. There are several ways in which this could be done, reducing costs- capital and people expenses are key expenses that can be controlled tightly by having a fully integrated system that make everyone productive allowing you to accomplish more with less time wasted on non-value added activities.



- Longer credit might be taken from suppliers. However, if the credit period allowed is as ready generous, creditors might be very reluctant to extend credit even further & any such extension of credit would have to be negotiated carefully. There would be a serious risk of having further supplies refused

### **2.9.3 Cash collections and acceleration of collections**

The purpose of this is to shorten the time between when the customer submits the check and when it is acknowledged by the payee and becomes usable money. This period, known as float, can be broken down into three main parts:

**Mail float-** The time between when a check is posted and when the payee receives it, which is idle cash in, is called the post-cheque period.

**Process float-** This is the period of time between when a check is received until it is actually deposited into the business's bank account.

**The clearing float-** The length of time it takes for a check to clear the banking system is used to measure this.

Float is crucial because a business cannot withdraw funds from deposits until the checks associated with those deposits are collected. The company's finance manager seeks to minimize the float as much as possible as they are not useable funds.

Float can also be classified into negative and positive float based on whether it affects the marketability of the firm in a positive or negative way. Positive float occurs when a company pays suppliers since it will take time for the supplier's bank account to be debited, whereas negative float occurs when a company receives a check and must wait for the float period for the check to be cleared and become usable funds. By implementing the following strategies, a company will need to work on reducing float in order to speed up the cash conversion cycle.

### **2.9.4 Concentration banking**

Establishing strategic collection centers is one technique to speed up a company's flow of cash. Instead of having a single collection center at the company's headquarters, concentration banking entails the development of many collection centers, which are often dependent on the geographic areas served and the volumes of billings in those areas. This is intended to reduce the postal fee.

Customers in a specific geographic area are mandated to send their money to a collection agency there. The funds are deposited into the collecting agency's bank account as soon as they are received. To reduce the overall working balance requirements, the many local banks will transfer excess cash beyond a specified minimum to a central concentration account (the company's primary bank account, typically a disbursement).

This allows a business to manage its cash more effectively and invest any extra funds right away if it rises above a certain level. In other words, it creates a sizable pool of money that can be used to invest short-term capital. Investing a single pool of funds reduces the firm's transaction costs since there is a fixed cost component in the transaction costs associated with such investments. A wide variety of short-term investment vehicles are available to the company thanks to the large investment pool. Concentrating the company's funds in one account enhances their tracking and internal control. The ability to execute payment strategies that reduce idle cash amounts is another benefit of having one concentration bank. However, the profits from the investments of the released funds must be weighed against any additional expenses associated with a decentralized system as opposed to a centralized one, such as the increased number of local bank accounts that need to be kept open.

### **2.9.5 Establishing a lock-box system**

By requiring customers in a specified region to mail their checks to a specific post box inside their area, the lock box system implements a regional cash collection and deposit system. The company's neighborhood bank is authorized to regularly collect mail directly from the box and deposit the checks into the company's account. The bank electronically transmits deposit slips and payment enclosures to the company so that the company can amend the customer's account. The bank will charge a fee, but the firm will profit from the reduction in mail and clearing float as well as the removal of processing. All three parts of the float are impacted by a lock-box system.

Cost is the primary drawback of a lockbox adjustment. In addition to clearing checks as usual and compensating customers for them by making escalating deposits, the bank offers a number of services. Lockbox changes are typically not feasible if the average remittance is low because costs are virtually directly proportional to the number of deposited checks.

### **2.9.6 Investing idle cash- Cash management models**

In order to generate surpluses and make it possible for funds to be quickly converted back into cash when a need arises, cash that exceeds the amount needed for working expenses is typically invested in easily convertible assets. Systems for deciding when and how many marketable securities should be bought or sold are known as cash management models. The Baumol and Mille-O models are the two fundamental models that have been opposed.

#### ***2.9.6.1 The Baumol model***

William J. Baumol created the baumol model in 1952, which is quite similar to the economic order quantity model used for inventory management. Marketable assets are kept in reserve for cash needs or investment opportunities. A high cash holding will result in a cost that is

equivalent to the opportunity cost of investing the money to produce a return that is equal to the cost of capital. The expense of keeping your cash balance too low will be equal to the chance lost to take discounts, borrow money, or convert assets into cash.

As cash is retained, the opportunity cost of doing so increases. The transaction cost of converting assets to cash will increase if insufficient cash is held. There is a level of holding cash that will produce the lowest cost of managing cash as opposed to converting assets to cash. This level ought to result in a maximizing of the interest received on marketable securities and a reduction of the costs associated with selling them. Instantaneous replenishment and simultaneous use of cash are the assumptions made in this approach. By determining the ideal cash conversion quantity, this method provides for cost-effective transaction cash balances. Cash is consumed as an inventory item that can be assuredly used in the future to settle transactions. The company controls its cash inventory based on the costs associated with converting marketable securities into cash (conversion costs) and the opportunity cost of forgoing interest while holding cash in excess of marketable securities.

The cost-minimizing quantity for economic convergence in which to convert marketable

security is given by: 
$$\sqrt{\frac{2BT}{I}}$$

When converting marketable securities into cash, Where B = Fixed transaction cost  
T is the period demand (annual cash demand).

Q is the ideal withdrawal size

. I stands for the opportunity cost of retaining cash (interest on marketable securities).

The model has been criticized for its assumptions' limitations, which include the following:

- The model implies that a firm will maintain a steady cash balance, which is not always the case in actual practice.
- The model does not account for uncertainty in cash flows, and cash inflows are not taken into consideration either.

### ***2.9.6.2 The Miller-Orr model***

As a stochastic model, this one is based on the real-world supposition that currency movement is random. It takes into account changing inflows and outflows of cash throughout time. It presumes that daily net cash flows are distributed uniformly. The model's primary goal is to determine how many marketable securities the company should sell and buy. When the company reaches the low limit of its cash balance and needs extra funds, it sells marketable

securities. When it reaches its upper limit and must reduce the cash balance, marketable securities are purchased.

Fig 2.9.6.2 represents the Miller-ORR model and sets target cash level of Z, it allows for cash fluctuations between point A and B.

The company will invest a sum equal to AZ in marketable securities when the cash flows reach the upper limit line A in order to generate enough money to bring the cash holdings up to target level Z. The company's attitude toward risk determines the low limit of cash. The model presupposes that the transaction costs associated with purchasing and selling investments are stable and that the opportunity cost of keeping cash is equal to the nominal investment rate.

$3b\sigma^2$

Mathematically:

$$\sqrt[3]{\frac{3b}{4i}}$$

$$\text{Upper limit} = 3Z - 2B$$

$$\frac{4Z\sigma^2 B}{3}$$

$$\text{Average cash balance} = \frac{4Z\sigma^2 B}{3} \text{ Where:}$$

Z = optimal return point

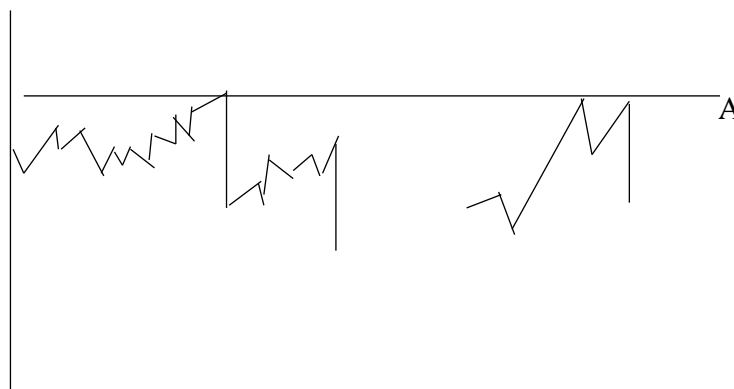
B = cost per order of converting marketable securities into cash or cash to marketable securities.

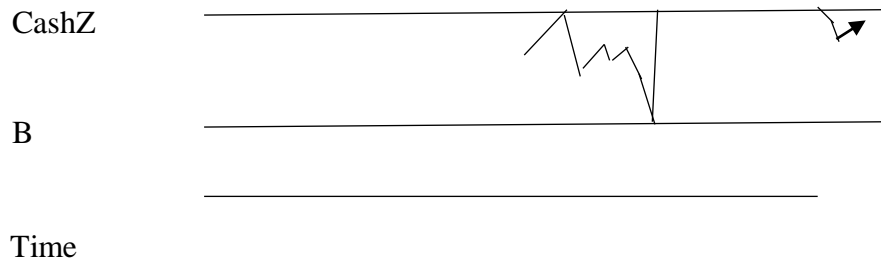
$\sigma^2$  = The variance of daily cash balances i

i = the daily interest rate on short-term marketable securities

B = the lower cash limit

Figure 2.9.6.2





### **2.10 Accounts Payable Management:**

Paying the bills is only one aspect of accounts payable management (APM). An organization's financial spending is tracked, controlled, and optimized by the APM. The goal is to have a management system in place that not only saves you money but also controls costs, whether it be money spent on goods or services for direct input, such as raw materials used in the manufacture of products, or money spent on indirect materials, such as office supplies or other miscellaneous expenses that are not a direct cause of the finished product. Creditors are a crucial component of efficient cash management and should be carefully managed to improve the financial situation. In business, there is an old proverb that states that if you can buy well, you can sell well. It's just as important to manage your creditors and suppliers as it is to control your debts. It is crucial to follow up on your invoices because late payments from you could lead to resentment and indicate that your business is inefficient (or in trouble!).

Building a strong and trusting relationship with customers depends on your payment policies. For each supplier, reliability, price, and quality should be the primary purchasing goals. Make sure the buyer understands the terms and conditions of the payment by writing them down and agreeing to them by signing. Utilize discounts by paying promptly, and note the creditors who are likely to be rigid and who might seriously harm the business if you don't exercise your right to change interest rates on late payments. Keep them informed, particularly when you refuse to pay for damaged goods. Create a solid reputation so that companies can trust you and the information you provide.

### **2.11 Working capital management in hyper inflation**

In a time of high inflation both trading and manufacturing companies will need more working capital to maintain their existing level of activity. But it is desirable to check the increasing demand for more working capital as the government opts for a tight fiscal policy to cut down inflation (Baveld, 2012).

To keep the working capital requirement unchanged a company has to take some measures on all segments of its operating cycle. An over-trading situation will be created if a firm tries to

invest, beyond its capacity, in stocks and on debts. Overtrading causes acute shortage of cash, as under it the day-to-day outflows exceed collections. To check overtrading, disposal of slow moving and obsolete stocks is a must (Le, 2019). Increasing requirement of working capital will be reduced, at least to some extent, if the span of operating cycle can be reduced. Cutting down the time span of operating cycle would make greater turnover at shorter intervals possible. This will help quicker debt settlements.

Getting adequate credit facility from suppliers depends on a firm's credibility with its suppliers. Timely payments to creditors help a firm build good relationship and increase its bargaining power. Cash inflows and outflows have to match to avoid liquidity crisis.

To achieve these targets following areas will have to be given priority: reducing set-up times, purchasing or manufacturing only what is needed now for timely delivery to the customers and ensuring a synchronized and balanced distribution of uneven workloads among workers and machinery.

In mixed-model manufacturing lines, where more than one gas types is produced, synchronization of workloads has to match the set-up times. The Gasmaking system would need a flexible capacity to respond quickly to increases in demand. Making the production process flexible, without automation, can be possible by removing unnecessary equipment and activities. It would make production more flexible without investment of additional fund for automation. Timely transportation and material handling would provide lead time. Proper monitoring of these areas by entrepreneurs would ensure stocks maintenance and timely shipment.

Economies of scale enable a producer to offer his product at competitive prices, needed to capture a larger market share. In time of high inflation, economies of scale in the production process would be more helpful for the domestic economy.

All these measures can help maintain working capital at the desired level during high inflation given increased productivity of workforce using the existing equipment. Before going into any incentive scheme, the cost involved must be calculated weighing the benefit to be derived. Increased productivity adds value and reduces labor cost per unit. This would act as a cost cutting measure to offset higher prices of other inputs in a period of high inflation.

It would help maintain working capital at the desired level without injecting additional funds.

## **2.12 Poor management of working capital.**

### **2.12.1 Symptoms**

In general the following causes are seen in inefficient management of working capital.

- Excessive carriage of Inventory over the normal levels required for the business will result in more balance in trade creditors accounts. More creditors balances will causes strain on the management in management to cash.
- Working capital problems will arise when there is a slowdown in the collection of debtors.
- Sometimes capital goods will be purchased from the funds available for working capital. This will result in shortage of working capital and its impact is on operations of the company.
- Unplanned production schedules will cause excessive stocks of finished goods or failures in meeting dispatch schedules. More funds kept in the foam of cash will not generate any profit for the business.
- Overtrading will cause shortage of working capital and its ultimate effects are on the operation of the company.

### **2.13 Impact of the Covid-19 pandemic on Working Capital Management.**

The crucial issue is that all businesses will experience changes in their liquidity management strategies during a crisis (Campello et al. 2010), but businesses with worse financial standing are more likely to suffer (Ivashina and Schafstein, 2010). During the Covid-19 epidemic, BOC Gases in particular saw large income inflows from sales of medical oxygen and covid19 treatment accessories like egulatos from both individuals and businesses. Due to the strong demand for medical oxygen and the fact that BOC Gases was the only supplier of the product, this improved BOC Gases' cash situation; nonetheless, it was unable to keep up with stock requests. Debts like those of public organizations and private hospitals are frequently purchased on credit and accounts receivables rose in amount.

### **2.14 Review of the empirical evidence.**

On top of the theoretical framework, it is also of great importance to consider and review what other authors have obtained during their related researches. The study by Gadelius and Lasson (2019) focuses on some civic issues such as cost containment, reducing investment in working capital, and improving working capital efficiency. It highlights the need for several industries to improve their overall return on capital employed (OCE).

Both the earlier study by Deloof (2007) and the more recent study by Shin and Soenen (1998) demonstrated a very significant relationship between working capital management metrics and corporate profitability. According to their findings, managers can decrease profitability by reducing the number of days' worth of receivables and inventories. This is particularly important for small businesses that must finance increasing debt loads. Agha (2014a) agrees with others that working capital management has a substantial impact on profitability and claims that managers may increase profitability by reducing inventory turnover, accounts receivable turnover, and credit turnover.

However findings by Akgun and Karatas (2020) reveal that there is a negative relationship between cash conversion cycle and profitability. This complies with the findings of Handley and Limao (2015) who recommend that firms should forecast their sales and hold cash enough as according to their projected sales level and take advantage of bargains.

### **2.15 Conclusion**

The analysis in this chapter has laid an understanding on what working capital management is the importance of managing it and the consequences of its ineffective management. The above example, provided by experts, highlights a typical phenomenon: managing working capital necessitates weighing the costs and advantages associated with each component of working capital in order to make the best possible use of it.



## **Chapter 3**

### **Research Methodologies**

#### **3.1 Introduction**

Research methodology refers to the systematic, focused and collection of data for the purposes of obtaining information in order to solve problems. It is the evaluation and justification for employing a specific methodology in a particular investigation. This chapter aims to provide a description of how each study will be carried out, including all of the actions and procedures that will be taken throughout the study. The chapter describes how different people were chosen for the study and how different data collection techniques were employed. The primary goal of the study is to examine and assess how well-working capital measures affect the value of the company. This will be done by creating an empirical framework based on the study's subjects and data collection techniques (Enqvist et al, 2014).

#### **3.2 Research design**

A research design, according to Coope and Schindle (2003:146), is a strategy for conducting research that is intended to produce answers to specific questions. The study design theory is a strategy for the entire study that outlines the course of the research's course of action. Thus, a research design provides answers to queries like: How will the data be collected? Which type of sampling will be carried out? How will disagreements be resolved? The descriptive approach was essentially adopted as the research design in this study (Salehi et al, 2020).

The research is both quantitative and qualitative in nature; it involves the use of literature reviewed in chapter two on what liquidity is and working capital elements and the importance of managing working capital to set out the research background. It is descriptive in nature since the study aims to gather information that enables us to describe the characteristics of successfully operating capital management. This method was determined to be more appropriate for this study since it provides great assistance in determining the relationships between various variables and is simple to use (Salehi et al, 2018). This design is affordable and effectively reduces financial costs without compromising the effectiveness of the approach. However, its design heavily relies on factors that guarantee high degrees of accuracy. As part of the qualitative data, a questionnaire was released and interviews were conducted. The second round of data collection is described in chapters 1 and 2.

### **3.3 Methods of collecting data**

Questionnaires were the primary method of gathering information for survey data. Aside from gathering clarifications on issues that need clarification, interviews were also held so that certain concerns that could not be adequately addressed in the questions could be clarified.

#### **3.3.1 Questionnaires**

A questionnaire is an instrument for gathering data through carefully crafted questions, according to Zikmund (2000: 366). To gather data, mostly qualitative data, sets of questions were emailed to the desired respondents. We utilized open-ended questions to allow respondents to appropriately express their opinions and viewpoints.

##### **3.3.1.1 Advantages**

- They give the respondent ample time to research and think of an appropriate answer.
- Questionnaires have a potential to cover wide geographical coverage as they can be sent to any location or site of research interest.
- Questions are typically inexpensive to administer because the only costs involved are printing and shipping.
- Self-administered questionnaires give respondents the freedom to complete the questions at their own convenient times and give them the time to consider their answers.

##### **3.3.1.2 Disadvantages**

- respondents may fail to interpret questions and may thus give inaccurate answers.
- None or late response.
- respondents may fail to express their views adequately.

### **3.3.2 Interviews**

Insider perspectives were held through interviews to inform professionals' opinions. In-depth discussions were done to provide justification for comments made on the topic and any extra information on problems that the questionnaire couldn't have adequately addressed.

#### **3.3.2.1 Advantages**

- Provides detailed explanations, which could not have been incorporated in the questionnaire.

- Places the respondent at ease such that opinions are effortlessly expressed. Interviews provide assurance that opinions may not be traced back to respondents hence they provide a flexible and friendly background to discussion.
- It is easy to detect the emotions and feelings of the interviewee.
- The response is obtained immediately.

### **3.3.2.2 Disadvantages**

- The researcher may influence the respondents' answers.
- Interviews are time consuming; the respondent may be wary of long interview sessions and hence may limit answers to brief assertions.
- Costs involved in travelling to different geographical locations to hold interviews make interviews expensive to hold.

## **3.4 Secondary sources**

The researcher extensively used publications done by accountants and investors world over.

### **3.4.1 Advantages of secondary sources**

- Using secondary sources was less expensive than setting up investigations, although care was taken to ensure that the data:
- Is relevant,
- Altered to fit the issue and is dependable.

## **3.5 Population**

Population refers to all candidates who are relevant to the election in each survey. Ding et al. (2020) noted that judgmental sampling is applicable when the examiner wants a sample of examinees, which was the case in this study. The sample was chosen based on the size of the company as well as whether it would be feasible for the examiner to obtain information from that specific company. The population in the research consists of 2 people per branch making them 10 from all the 5 branches. BOC gases due the nature of its operation and being the sole manufacturer and supplier of Industrial Oxygen tends to experience working capital problems.

## **3.6 Case Study Sample**

A sample is a representative portion of a target group that is taken in order to depict how the majority of the population behaves. It is ideally equivalent to studying the entire population while conveniently reducing the study components in cases where this is not practicable. A

sample is a grouping of some, but not all, of the components of the population under study that is used to describe the population, according to Levin (1994:52). The sample for this study was collected from 10 employees across all branches, including BOC Mutare, BOC Kwekwe, BOC Harare, and BOC Gweru.

<i>Industry</i>	<i>Department</i>	<i>Number of employees</i>
BOC HARARE	Stores	1
	Credit control	1
BOC GWERU	Sales	1
	Cylinder Control	1
BOC MUTARE	Procurement	1
	Sales	1
BOC BULAWAYO	Credit Control	1
	Stores	1
BOC KWEKWE	Finance	1
	Sales	1

Source: Raw data

*Figure 3. 1 showing the sample of the population in the research.*

### **3.7 Pilot Testing**

The research distributed four questionnaires to fellow students, two management questionnaires in order to establish clarity, validity, and reliability of the instrument employed. The pilot test also served to analyze the interview guidelines, and changes were implemented immediately. Prior to actually sending out the questions, a preliminary analysis was conducted. The pilot study revealed the respondents' misconceptions and the necessity of elaborating on some of the questions for greater clarity and relevance.

### **3.8 Data Validation**

Before drawing conclusions from the responses, the researcher verified if they were reasonable. The reasonableness check was conducted based on the remarks made by a respondent after providing an answer to a question. This was done in an effort to reduce sampling risk, which is

the risk of drawing conclusions from a sample that are different from those that would have been drawn from a 100% survey.

The researcher made the assumption that the data gathered from the companies would be accurate because the management participants were thought of as experts because they were the ones who had the closest contact with the business and were therefore the most knowledgeable about the potential uses of working capital.

### **3.9 Data Analysis and Presentation**

Data analysis is the process of consistently using logical and/or statistical techniques to describe, illustrate, summarize, and assess data. The questions were initially examined for physical completeness. By counting the consequences of specific facts to make drawing conclusions easier, qualitative data from the open-ended questions was analyzed through content analysis. In the following chapter, pie charts, tables, graphs, and tables will be utilized to present and analyze the primary and secondary data that the researcher will gather. In the interpretation of data, statistical methods were applied. The usage of ratios and considered-necessary Indices was another key component of the erosion.

### **3.10 Conclusion**

The thesis employed the descriptive research method. The chapter discussed sampling concerns, different types of data acquired, and procedures for data collecting and processing.

The study is now moving on to the next chapter, which will present the data and analyze and discuss the study's conclusions

## Chapter 4

### Data Presentation, Analysis and Discussion

#### 4.1 Introduction

This chapter focuses mainly on data presentation and its analysis based on the findings obtained from sent out questionnaires and interviews undertaken. reference will be made to the previous related findings and literature in the literature review chapter.

#### 4.2 Response rate

*Table 4. 1 Response rate*

STATUS	Number of Questionnaires	Percentage %
Total Sent	10	100%
Total Returned	10	100%
Fully Completed	8	80%
Spoiled	1	10%

Source: Raw Data

##### 4.2.1 Data interpretation.

A sample frame of 10 employees' from all 5 branches was used and 80% of the questionnaires issued came fully completed. One was returned half complete and one was spoiled. The table shows that there was 100% response rate and 20% were spoiled resulting in a net response rate of 80% which is still distinct to guarantee validity and reliability. According Salehi (2018) a high response rate signifies a good relationship between the researcher and the sample respondents.

#### 4.3 Cash flow forecast results.

*Table 4. 2 Cash Flow*

Time intervals	DEPARTMENT			
	Accounts	Sales	Stores	Procurement
Weekly		✓		
Monthly			✓	✓
Quarterly	✓			
Semi-annually				
Annually	✓			

Source: Primary data

### 4.3.1 Data interpretation

The accounts department at BOC Gases is forecasting cash flows on a quarterly and annual basis. The sales department is forecasting cash needs on a monthly basis whilst the procurement and purchasing does monthly forecasts of cash needs as well.

### 4.3.2 Data Analysis

The data shows that the accounts department does cash flow forecasts on a monthly basis which is a long period if it wants to be able to obtain accurate forecasts. Previous literature and research studies argue that cash flow forecasts should be done on a weekly basis irrespective of size, nature and sector. Mooney's (2020) research as detailed in Chapter 2 clearly explains that weekly cash flow forecasts are used to project a company's liquidity over the medium term, breaking down weekly captures of granular movements that can be overlooked if using monthly or longer periods.

## 4.4 Cash management

Cash is the lifeblood of the business that enables the business to survive and is the primary indicator of business health. The goal of cash management is to ensure that the company has liquid cash on hand sufficient to satisfy its obligations while also ensuring that any extra cash is invested to prevent it from sitting about, which is not in the best interest of the business. When it comes to investing idle funds, the business must be able to predict its demands for a certain period of time in order to convert invested funds to cash at the precise moment needed to pay suppliers and determine how long excess funds should be held in reserve. The researcher tried to find out whether the companies under study are able to forecast their needs for a given period (Lind et al, 2012). The results obtained are indicated below.

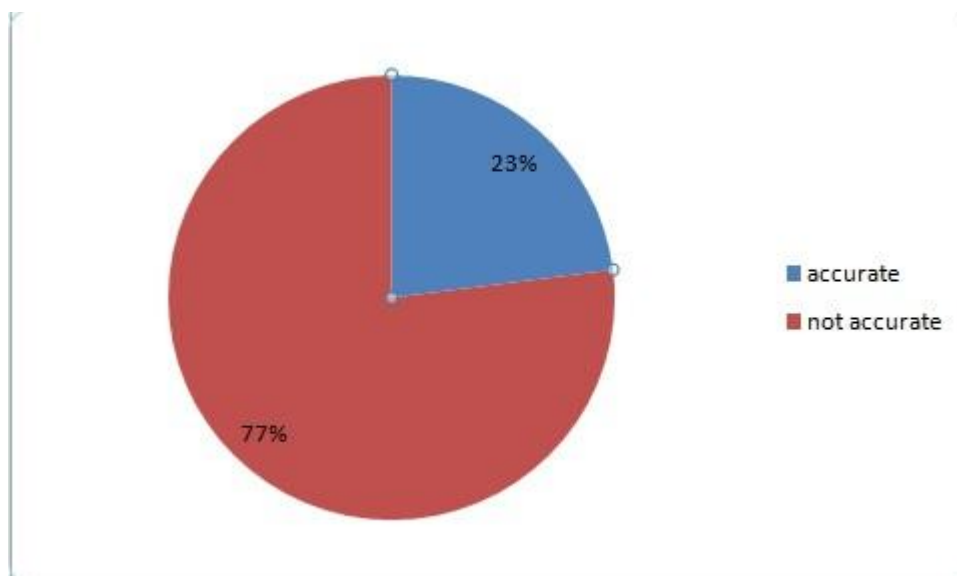


Figure 4. 1Chart showing how BOC Gases can accurately forecast cash needs.

Primary data: BOC Gases.

The analysis shows that BOC Gases cannot accurately forecast cash needs as the figures obtained shows a lower rate of 23% this is due to the time factor of cash flow intervals. BOC Gases duration of cash flow forecasts is longer than the desired one week interval. This is what adversely affects working capital management as the management of BOC Gases cannot accurately forecast cash needs.

In view of cash management, liquidity can be improved by making sure that the cash collection period is kept as short as possible thus companies should be able to control their cash collections.

#### 4.5 Cash management strategies

As well explained in the literature review chapter 2, theorist put forward the below two cash management models that are assumed to aid companies in their cash management.

Table 4. 3showing percentage of use of Baumol and Miller-Orr model.

Response	Baumol	Miller-Orr
Yes (%)	–	–
No (%)	100%	100%

##### 4.5.1 Data Interpretation and analysis.

BOC Gases claimed it does not use any of the above models and some of the employees are not even familiar with the models. 85% of the employees are not familiar and claimed they have never heard of such models and the remainder of 15% have problems in forecasting their future cash needs thus the avoidance of the model. The Baumol model works best in circumstances when the amounts required in the future may be accurately determined. The models are too complex and specialized for personnel in the finance area to use them, which is another reason why these strategies weren't used.

##### 4.5.2 Problems encountered at BOC Gases in cash management.

- The accountant at BOC Gases complained that the company's inability to forecast future cash demands was due to poor production planning, which resulted in the unexpected procurement of raw materials.



- At BOC Gases another major drawback was insufficient manpower in the credit control department. The credit control department has very little skilled manpower in the department leading to a longer collection period in the department and proper debt chasing.
- The COVID-19 pandemic came with induced lockdown periods which made it difficult to properly do cash flow forecasts as economic situations kept fluctuating.
- The high inflation rate is the most negative factor impacting cash flow forecast and realisation of cash. When debtors are paying up the cash would have lost its purchasing power as compared to when the debt was granted.

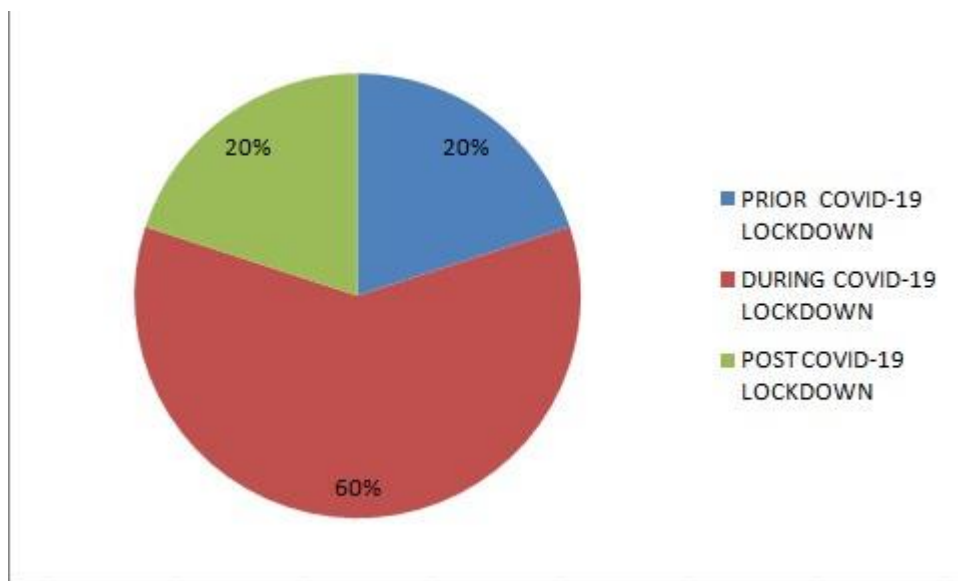


Figure 4. 2The chart below shows the rate of cash inflows in relation to covid-19 pandemic.

Source: BOC Gases, Primary data.

#### 4.6 Debtors

One of the most crucial elements to running a prosperous corporation is efficient editorial control. Without timely payments, a company's cash flow can be severely impacted, and the problems that follow can easily spiral out of control. Debt collection and control are made perfect by BOC Gases' fully furnished credit control department, which is centrally located at the company's head office in Harare.

FREQUENCY	RTGS CUSTOMERS	USD CUSTOMERS	PUBLIC HOSPITALS
Daily	✓		
Weekly		✓	

Fortnight		✓	
Monthly			✓

Source: Raw data

Figure 4. 3 showing the frequency at which BOC Gases chases for payment

The results show that the company chases for payment using the debt following procedures explained in the literature review stage and customers that buy using local currency are constantly reminded on a daily basis due to the high inflation rates. Customers that buy using foreign currency are reminded and due after one week or in a fortnight depending on the amount involved. Public hospitals are due after a month since the Government treasury pays for them after a month.

#### 4.7 How often BOC Gases receives payment from its accounts receivables.

The chart below shows how often debtors pay their debts owing and their responsiveness to the accounts receivables department.

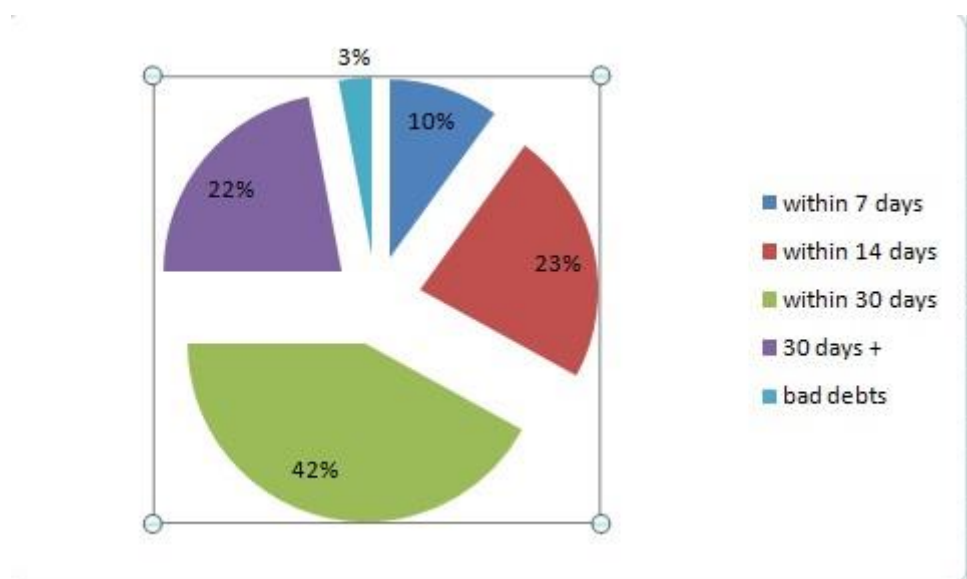


Figure 4. 4 chart showing how often BOC Gases receives payments from debtors.

Source: Raw data, BOC Gases Zimbabwe.

##### 4.7.1 Data interpretation

The data shows that only 10% of accounts receivables are paying within 7 days, whilst 23% is paying within 14 days and 42% is being paid in 30 days. 22% are paying in more than 30 days and 3% are bad debts. This is quite positive in the sense that 42% of debtors are paying within 30 days. Strict credit control procedures should be implemented to counter the 22% paying in more than 30 days and the 3% bad debts should be reduced to zero.

#### 4.7.2 Data analysis

Agha (2018) advocates that an average collection period should be between 40-45 days, whereas, Zimon (2020) advocates for a longer period to strengthen trade relationship. Due to the availability of the credit control department at BOC Gases, this led to a lower rate of bad debts and most debts are being paid within 30 days, this is due to the credit limit of 30 days given to customers.. Most organization without a credit control department receives payments in more than 30 days plus period.

#### 4.8 Creditors

Companies rely on creditors for the smooth operation of the business. The payment policy is a vital part of building a strong and trusting relationship with suppliers. Payment terms offered by the business would help so as to see whether they enable firms to make use of cheaper credit terms.

*Table 4. 4showing the trade terms offered by creditors*

<b>Credit period</b>	<b>No. of companies (%)</b>
C.O.D	35%
15 days	25%
30 days	45%
60+	0%

Source: Raw data

The results show that most companies are relaxing their credit terms to their customers although some still prefer cash on delivery as a dollar received today is worth much more than a dollar receive in  $n$  days. Despite the credit terms being given by suppliers all the companies claimed that the always delay payments as an outstanding payment may fall due when the company has insufficient funds in the bank account although they all claimed that they would never miss a payment intentionally and for not more than 30days.

#### 4.9 Inventory

Company inventory should be kept at an ideal level at any given time, by optimizing inventory levels, you reduce the risk of common inventory issues, from high storage costs to out-of-stock items.

*Figure 4. 5showing the inventory techniques employed by various departments.*

<u>Models</u>	<u>Number of departments</u>	<u>rate</u>
MINI-MAX	5	50%
J.I.T	3	30%
ABC	-	-
CONSIGNMENT	4	40%
OTHER	-	-

Source: Author

#### **4.9.1 Data interpretation**

The information denoted above shows that 50% of the departments use mini-max inventory management technique in which inventory is kept at a specific range, a minimum and a maximum stock level is set. 30% use the J.I.T method which is applied to special gases that are very expensive to manufacture and stock. These gases will be manufactured when they are needed. 40% use the consignment method; this is when BOC Gases gives distributors to sell on its behalf for a commission.

#### **4.9.2 Data analysis**

The data shows BOC Gases to be making use of the Mini-max techniques which can be called the Economic order quantity in some instances The just in time is following third on the data, this means that traditional methods are being used to manage inventory. The consignment method aids in reaching all market segments by giving distributors all over the world to sell for BOC Gases. Ali (2020) suggests that ABC since it is based on maintaining dollar value is valuable and the mini max method that states that items of low demand need lower cost servicing and therefore maintains optimum level of inventory.

#### **4.10 Problems encountered in managing inventory**

- **Unqualified employees in charge of inventory.** People that lack sufficient experience, are careless in their work, or lack suitable training have been given the reins of their invention distribution by BOC Gases. No matter the system employed, businesses must pay strict attention to inventory management and ensure that staff receive positive reinforcement.
- **Failure to identifying shortages ahead of time.** BOC Gases frequently fails to spot problems in a timely manner; a company discovers that it needs a certain number of

products or materials but does not have any on hand and must make an order. The supply chain process can be slowed down by waiting for the shipment to arrive. Poor customer relations might result from not having enough products in stock to meet demand. A supervisor in charge of inventory management should regularly review their inventory to ensure that there is enough product on hand.

- **Excessive inventory in stock and unable to move it quickly enough.** This is perhaps the most typical issue for the majority of firms. Moving inventory generates cash flow. A business loses money if it purchases a certain quantity of a product for its inventory but does not sell it.
- **Computer inventory systems are too complicated.** There are many inventory software programs available for business use. The problem is that many of these programs are not user-friendly. The majority of the users of these systems are not tech-savvy, which is something that computer software developers fail to consider. A business may not always have the resources to train staff members to use software efficiently.
- **Items in-stock get misplaced.** Even if the computer correctly indicates that the item is in stock, it could still be somewhere in the warehouse or in the wrong area of a store. Due to lost sales and increased inventory expenses since the item must be "coded," this can result in a decline in profits. Additionally, the business must allot staff time to track down the lost item.

#### **4.11 Conclusion**

The information gathered is adequate to achieve the study's goals and will allow for the drawing of insightful findings. The respondents provided insightful information on how they manage working capital as well as the challenges they face when trying to put in place an effective working capital management system. The data analysis in this chapter helps highlight the key working capital components and the challenges BOC Gases and other gas companies are currently facing. Zimbabwean businesses are working to ensure that they can fulfill their contractual responsibilities without suffering business interruptions. Using the information gathered, it is thus possible for the examiner to draw significant conclusions and offer necessary recommendations (This will be covered in the next chapter).

## **Chapter 5**

### **Summary, Conclusions and Recommendations**

#### **5.1 Introduction**

The study was able to draw conclusions about these findings and make recommendations on the subject after carefully examining the findings of the primary study and the literature on working capital management. The liquidity evaluation part covered the major goal of how businesses might use working capital to improve and strengthen liquidity. A study was conducted to see whether the established principles are applicable to Zimbabwean industries and to learn about the challenges facing the gas industries as they attempt to achieve the goal of minimizing cash flow issues (the results of which were discussed in the previous chapter).

#### **5.2 Summary of the Findings**

The research study focused on showing an analysis of the effectiveness of working capital management in gas industries, a case of BOC GASES. It was on the bases of various objectives which includes explaining the objectives of managing working capital and to what extent these objectives are being achieved at BOC GASES, explaining the concept of liquidity and insolvency, explaining problems being faced by gas companies in trying to manage their working capital and possible solutions to the problems being encountered, to determine the applicability of various model techniques in working capital management and their impact on the overall performance of gas manufacturing and retail companies, to investigate the impact of hyperinflation on the management of working capital policies and to determine the effects of the Covid-19 pandemic on working capital of Gas Companies. The researcher went on present on the background of the study in chapter 1 and its significance to the researcher, university and organisations.

The researcher reviewed literature on the effectiveness of working capital management in gas industries globally, regionally and nationally being guided by the objectives of the study and acknowledging other researchers, writers, journals, books and articles. The researcher made use of qualitative and quantitative methods of collecting data through the use of questionnaires, interviews and secondary sources. Chapter four the researcher analysed and presented data where he made use of graphs, charts and tables.

### **5.3 Recommendations**

5.3.1 How companies in the gas industry can effectively manage their working capital to reduce insolvency and increase shareholder value.

- incentivizing cash performance;
- tightening management of payment terms for customers and suppliers;
- improving credit, billing, and collection processes;
- establishing leading demand forecasting processes;
- Building greater linkage and closer coordination across the entire supply chain.
- Aligning inventories with the market and customer demand;
- Using as the chief metrics cost structure and the return on sales;
- Implementing processes closely allied with manufacturing for production planning and distribution to balance supply and demand;
- reducing inventories of WIP and finished goods; and

#### **5.3.2 Measures to Improve Working Capital Management**

- Proper cash flow forecasting is the cornerstone of efficient working capital management. This should consider the effects of unforeseen circumstances, market cycles, the loss of a prime customer, and competitive actions. It is important to factor in how unexpected needs will affect working capital.
- Having backup plans for unforeseen circumstances is beneficial. Other businesses need to have risk management processes even though market leaders can manage uncertainty better. These must be founded on an impartial and realistic assessment of the cost of capital.
- Addressing the problem of working capital at the corporate level provides some benefits. It is possible to use the money generated at one site another. Information access, effective banking channels, strong connections between production and billing, internal cash-moving systems, and solid safety procedures need all be in place for this to happen.
- Identifying and putting into practice strategies that generate quick money will require an inventive approach that combines operational and financial expertise with a comprehensive understanding of the company's operations. This can be accomplished by selecting the proper group of executives to be in charge of setting goals and performance standards. Then they are made to answer for what they delivered. Additionally, they are encouraged to take initiative and act as change agents.

- Effective dispute resolution procedures in customer relationships will go a long way toward freeing up money that would otherwise be locked in because of conflicts. Additionally, it will enhance customer service and free up time for legal tasks including sales, ownership of property, and money collection. Overall, efficiency will decline when operating costs are reduced.
- Cooperating with your customs rather than concentrating solely on your own operations will also produce positive outcomes. If possible, assisting them in effectively planning their inventory equipment to match your production with their consumption will aid in decreasing inventory levels. This is also possible with supplies.
- Firms can reduce their cash balances by holding marketable securities, which can be sold on short notice at close to their quoted prices. Marketable securities serve both as a substitute for cash and as a temporary investment for funds that will be needed in the near future. Safety is the primary consideration when selecting marketable securities.

### **5.3.3 Solutions to the problems hindering Gas manufacturers and retailers to achieve efficient working capital management.**

Using debt factoring. The cost of the service should be weighed with the cost of in-house debt collected for example having sufficient cash to benefit from early payment discounts from suppliers.

Companies should know their customers and ensure they are able to pay their accounts before you offer them any credit facilities. This might seem like looking a gift horse in the mouth but a debtor becoming insolvent owing you two to three months' work will create a big hole in your finances for something.

Agree payment terms before you supply. If they intend taking 60 or 90 days to pay you should find out before starting the contract and make a positive decision to take the work or not and figure out how you will manage until the debt is paid.

Create an invoice quickly and accurately. Make sure you are aware of who and where to send bills, as well as what information they must include. Don't wait until the end of the month to issue invoices; do so right away. This may cause the customer to process another person's invoices in front of yours.



#### **5.4 In light of cash management, how appropriate are theoretical methods of managing working capital to the gas businesses in Zimbabwe?:**

The adoption of numerous ideas from theoretical methods demonstrates the obsession that most of the ways were suitable to manufacturing industries. Although their applicability was constrained by the economic environment in which these enterprises operate, these theoretical methods are only relevant in stable environments, hence they were inapplicable during the hyper-inflation period (Nollet et al, 2017).

#### **5.5 Working capital management in hyperinflation environments.**

During hyperinflation, most gas companies are preferring to hold more non-monetary assets than monetary assets. This is so because the value of non-monetary assets appreciates with rising inflation (Chang et al, 2019). It must be realized however that though it might seem noble and prudent, this results in cash being tied in long-term assets, which may not be easily convertible into cash when required. My recommendation to this is that such activities must be constantly supervised by the central government so as to avoid liquidity problems.

In addition to this companies must consider making use of strategies that help determine how much of non-monetary and monetary assets should be used to finance a given level of activities. This is so because as has been discussed in the literature review section, the cheapest form of capital considering the economy that the Zimbabwean gas companies are operating in is making use of working capital management so as to strengthen liquidity. This would mean that holding too much of fixed assets which cannot be easily converted into cash will intensify the cash flow problems that the companies are going through (Sandberg and Mena, 2015). On the other hand companies need a certain level of fixed assets to ensure their continued survival, thus the need for measures to determine how much of which kind of assets to hold at a given point in time.

#### **5.6 Causes of poor performance with regard to working capital management.**

1. Poor inventory turns. This is caused by too much emphasis on reducing stock outs (which increases investments in inventory) and delays resulting from regulatory burdens and less-than-optimal quality policies and procedures (Popescu and Popescu, 2019)
2. Poor accounts-receivable turns which are mainly due to the recent direct-to-pharmacy trend in some countries (pharmaceutical companies) and longer payment cycles peculiar to some geographic areas.

3. Unaddressed accounts-payable issues caused by frequent lack of contract structure for the purchase of indirect materials, lack of consistent "Terms and Conditions across different countries or Business Units" and little purchasing-department engagement "early on in the r&D phase"

### **5.7 Policy implication**

Working capital management should be of concern of all manufacturing sectors and need to be given due importance.

The collection and payment policies of the firms in manufacturing sectors need to be thoroughly reviewed.

Accelerate cash collections and slow down payments which can be achieved with the assistance of professional advice and supervision.

Firm managers can enhance the performance of the firms by reducing the number of days of inventory and cash conversion cycle to a reasonable level. This can only be possible if the components of the net trade cycle may be dealt with individually and an optimal effective policy is formulated for these components.

### **5.8 Conclusion**

An important yardstick to measure a company's operational and financial effectiveness is working capital management. This factor needs to be considered in the strategic and operational thinking of the business. Continuous efforts should be made to strengthen the working capital situation. This will increase customer happiness and produce greater efficiency. An organization's working capital requirements and internal cash generation rate alter over time. As a result, the small businesses should ensure that their assets and liabilities are well synchronized.

The results of the study show that there is a statistically significant relationship between profitability measured by gross operating profit and the working capital cycle. According to the study of the firms listed in the previous chapter a well designed and implemented working capital management is expected to contribute significantly to the creation of the firm's value while non-attention to working capital management can lead to insolvency. The results also show that a high investment in inventories and receivables is associated with low profitability and showed an increasing trend in the short term component of working capital financing.

The results also show that for overall gas sector companies' working capital management has a significant impact on profitability and insolvency and plays a key role in value creation and shareholder as longer cash conversion cycle and net trade cycle have negative impact on the net operating profitability of the firm. There exists negative association between inventory turnover days and net operating profitability for the gas manufacturing sector as a whole which implies that keeping lower inventories as a whole will increase profitability.

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## **Appendix 1**

Bindura University of Science Education

P.Bag 9055 Bindura

4 February 2014

Dear Sir/ Madam

RE: RESEARCH PROJECT ASSISTANCE

My name is Felix Tanaka Gomwe. I do hereby apply for permission to carry out research in your Organization. My research topic is entitled: -**“An analysis of the effectiveness of working capital management in gas industries. A case study of BOC gases.”**

The research project is done in partial fulfilment of the requirements of the Bachelor of Accountancy Honours Degree. The data will solely be used for academic purposes and a high level of confidentiality shall be maintained over the data. If you have any queries, please do not hesitate to contact me on 0715789560, or email felexgomwe@gmail.com or the Department of Accounting Chairperson.

I thank you for your time and your cooperation.

Yours faithfully

---

Felix Tanaka Gomwe

## Appendix 2

### Questionnaire

Details of the responded

1) Branch name

---

2) Position

---

3) Duration of employment 0-5yrs  6-10yrs  10+

4) Gender male  female

Cash management

5) To what extent can you control your cash collections?

Slightly  moderately  significantly  no control

6) Which strategies do you employ to ensure speedy cash collections?

Lock box system  Concentration banking

Other (specify) \_\_\_\_\_

7) Do you use any cash management strategies like the Miller-Orr and Baumol models?

Yes  No

a) If yes how relevant are they? \_\_\_\_\_

8) Do you have a minimum cash holding level?

Yes  No

a) If yes what do you do with the excess cash?

---

9) How do you manage your cash to ensure there is enough to cover unexpected expenditure?

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10) How often do you do cash flow forecasts in your department?

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11) On a scale of 1-10 how do you find your cash flow forecasts to be accurate?

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**Inventory**

12) Do you have a minimum stock holding policy and why?

---

13) Which system do you use to manage your inventory?

ABC system       JIT       EOQ

Other (specify) \_\_\_\_\_

14) What elements constitutes your holding costs

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15) What elements constitute your carrying costs?

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16) How do you manage the two above

---

17) What problems do you encounter in trying to manage inventory if any?

---

---

**Debtors**

18) Do you have a credit control department within your organization?

Yes  No

19) How often do you chase up on payments?

Weekly  fortnightly  monthly  20)

Which method do you use to follow up on payments?

Telephone  visits to customers  email

Other (Specify) \_\_\_\_\_

21) What problems do you encounter in trying to manage your receivables?

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### Creditors

22) On average what are the credit terms offered by your suppliers?

COD  15 days  30 days  60 days +

23) How often and for how long do you delay payments?

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24) Do your customers offer you discounts for early payment?

Yes  No

25) What problems do you encounter in managing your creditors?

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Credit extension in a hyperinflationary environment

26) Are you still extending credit to all your credit customers as usual?

Yes  No

27) If it is a no please state the reason why

---

---

**28) Are there any problems you are encountering in managing working capital due to inflation?**

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---

**Covid-19 and working capital**

**29) Are you familiar with the covid-19 pandemic?**

Yes  No

**30) Was the company fully operational during the covid-19 heat period?**

Yes  No

**31) If it's a no, how were you operating?**

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**32) What was the impact of the covid-19 pandemic on your operations in terms of sales and stock quantities in general?**

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### **Appendix 3**

#### **INTERVIEWS**

##### **Interview questions to the credit controller.**

1. What challenges does BOC Gases face in managing components of working capital?
2. What system do you have in managing your accounts receivables?
3. What is the impact of inflation in credit extension and recovery?
4. Were there any notable changes on accounts receivables during the covid-19 pandemic?
5. Do you have set credit limits for your customers and how do you categorize them?

##### Interview questions to the stores controller

1. Do you have an inventory management system in place?
2. What are the most significant problems you face in managing your inventory on a regular basis?
3. What is the impact of inflation on inventory management?
4. Were there any notable changes on inventory management during the covid-19 pandemic?

##### Interview Questions

- 1) What components constitute your working capital?

---

2) Do you use ratio analysis to measure your working capital efficiency and if so how effective are they?

---

3) Have you ever experienced liquidity problems?

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b) If answer to 3 above is yes what caused it and how did you remedy the situation?

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c) If answer to 3 above is no how you have done it (strengths of the system you are using)

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4) How do you finance your current assets?

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5) Before the introduction of the multi-currency i.e. during the hyperinflation periods how did you manage particularly your cash knowing that it could be valueless the following day?

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6) In general what do you think are the causes of poor performance with regard to working capital and how can these problems be mitigated?

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7) Any word of encouragement to the firms out there on how they can manage their working capital?

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# Working capital management

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