

Effect of Inventory Control on Profitability: a Case of Skol Brewery Ltd

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Abstract: - This study assessed the impact of inventory control on profitability particularly in Skol Brewery Ltd. The objective of the study was to assess the impact of inventory control on profitability particularly in Skol Brewery Ltd. The study was guided by the following research questions: what is the role of buffer stock (price stabilization, variability of demand and suppliers' chain) on profitability of Skol Brewery Ltd? What is the effect of lead time (preprocessing time, processing time, and storage time) on the profitability of Skol Brewery Ltd? And what is the impact of replenishment of stock (stock availability levels and smart inventory purchasing) on the profitability of Skol Brewery Ltd? The study utilized quantitative research design contains with descriptive research design. The population of this research was 30 employees of Skol Brewery Ltd and was given a questionnaire. Data obtained from the questionnaire were processed into SPSS. Purposive sampling technique was used; questionnaires were used as instruments of data collection. The computation of findings involved both inferential and descriptive statistics. Descriptive findings involved computations of frequencies, means and standard deviation, and multiple linear regressions. The mean used is $\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i$ and the standard deviation being $(S) = \sqrt{S^2}$ Where, $S^2 = \frac{1}{n-n} \sum_{i=1}^n (x_i - \bar{x})^2$

The research findings indicate that inventory control is effective and they greatly affecting the profitability of Skol Brewery Ltd; however, there are some challenges such striking a balance between overstocking and running out of store and underproduction stoppages, ineffective stock management can lead to inadequate holding of stock. Therefore, from the findings, the researcher concluded that this implies that the regression model is significant in predicting the relationship between inventory control variables and profitability of Skol Brewery Ltd and the researcher recommended that Skol Brewery Ltd should make sure the storage cost of the available or left over stock be maintained at a reasonable level of cost so has not to draw the cumbersome quota on the profit realized and also cost of sales have to be at minimal, so has not to expend the profit before making it.

Keywords: - inventory control, profitability, buffer stock, lead time, replenishment of stock

General Introduction

In recent years, Inventory control has attracted a great deal of attention from people both in academia and industries. A lot of resources have been devoted into research in the inventory management practices of companies. It represents one of the most important assets that most businesses possess, because the turnover of inventory represents one of the primary sources of revenue generation and subsequent earnings for the company. In the manufacturing companies, nearly 60% to 70% of the total budgets used are tied up in current assets, of which inventory

Is the most significant component (Anichebe & Agu, 2013). Thus, it should be managed in order to avail the inventories at right time in right quantity. Inventory can be also viewed as an idle resource which has an economic value. So, better control of the inventories would release capital productively (Carter, 2012).

Inventory control implies the coordination of materials controlling, utilization and purchasing. It has also the purpose of getting the right inventory at the right place in the right time with right quantity

because it is directly connected with the production. The objective of any company is to get a good return out of every cedi invested in the company (Eneje & Nweze, 2012). According to Pandey (2005) management through their policies, coordination, decision and control mechanisms must maximize the return on investment (ROI). Peterson and Joyce (2007) while supporting Pandey (2005) states that it is clear that ROI can be maximized either by increasing profit margin or by reducing the capital employed or by both. In the market situation, sales price cannot be increased (rather there is a demand to reduce it) and as such profit can be increased only by reducing the material costs. On the other hand, the opportunity to reduce the overheads and capital employed is more by inventory reduction. It is thus evident that the ROI can be maximized by either reducing the material cost or reducing the current assets by way of inventory of materials or can be optimized by increasing profits (Drurry, 2014).

Inventory of goods has many reasons why organization should maintain it. It is economically unsound and physical impossible to have goods arrive exactly when their demand occurs. Without stock at hand customers would have to wait for long period before their orders are fulfilled. Inventory management is the control of materials used and stored in a company with the objective of providing exactly what is required where and when it is required employing a minimum of residual stock and thus incurring the least possible cost (Agha, 2017).

Inventories are classified in the balance sheet under current assets as stock because of the fact that it can be turned into cash in a short period of time. It is because of its great impact on the profitability of manufacturing firms that necessitated an in-depth study of the topic. Inventories are inevitable part of the productive process and require an investment of the company's money since the company has paid for them but not yet sold (Siyanbola, 2012). Profit of an organization can easily be maximized with the help of an effective inventory control in places. Profit maximization is all about cost minimization and revenue maximization. An effective inventory control improves the firm's total performance through matching inventory management practices

and a competitive advantage especially now that most companies operate in a more competitive industries or sectors all over the world (Mahidin, 2015). The main goal and objective of inventory control is to keep at the necessary required inventory at any time so that production runs smoothly without interruption whatsoever (Panigrahi, 2013).

Manufacturing firms need inventories to produce optimal level and also make their products available to the market when needed, and hence they would expect some returns from their capital investment. Invariably, lack of inventory results to non-production or production below capacity. In such a situation, the profitability of the company will be drained especially where there is a situation of shut down. Excessive inventories connote situation where the company has more inventory than needed. This situation results to freeing the company's capital in form of holding cost, storage cost etc. (Shin & Ennis, 2015).

Statement of the Problem

Consequences of poor inventory control is failing to monitor appropriate inventory that should be kept, and this has been one of the challenges that hindered manufacturing firms from achieving some of its goals as they wanted (Nkwankwo & Osho, 2010). Skol Brewery Ltd like other manufacturing industries facing the challenges striking a balance between overstocking and running out of store and underproduction stoppages, ineffective stock management can lead to inadequate holding of stock, resulting inability to meet customers demand as at when due and loss of goodwill, decline of productivity and profitability, improper stock control can lead to drain in the resources of the company. So, this research came to help Skol Brewery Ltd to overcome these challenges and to take adequate solutions where will be needed.

1.2. Specific objectives

The specific objectives of this study were to achieve the primary objective; the following secondary objectives were formulated, namely;

1. To assess the role of buffer stock (stabilize price, variability of demand, and suppliers) on profitability of Skol Brewery Ltd.

2. To determine the effect of lead time (preprocessing time, processing time, and storage time) on the profitability of Skol Brewery Ltd.
3. To analyze the impact of replenishment of stock (stock availability levels and smart inventory purchasing) on the profitability of Skol Brewery Ltd.

Literature Review

Theoretical Review

Various theories were developed and are relevant to the explanation of the concept of inventory control and profitability and their relationship. Among these theories we can mention, the lean Theory and queuing theory. All these theories were adopted to form the theoretical foundation of this research.

Lean Theory

Lwiki (2013), indicate that “inventory management or “inventory planning and control” refers to the ongoing provision of standard items with independent demand, where some speculative quantity should always be on hand. Lean theory therefore focuses on optimization of costs in inventory systems. It is posited that through this theory, decisions on manufacturing, warehousing, and general supply chain concerns can be expedited (Schwarz, 2008). The theory builds upon the economic order quantity (EOQ) model that seeks to optimize the quantity of any individual item ordered.

Choice of Lean Theory for this study was informed by the need to examine how inventory management influences organizational performance thereby calling for a prudent approach to inventory management. The theory therefore brings to the fore, the possibility of diversity in operating systems used to monitor levels of stock, and the difference in items that may require different treatment. Lean theory is an extension of ideas of just in time. Green and Inman (2005) assessed the impact of lean theory on financial performance. They say that theory may eliminate buffer stock and minimize waste in production process. Eroglu and Hofer (2011) found that leanness positively affects profitability of a business firm. They argue that inventory leanness is the best inventory control tool. The theory elaborates

on how manufacturers gain flexibility in their ordering decisions, reduce the stocks of inventory held on site and eliminate inventory carrying costs. At the aggregate level, the empirical strength of the lean explanation lies both in the timing and the magnitude of the adoption. However, in the theory, inventory constrains a firm’s ability to respond to fluctuations in demand.

According to Lean Theory, inventory management act as a major component of any supply chain irrespective of whether it is product or service supply chain. Inventory management plays an important role in matching demand and supply within each and every partner in the entire supply chain, ultimately providing flexibility in coping up with external and internal events of the today’s uncertain, globalized business environment (Kumar, 2016). Ineffective inventory control is a major problem faced by industries in developing countries and that even the very basic inventory control concepts and techniques are not used by the majority of the companies studied. Due to the heavy reliance on imported industrial raw materials and parts, and the endemic bureaucratic delays and associated communication problems in developing countries, order lead times cannot be computed with any degree of accuracy (Green & Inman, 2005). Therefore, the Lean theory is of essence to the effectiveness of inventory management which will result to increased profitability, responsiveness, flexibility, cost effectiveness and asset management.

Queuing Theory

Queuing theory is a mathematical study of waiting for lines or queues (Obiri-Yeboah, Ackah, & Makafui, 2015). The theory enables mathematical analysis of several related processes, including arriving at the back of the queue, waiting in the queue (a storage process) and being served in front of the queue. The theory permits the derivation and calculation of several performance measures including the average waiting time in the queue or the system, the expected number waiting or receiving service, and the probability of encountering the system in certain states such as empty, full having an available server or having to wait a certain time to be served (Shin & Ennis, 2015).

Empirical Review

Etale and Bingilar (2016) examined effect of inventory cost management on profitability of listed brewery firms in Nigeria was used. Secondary data from the annual reports and accounts of selected brewery firms from the Nigeria Stock Exchange from 2005 to 2014 was used in the study. Using the multiple regression technique, the study found that efficient inventory cost management has a positive effect on profitability of brewery firms in Nigeria. The study recommended that brewery companies should adopt effective and efficient inventory cost management practices; deploy appropriate modern technology for effective inventory cost management; and employ capable and qualified staff who should be trained regularly on proper and efficient inventory cost management.

Priyanka and Hemant (2015) investigated the role of inventory management on competitive advantage for Kenyan manufacturing firms. A descriptive research design was used in the study. Self-administered questionnaires were used in data collection. The findings of the study revealed that inventory control systems, information technology, inventory lead-time and inventory control practices are vital factors in achievement of a competitive advantage for Kenyan's manufacturing firms.

Sitienei and Kioko (2015) examined the effect of working capital management on the profitability of cement manufacturing firms in Kenya. The study used secondary data for a 15 years period from 2000 to 2014. The study established that inventory conversion period positively and significantly influences profitability while average receivables period had a positive insignificant relationship with profitability. The study also established a positive significant relationship between leverage and profitability while liquidity and size of the firm had a positive but insignificant relationship with the profitability. The study concluded that inventory days, receivables period, liquidity, advantage and firm size positively influences profitability of cement manufacturing firms in Kenya.

Mwangi and Thogori (2015) explored the role of inventory management on the performance of food

processing firms in Kenya. The study used a sample of 112 respondents and a questionnaire for data collection. The study findings established that a unit increases in maintaining production, cost control, record reduced loss and continuous supply will lead to an increase in the scores of the performance of food processing company. The study recommended that inventory management should be well articulated and there should be a good management on cost control such as carrying cost, ordering cost as well and maintain production should be managed to meet demand, increase production turnover and identify opportunity.

Munyao et al. (2015) examined the role of inventory management practices in performance of the production department by manufacturing firms in Mombasa County. The study adopted the descriptive research design and a sample of 45 manufacturing firms while data was collected using questionnaires. The study findings revealed that manufacturing firms use various inventory management techniques such as the action level methods, JIT, EOQ and periodic review technique. The study found that despite the fact that that MRP was most effective in contributing to performance of the production department most organizations in the manufacturing industry used action level methods.

Nwosu (2014) examined the impact of materials management on profitability of Nigeria brewing companies using a sample size of 368 companies. The study used questionnaire and oral interviews to collect data. The study established that materials procurement and storage has significant effect on profitability of brewing companies. The study also found that materials inventory has a significant contribution to profitability of brewing companies; and that interdepartmental collaboration significantly contributed to the profitability of brewing firms. The study concluded that effective materials management is indispensable to brewing firms in making profits.

Anichebe & Agu (2013) assessed impact of proper inventory management on performance of organizations in Nigeria. The study used a sample of 248 respondents and collected data using questionnaire and oral interviews. The study findings

established a significant relation between inventory management and effectiveness in an organization. The study also established that inventory management had a significant effect on productivity of an organization and there was a strong positive correlation between inventory management and profitability of an organization. The study concluded that good management of Inventories is key to growth and success of an organization.

Kariuki (2013) examined factors that influence effectiveness of the inventory control at the Ministry of State for Provincial Administration and Internal Security in Kenya. The study established that procurement of goods delays, stock-outs and unpredictable change in prices were the effects of the long bureaucratic procurement procedure. The study also found that untimely funds dispatch has a negative effect on inventory control. The study further found that inaccessibility stores records, lack of qualified and well-trained employees hinder an effective inventory management and control system.

2.3. Conceptualization

2.3.1. Summary of Variables

2.3.1.1. Inventory control

Inventory refers to stockpiles of tangible products (raw materials, supplies, work-in-progress and finished goods) kept by a firm for running of the business for manufacturing products for trade or reuse (Bai, 2008). Raw materials are basic inputs/parts of a product yet to be converted through a manufacturing or transformational process. Pandey (2005) defined work-in-progress as semi-finished manufacturing products that are at various stages of completion in a production process. Finished goods are products that have passed the various stages of production and awaiting distribution (Kontuš, 2014). Inventories are a vital part of the production process because they link products to marketing, consumption and customer demand (Pandey, 2005). In relation to the manufacturing industry, this study defines inventory as stock that a company keeps for manufacturing its products for usage and sale.

An inventory control refers to a set of policies and controls that a firm put in place to monitor and determine inventory levels, volume of inventory and

replenishment that should be maintained (Prempeh, 2016). Inventory management is the planning, coordinating, controlling and organization of all inventory levels of raw materials, work-in-progress and finished goods (Kotler, 2012). Jessop (1999) added, stating inventory management as the art and science of maintaining stock levels set by management. The major objective of inventory management is to inform managers of how much and when to re-order and the appropriate safety stock levels in minimizing stock outs and to keep the most economical human and materials resources (Bai, 2008).

Inventory control is necessary because sufficient amount of inventory is needed to minimize the rate of stock outs in a firm. In setting inventory level, firms should consider the costs such as ordering costs, holding cost and stock-out costs. Ordering costs relates to costs incurred in placing and receiving an order for the supply of inventory. Ordering cost include; purchasing department personnel expense, communication and paper work, inspection, insurance and other related costs (Fosu, 2016). Holding costs are costs incurred in carrying inventory for current and future demand. These costs include taxes, theft, interest on funds financing, insurance, handling, opportunity cost and obsolescence (Lwiki, 2013). These costs are positively related to changes in inventory level (Fosu, 2016). Stock-out cost results when a firm is unable to meet current internal and external inventory demands. Firms could lose customers to competitors during stock out. However, this can be prevented or reduced with effective inventory management (Fosu, 2016).

Inventory control system incorporates all the functions that are associated with the management and maintenance of an inventory. A good stock control system takes care of everything, from purchasing, product tracking, and product turnover, to storage inputs, shipping and receiving, and re-ordering the products (Kotabo, 2002). In some companies, these functions may be divided into sub-departments, but in order to run a smooth inventory management operation, these steps must be performed efficiently and sequentially. This is where

an automated stock control system comes in handy. It will allow you to include all these sub-functions into a single mainframe system which can be accessed by multiple on or off-site systems while encompassing all the functions into a single cohesive system (Kotabo, 2002).

In the past few decades, companies have been experiencing the new trend of globalization. This has made many of them realize that in order to expand, small and even medium sized businesses, will have to seek out a better stock control system than a supervisor jotting down the stock information on a notepad. Since the last few years, automated stock control systems have thus, made their way into large as well as small businesses, stores and manufacturing companies, which rely completely on these systems for their inventory management. This major evolution may however, be also associated with the fact that the systems are financially efficient (Lucey, 2017).

In large manufacturing firms, a stock control system is emerging as a key element to maintain the firm's competitiveness and maximized productivity in the industry. The boost in technology has also allowed stock control systems to evolve into a complete automated package that takes the business strategies into account and alters its functions to fit the needs of the organization in a better and more efficient manner (Bai, 2008). Today, the wide availability of these automatic systems is enabling companies to incorporate them into their business effortlessly. An automated stock control system dramatically decreases the use of financial resources and increases efficiency and accuracy. Adopting this system will not only make the quantitative product analysis easier but also provide you with future projections related to the inventory. Other benefits of a stock control system are: accurate recording of data; projecting inventory needs; recording variation in inventory; retrieval of products from warehouses; sales information; customer histories; integrated financial data keeping; database connectivity to the mainframe; real-time data recording, storage and connectivity; vendor management and agreement handling; report generation; automatic stock replenishment; and automatic order placement for

products that are selling well (Melanie, 2017). All these noteworthy benefits make a stock control system a better option than a manual inventory management system.

2.3.1.1.1 Buffer stocks

Buffer stock is the extra stock that should be kept to allow for the possibility that demand may increase or supply may be delayed (Goldratt, 2014). Buffer stock is an excess amount of raw materials kept on hand to guard against any unplanned inventory shortages leading into the production process. The amount of buffer stock to retain involves balancing the cost of the extra inventory against the amount of production downtime that is avoided by having the extra inventory (Goldratt, 2014).

The buffer stock also refers to the practice by governments of buying excess commodities during periods when there is an excess supply and selling them when the supply level is unusually low. Doing so keeps commodity prices from going too low (during periods of high supply) or too high (during periods of low supply). The underlying theory is that this practice results in more stable pricing conditions for producers. The concept can be applied to many products, including oil, corn, and butter (Bragg, 2019).

Buffer stocks (also called safety stocks) are maintained by organizations to cope with demand and supply uncertainties. In retail, wholesale, and distribution environments, they are called safety stocks. People in the factory tend to call them buffer stocks because they are the buffer between one operation and the next (Schonberger & Knod, 2017). In this article these terms are used interchangeably. Safety stock is defined as the average level of the net stock just before replenishment arrives. A positive safety stock provides a cushion or buffer against a larger than average demand or disruptions in supply during the effective replenishment lead time. The level of safety stock depends on how quickly the item can be re-supplied when there is a stock out, and on the level of demand. Thus, safety stock is analogous to an insurance policy. Like in any other form of insurance, there is a price to be paid. In the case of safety stocks, this price consists of the direct and the

hidden costs of carrying the inventory or maintaining the level of customer service (Silver & Peterson, 2015).

Stabilizes Prices

The big advantage of buffer stocks is their ability to smooth out price fluctuations. When the government has a large stockpile of corn, for example, it can release some of that corn onto the market in the event of a price spike. The extra supply should bring prices back to normal. The mere existence of a buffer stock can stabilize prices even if the government never releases any supply, since the possibility of increased supply discourages speculation.

Variability of Demand

Most retailers fear out-of-stocks. “You can’t sell it if you don’t have it,” is an inventory management mantra chanted in the planning departments of many retailers. Stock outs not only drive retail planners to diversion. Manufacturing production planners’ quake with fear at the thought of a production line stopping because a critical part is out of stock. To minimize the risk, inventory managers take measures to provide insurance, building up additional inventory buffer stock to account for the variability of the real world. Buffer stock represents captured working capital, unproductive capital trapped to provide nothing more than insurance against running out of stock. If you talk about safety stock to most inventory planners, they think of lost sales, or unfulfilled demand. In the old days of retail, managers automatically thought of out-of-stocks as lost sales, applying the average sales trend to the number of days the product was out of stock. There is a problem with that methodology; it assumes that people actually wanted to buy the product at the same average rate (Priyanka & Hemant, 2015).

2.3.1.1.2 Lead Time

Lead time is ideally defined as the sum of supply delay and reordering delay”. Supply delay is the time taken by a supplier to deliver the products once they are ordered. Reordering delay is the delay time that occurs until the ordering occurs again (Sawaya, 2016).

A firm should always maintain some safety stock or buffer stock as a contingency to meet its ongoing requirements. Storing surplus stock will only increase the inventory costs and overheads of the firm. It may also lead to unnecessary wastage and loss as medical supplies like drugs have a quick expiry period. On the other hand, stock deficit or “stock-out” situations cannot be entertained at a firm where patient’s lives are involved. So, a perfect balance has to be reached between the two and this is done by computing the lead time.

Lead time comprises of 2 elements, internal and external. The internal lead time is the time taken between the decision making and the actual ordering and this occurs within the firm management. The external lead time is the taken by the supplier to process and deliver the order and this is from the supplier’s end. Lead time can be controlled with proper planning and used to regulate the supply chain and inventory of the firm (Sawaya, 2016).

The lead time tells:

- ❖ How long the firm can run on existing stock till a stock-out occurs
- ❖ When the stock should be reordered and in what quantity.
- ❖ How much safety stock is required to manage emergencies

In a firm, stocking of business supplies and ordering them all depends on the correct lead time computation. Lead time is a factor which affects the safety stock analysis and decides how much buffer stock should be stored in the firm. Reducing the lead time is the right method of efficient firm inventory management and this can be achieved only by strategic planning done with the help of expert manufacturing firms (Agha, 2017).

Components of lead time

1. **Preprocessing time:** This is also referred to as the planning time, and it includes the time taken to receive a request for replenishment, understand it and create a purchase order (when buying an item), or create a job in the case of a manufacturing firm.

2. **Processing time:** The processing time is the time taken after receiving a purchase order to procure or produce the item.
3. **Storage time:** Storage time is the amount of time that items stay in the warehouse or factory awaiting delivery.

2.3.1.1.3 Replenishment Stocks

Stock replenishment is one of the most important considerations when it comes to inventory management, as it helps ensure the right stock is on the shelves at the right time, while keeping inventory holding costs low and customers happy. Stock replenishment is the rate at which inventory travels along the supply chain from the manufacturer to the supplier to warehousing, picking, and shipment locations. The aim of stock replenishment is to keep inventory flowing through the supply chain at an optimal rate by maintaining efficient order and line item fill rates. This process helps prevent costly inventory overstocking (Glynn, 2018).

Traditionally, mastering the rate of stock replenishment was a challenge because it meant manually tracking every piece of stock as it moved along the supply chain via spreadsheets (or even a paper trail). Today, however, automated stock replenishment is made possible by intelligent inventory management systems that monitor and update stock movements automatically, without the need for manual intervention. This equals significant time savings and reduces the risk of human error (Glynn, 2018).

According to Rouse (2019), replenishment is the movement of inventory from upstream or reserve product storage locations to downstream or primary storage, picking and shipment locations. The purpose of replenishment is to keep inventory flowing through the supply chain by maintaining efficient order and line-item fill rates. Stock replenishment is the most important activity in any business as it deals with restocking the items for sale.

Stock availability levels: enable firms to fulfil orders and ensure customer satisfaction. In some industries, such as fast-moving consumer goods, where many products have high and regular demand, it's important to set very stock availability levels e.g.,

99.99%. However, in other sectors, where demand is much more volatile, it simply doesn't make sense to make such extreme commitments (Chapman, 2014).

Smart inventory purchasing: A key responsibility of every inventory purchasing team is to negotiate the best price for the items they reorder, so that the sell-on price is as profitable as possible. But striving for the cheapest unit price isn't always the most cost-effective way to procure a product (Chapman, 2014).

2.3.1.2 Profitability

Profitability is the primary goal of all business ventures. Without profitability the business will not survive in the long run. So measuring current and past profitability and projecting future profitability is very important. Profitability is measured with income and expenses. Income is money generated from the activities of the business. For example, if crops and livestock are produced and sold, income is generated. However, money coming into the business from activities like borrowing money do not create income. This is simply a cash transaction between the business and the lender to generate cash for operating the business or buying assets (Johanns, 2017).

The best measure of a company is its profitability, for without it, it cannot grow, and if it doesn't grow, then its stock will trend downward. Increasing profits are the best indication that a company can pay dividends and that the share price will trend upward. Creditors will loan money at a cheaper rate to a profitable company than to an unprofitable one; consequently, profitable companies can use leverage to increase stockholders' equity even more. The common profitability measures are return on assets and return on equity (Albertazzi & Gambacorta, 2009).

2.3.1.2.1 Net profit margin

Net profit margin is the percentage of revenue remaining after all operating expenses, interest, taxes and preferred stock dividends (but not common stock dividends) have been deducted from a company's total revenue. The net profit margin is equal to how much net income or profit is generated as a percentage of revenue. Net profit margin is the ratio of net profits to revenues for a company or business segment. Net profit margin is typically expressed as

a percentage but can also be represented in decimal form. The net profit margin illustrates how much of each dollar in revenue collected by a company translates into profit (Chris, 2019).

Net profit margin is one of the most important indicators of a company's financial health. By tracking increases and decreases in its net profit margin, a company can assess whether current practices are working and forecast profits based on revenues. Because companies express net profit margin as a percentage rather than a dollar amount, it is possible to compare the profitability of two or more businesses regardless of size (Carlson, 2019).

Investors can assess if a company's management is generating enough profit from its sales and whether operating costs and overhead costs are being contained. For example, a company can have growing revenue, but if its operating costs are increasing at a faster rate than revenue, its net profit margin will shrink. Ideally, investors want to see a track record of expanding margins meaning that net profit margin is rising over time. Most publicly traded companies report their net profit margins both quarterly during earnings releases and in their annual reports. Companies that can expand their net margins over time are generally rewarded with share price growth, as share price growth is typically highly correlated earnings growth (Murphy, 2019).

$(\text{Net profits} \div \text{Net sales}) \times 100 = \text{Net profit margin}$

This measurement is typically made for a standard reporting period, such as a month, quarter, or year, and is included in the income statement of the reporting entity. The net profit margin is intended to be a measure of the overall success of a business. A high net profit margin indicates that a business is pricing its products correctly and is exercising good cost control. It is useful for comparing the results of businesses within the same industry, since they are all subject to the same business environment and customer base, and may have approximately the same cost structures (Bragg, 2019).

Generally, a net profit margin in excess of 10% is considered excellent, though it depends on the industry and the structure of the business. When used in concert with the gross profit margin, you can

analyze the amount of total expenses associated with selling, general, and administrative expenses (which are located on the income statement between the gross margin and the net profit line items) (Downes & Goodman, 2015).

Example of Net Profit Margin

ABC International has a net profit of \$20,000 in its most recent month of operations. During that time, it had sales of \$160,000. Thus, its net profit margin is: $(\$20,000 \text{ net profit} \div \$160,000 \text{ net sales}) \times 100 = 12.5\%$ net profit margin in this example, business would have a net profit margin of 12.5%. In other words, 12.5% of the total sales revenue is profit. Companies that generate greater profit per dollar of sales are more efficient. Companies with high net profit margin ratios are also better able to survive a product line that doesn't meet expectations or a period of economic contraction.

2.3.1.2.2 Return on assets

Return on assets (ROA) is a financial ratio that shows the percentage of profit a company earns in relation to its overall resources. It is commonly defined as net income divided by total assets. Net income is derived from the income statement of the company and is the profit after taxes. The assets are read from the balance sheet and include cash and cash-equivalent items such as receivables, inventories, land, capital equipment as depreciated, and the value of intellectual property such as patents. Companies that have been acquired may also have a category called "good will" representing the extra money paid for the company over and above its actual book value at the time of acquisition. Because assets will tend to have swings over time, an average of assets over the period to be measured should be used. Thus, the ROA for a quarter should be based on net income for the quarter divided by average assets in that quarter. ROA is a ratio but usually presented as a percentage (Albrecht, James, Earl, & Swain, 2015).

ROA is used internally by companies to track asset-use over time, to monitor the company's performance in light of industry performance, and to look at different operations or divisions by comparing them one to the other. For this to be accomplished effectively, however, accounting systems must be in

place to allocate assets accurately to different operations. ROA can signal both effective use of assets as well as under-capitalization. If the ROA begins to grow in relation to the industries as a whole, and management cannot pinpoint the unique efficiencies that produce the profitability, the favorable signal may be negative: investment in new equipment may be overdue (Baker, Benrud, & Powell, 2015).

Another common internal use for ROA involves evaluating the benefits of investing in a new system versus expanding a current operation. The best choice will ideally increase productivity and income as well as reduce asset costs, resulting in an improved ROA ratio. For example, say that a small manufacturing company with a current sales volume of Frw 50,000, average assets of Frw 30,000, and a net profit of Frw 6,000 (giving it an ROA of Frw 6,000 / Frw30, 000 or 20 percent) must decide whether to improve its current inventory management system or install a new one. Expanding the current system would allow an increase in sales volume to Frw 65,000 and in net profit to Frw7, 800, but would also increase average assets to Frw39, 000. Although sales would increase, the ROA of this option would be the same-; 20 percent. On the other hand, installing a new system would increase sales to Frw 70,000 and net profit to Frw 12,250. Because the new system would allow the company to manage its inventory more efficiently, the average assets would increase only to Frw 35,000. As a result, the ROA for this option would increase to 35 percent, meaning that the company should choose to install the new system (Baker, Benrud, & Powell, 2015).

The formula to calculate return on assets is:

$$\text{ROA} = \frac{\text{Annual Net Income}}{\text{Average Total Assets}}$$

A company's return on assets (ROA) is calculated as the ratio of its net income in a given period to the total value of its assets. For instance, if a company has Frw10,000 in total assets and generates Frw2,000 in net income, its ROA would be Frw2,000 / Frw10,000 = 0.2 or 20%.

2.3.1.2.3 Return on equity

Return on equity (ROE) is the amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested (Christopher, 2014).

According to Garcia (2008), Return on Equity (ROE) is one of the most important indices for assessing a company's performance. It describes how effectively the company uses owner or shareholder equity to generate income. This equity may be invested directly into the company by a partner, or it may be invested through stock purchases. ROE is calculated using this and equity along with income, both of which may be found in a company's balance sheet.

ROE is expressed as a percentage and calculated as:

$$\text{Return on Equity} = \text{Net Income/Shareholder's Equity}$$

Net income is the after-tax income whereas average shareholders' equity is calculated by dividing the sum of shareholders' equity at the beginning and at the end of the year by 2. The net income figure is obtained from income statement and the shareholders' equity is found on balance sheet. You will need year ending balance sheets of two consecutive financial years to find average shareholders' equity (Loth, 2016).

Return on equity is an important measure of the profitability of a company. Higher values are generally favorable meaning that the company is efficient in generating income on new investment. Investors should compare the ROE of different companies and also check the trend in ROE over time. However, relying solely on ROE for investment decisions is not safe. It can be artificially influenced by the management, for example, when debt financing is used to reduce share capital there will be an increase in ROE even if income remains constant (Jan, 2012).

Example: Company A earned net income of Frw1,722,000 during the year ending march 31, 2011. The shareholders' equity on April 30, 2010 and March 31, 2011 was Frw14, 587,000 and

Frw16,332,000 respectively. Calculate its return on equity for the year ending March 31, 2011.

Solution

$$\text{Average Shareholders' Equity} = (\text{Frw}14,587,000 + \text{Frw}16,332,000) / 2 = \text{Frw}15,409,500$$

$$\text{Return on Equity} = \text{Frw}1,722,000 / \text{Frw}15,409,500 \approx 0.11 \text{ or } 11\%$$

2.4. Conceptual Framework

Conceptual framework depicts the relationship that exists between study variables. The independent variable for the study will be inventory control measured through buffer stocks, lead time, and replenishment of stocks while the dependent variable will be profitability. Figure 2.1 shows conceptual framework.

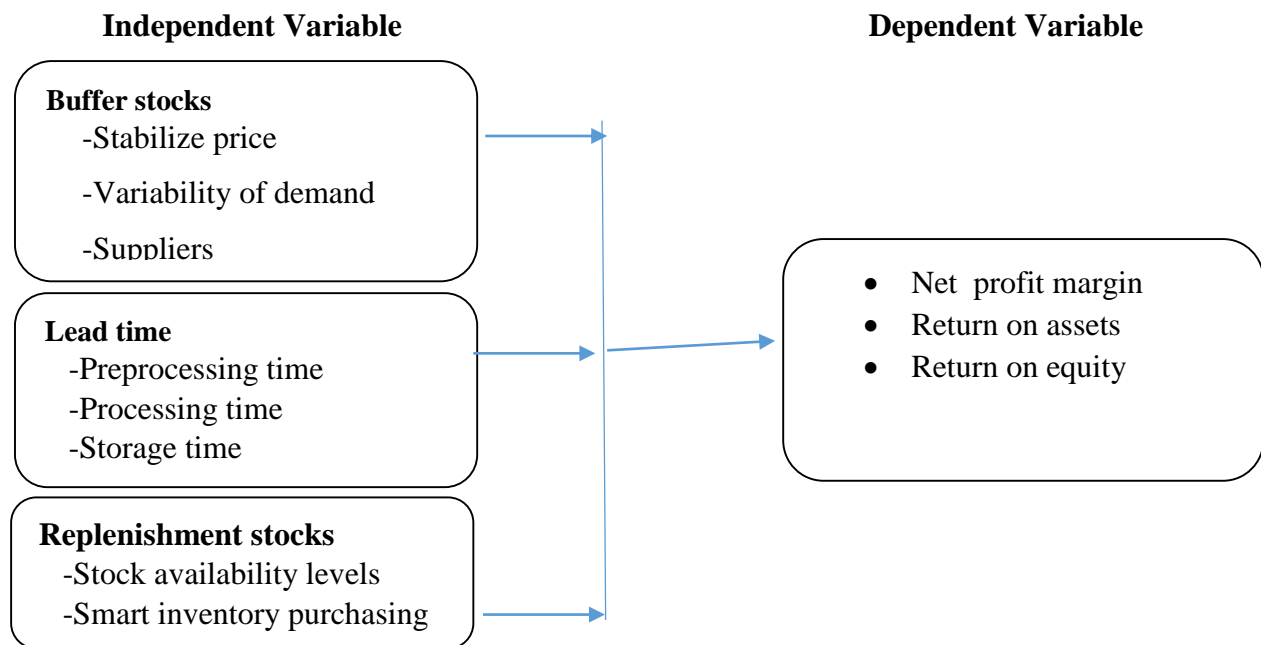


Figure 1. Conceptual framework

Source: Research compilation, 2020

2.5. Research gap

This study was conducted to study the inventory control and its impact on profitability particularly in Skol Brewery Ltd. Even though similar studies have been conducted in foreign countries, no other available study has been conducted in Rwanda. This has created scarcity of academic knowledge in the field of inventory control and profitability. This study is aimed at closing this academic gap by conducting the study on the local context to avail academicians and scholars with local content on inventory control and its impact on profitability. The current study tries to close this academic gap by focusing on the inventory control (buffer stocks, lead time, and replenishment stocks) and profitability especially when subjected with other factors such as net profit margin, return on assets, and return on equity.

3. Research Methodology

Research Design

A research design is a framework or a plan for the study used as a guide in collecting and analyzing

data. It is a blueprint that is followed in completing a study. A research design as a plan of action, for the purposes of this study (Churchill, 1992). This research used quantitative research design contains with descriptive research design. Descriptive research is research used to “describe” a situation, subject, behavior, or phenomenon. Descriptive studies are often described as studies that are concerned with finding out “what is”. It attempts to gather quantifiable information that can be used to statistically analyze a target audience or a particular subject. Description research was used to observe and describe a research subject or problem without influencing or manipulating the variables in any way.

This approach was appropriated for the study since the study sought to identify empirically the prevailing the impact of inventory control on profitability in Skol Brewery Ltd to act as a predictor of the situation manufacturing industry in Rwanda. The independent variable of study is inventory control while the dependent variable in this study is profitability.

Target population

Target population is the totality of all elements, subjects, or members that possess a specified set of one more common characteristic. Population is the entire set of individuals of interest to a researcher (Pamela, 2006). Population is the full set of elements or people from which you are sampling, or is the complete set of individuals, objects or measurement having some common observable characteristics

Table 1: Population and sample size

Departments	Numbers
Human resource Manager	1
Finance	1
Sales Marketing	1
Production	1
Operations	1
Commercial	1
Logistics	22
Supply chain	1
IT	1
Total	30

Source: Skol Brewery Ltd (2020)

Sample size

The sample size is an important feature of any empirical study in which the goal is to make deduction about a population from a sample (Pamela, 2016). Since the total target population size is small, the researcher considered the whole population as her sample size. Therefore, it is no need of determining sample size in order to achieve accuracy and for the research data collection; the researcher was distributing the questionnaire to all respondents.

4. Summary of Findings

In this chapter has analyzed the data collected and discussed based on impact of inventory control on profitability. The research objective of this study is to study the impact of inventory control on profitability particularly in Skol Brewery Ltd. In this research descriptive statistic for analyzing the data obtain from respondent and table was used to make interpretation. The respondents were 30 employees from logistic department and head of other different departments of Skol Brewery Ltd. All answers received from questionnaire were analyzed during the research process.

The role of buffer stock (stabilize price, variability of demand, and suppliers) on profitability of Skol Brewery Ltd

The analysis of the results showed that: Skol Brewery Ltd use buffer stocks for stabilizing the

(Larry, 2011). The “population” in statistics includes all members of a defined group that we are studying or collecting information for data driven decisions. Although the entire population usually does not participate in a research study, the result from the study could be generalized to the whole population. The target population in this research study was 30 employees from logistic department and head of other different departments of Skol Brewery Ltd.

price of its products with the mean of 3.56 (strong) and standard deviation of 0.43 (homogeneous); Skol Brewery Ltd take measures to avoid the risk of the variability of demand and it was perceived by the mean of 3.46 (tend to strong) and the standard deviation of 0.57 (heterogeneous). And also the assessment showed that Skol Brewery Ltd has defined the levels of inventories for raw materials and it was perceived by the mean of 3.49 (tend to strong) and the standard deviation of 0.42 (homogeneous).

In general, all items assessed have scored with the aggregate mean of 3.50 (strong) which means that the employees of Skol Brewery Ltd Rwanda agreed that buffer stock has the role to the profitability of Skol Brewery Ltd by stabilize price, variability of demand, and suppliers.

The effect of lead time (preprocessing time, processing time, and storage time) on the profitability of Skol Brewery Ltd

The study showed that the following: the processing time of Skol Brewery Ltd Rwanda affects profits position of the company and it was perceived by the mean of 3.88 (strong) and the standard deviation of 0.12 (homogeneous); the storage time favor the profitability of Skol Brewery Ltd Rwanda and it was perceived by the mean of 3.29 (tend to strong) and the standard deviation of 0.53 (heterogeneous).

In general, all items assessed have scored with the aggregate mean of 3.61 (strong) which means that the employees of Skol Brewery Ltd Rwanda agreed that lead time has the effect to the profitability of Skol Brewery Ltd through fair preprocessing time, processing time, and storage time.

The impact of replenishment of stock (stock availability levels and smart inventory purchasing) on the profitability of Skol Brewery Ltd

They were disagreement among respondents that there are always stock availability levels at Skol Brewery Ltd and was perceived with tend to weak mean of 2.48 (tend to weak) and standard deviation of 0.62 (heterogeneous). The study found that the inventory purchasing teams at Skol Brewery Ltd Rwanda are able to negotiate the best price for the items they reorder, and it was perceived by the mean of 3.55 (strong) and the standard deviation of 0.49 (homogeneous). In general, all items assessed have scored with the aggregate mean of 3.02 (tend to strong) which means that the employees of Skol Brewery Ltd agreed that replenishment of stock has the impact to the profitability of Skol Brewery Ltd through stock availability levels and smart inventory purchasing.

5. Conclusion

Based on the study findings; the researcher acknowledged that inventory control is necessary because enough inventory is needed to minimize the rate of stock-outs in any firm. In setting inventory level, firms should consider the costs such as ordering costs, holding cost and stock-out costs. Ordering costs relates to costs incurred in placing and receiving an order for the supply of inventory. Ordering cost includes purchasing department personnel expenses, communication and paperwork, inspections, insurance and other related costs. The factors of inventory control that impact profitability the most, as well as least. Inventory represents an important decision variable at all stages of product manufacturing, distribution and sales, in addition to being a major portion of current assets of many organizations. Too much and too low inventories bring down the level of profitability of an organization. Challenges striking a balance between overstocking and running out of store and underproduction stoppages, ineffective stock management can lead to inadequate holding of stock, resulting inability to meet customers demand as at when due and loss of goodwill lead to drain in the resources of the company. Inventory control has the

purpose of getting the right inventory at the right place in the right time with right quantity because it is directly connected with the production.

6. Recommendation

Based on the findings of the study, it was therefore recommended that;

1. Skol Brewery Ltd should make sure the storage cost of the available or left-over stock be maintained at a reasonable level of cost so has not to draw the cumbersome quota on the profit realized and cost of sales have to be at minimal so has not to expend the profit before making it.
2. Skol Brewery Ltd should take upon themselves to allow stock availability in the warehouse, so must make conversion easy due to demand and output emergency.
3. Skol Brewery Ltd that should be given more priority that the storage cost of warehousing the raw materials.

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