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Inventory management effectiveness of a manufacturing company – Malaysian evidence

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Abstract

Purpose – The purposes of this study are to examine the standard operating procedure (SOP) on inventory management practices, identify any weaknesses in inventory management and examine its impact on the performance of the company. Inventory management is important because it ensures smooth production and prevents loss of sales because of stockout and/or customer dissatisfaction.

Design/methodology/approach – This study selects one manufacturing company as a case study and uses the mixed data collection method of document analysis and observation. The research analysis was conducted by using COSO Internal Control – Integrated Frame work 2013 as guidance.

Findings – It is revealed that a company practices risky inventory management in keeping stock, as it relies heavily on third-party warehousing services beyond the control of the company. This study also reveals that the SOPs are too general and lack specificity. However, poor inventory management has a modest influence on the financial performance of the company.

Research limitations/implications – In completing this study, some limitations are experienced such as changes on the management structure of the company as well as the department itself. Frequent changes on several procedures also may influence this study to obtain accurate information. In addition, some highly confidential documents such as detailed information and minutes from management meeting were not permitted to be examined.

Practical implications – This study provides recommendations to improve weak internal controls particularly on SOPs, so that fraud and mismanagement opportunities can be reduced.

Originality/value – This study makes an original contribution, as it enhances the theoretical and practical understanding on inventory control and management systems, particularly for a manufacturing company in the emerging market environment. In addition, it examines various internal financial reports and directly observes the process in supply change management, which are generally difficult to be accessed by academic researchers.

Keywords Case study, Malaysia, Internal control, Inventory management, COSO Framework, Stock control

Paper type Case study

Introduction

Inventory or stock is one of the most important and difficult assets in a statement of financial position (formerly known as balance sheet) that can be effectively and efficiently managed by a company, irrespective of its size, whether a large corporation or small or

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medium enterprises (Elsayed and Wahba, 2013). This is because inventory, and its related handling process require significant investment, particularly in sophisticated and modern systems, which remain fixed for a considerable time (Dennis and Meredith, 2000). For example, enterprise resource planning can be used to integrate all systems in a company, including inventory management. It can identify any potential of cost overruns and immediately alert the managers (Suhaimi *et al.*, 2016). However, this technology is typically expensive and complex.

Failure of inventory management in any company may lead to the increase in the amount of losses, which can affect a company's financial performance. It can be detected from the increasing number of stock losses during cycle count activity at the financial year end. Therefore, further investigation is needed to determine the root cause of the problem. If there is no action taken for improvement, it will create many loopholes in internal control that can lead to bigger risks of theft and fraud schemes (Skaife *et al.*, 2013; Omar *et al.*, 2016; Zakaria *et al.*, 2016) and waste of resources (Rahim *et al.*, 2016).

Capkun *et al.* (2009) posit that fewer studies were carried out to examine the relationship between the inventory performance of the discrete components on inventory, which are finished goods, raw materials, packaging materials and work in progress with financial performance. Usually, stakeholders will refer to a financial statement to measure a company's performance. Thus, they want to know the factors that can contribute to the figures stated in the financial statement, including inventory.

Inventory control is one of the factors that may affect company performance alongside macroeconomic-, industry-, and firm-specific factors such as ownership structure, human capital, good governance practices, high work ethics, strategic direction, effective board and innovation (Ahmad *et al.*, 2016; Husnin *et al.*, 2016; Khadijah *et al.*, 2015; Asmuni *et al.*, 2015; Hashim *et al.*, 2014; Jaafar *et al*, 2014; Manan *et al.*, 2013; Husnin *et al.*, 2013; Hamid *et al.*, 2011; Koumanakos, 2008; Himmelberg *et al.*, 1999; Bart and Baetz, 1998; Eisenberg *et al.*, 1998; Hall, 1993). However, many companies have problems in managing their inventory, which may deteriorate financial performance, either as a manufacturer or distributor. For example, companies will only realize that they incur losses because of missing inventory after the year-end stock count in which there are differences between the physical stock and system records. This inaccuracy of inventory records can lead to the reduction of profit of the company (Chuang and Oliva, 2015) and may be too late to be prevented.

Fraud also can result in missing inventory. Albrecht *et al.* (2011) suggest that inventory fraud has been a significant problem for business. This is consistent with a survey conducted by KPMG (2009), which found that theft of inventory recorded the second-highest type of fraud incurred by Malaysian companies at 31 per cent, just behind theft of cash at 39 per cent of overall types of fraud perpetrated. PricewaterhouseCoopers Malaysia (2016) also found that asset misappropriation was the most common economic crime reported at 57 per cent, whereas procurement fraud was 17 per cent.

Another problem faced by companies is the delivery of goods to the customer and third-party warehouse. Lack of communication between departments also can lead to the failure of inventory management. For instance, the supply chain department does not inform the plant and operations department on the status or balance of stock available for raw materials. When an urgent order needs to be produced and raw materials are required, it will affect the production process, and the customer cannot receive the goods as per their request on time. Fluctuation in price also is one of the main problems in managing inventory and requires attention from all parties involved. This situation will affect the company's performance because customers will not hesitate to find other manufacturers and suppliers.

In contrast, good inventory management will increase a company's performance. Koumanakos (2008), for example, found that industrial sectors in Greece that manufacture food, textiles and chemicals and demonstrate effective inventory management arising from lean operations show higher rate of returns and superior financial performance. When inventory is well managed, associated costs of inventory such as storage costs, insurance costs, ordering costs, obsolete stock and other related costs will be at the optimal level (Samad *et al.*, 2006).

Based on this situation, it is interesting to study the condition and influence of a company's inventory management. Specifically, the purposes of this study are, first, to examine the effectiveness of standard operating procedures (SOPs) on a company's inventory management; second, to identify any loopholes in practices and procedures on a company's inventory management; and, third, to investigate the impact of inventory management on company performance. One manufacturing company was selected as a case study, whereas COSO Internal Control – Integrated Framework 2013 was used to assess effectiveness of practices and procedures in inventory management.

This study makes original contributions in several ways. First, the current management situation in the supply chain department for a selected company is weak. Many losses are incurred because of ineffectiveness of this department. Thus, this study will assist in the proper restructuring of the process and procedures that need to be done to improve this department as well as organization performance as a whole. Second, with the lack of staff in this department, this study will help personnel to obtain richer information and improve SOPs based on information and recommendations in this study. Finally, this study will add to the body of the literature on the problems and possible solutions of the weaknesses in inventory control systems, which is a dearth in the literature, particularly as the study used a case study approach in a company operating in a developing country such as Malaysia. As this study use COSO Framework 2013 as a basis of its analysis, it is hoped that this paper will enhance the theoretical understanding on the inventory control and management systems.

The remainder of this paper is structured as follows. Section 2 provides the literature review, followed by research methodology. Section 4 discusses the results and findings of the research. Section 5 contains conclusions and the final section contains limitation and suggestion for future research.

Literature review

Inventory management

The word "inventory" is defined in many ways in the literature. In general, inventories are the stocks of raw materials, packaging materials, work in process and finished goods that appear in numerous points throughout the company's production and logistic channel (Ballou, 2005). Pycraft *et al.* (2010) defined inventory as the stored accumulation of material resources in a transformation system, whereas Chase *et al.* (2006) described inventory as the stock of any item or resources used in an organization.

Essentially, inventory management can be best explained as a set of policies, procedures and controls that systematically monitor and observe inventory levels and intelligently determine at what levels the inventory should be maintained, what time should the inventory be replenished and how large of an inventory quantity should be ordered. It is a continuing process of planning, organizing and controlling inventory that aims to minimize the investment in inventory while at the same time balancing supply and demand (West, 2009).

Three common types of inventory are presented in a statement of financial position: finished goods, raw materials, and work in progress. Finished goods refer to those goods manufactured by a business, completed and ready for sale. They are consumable goods sold

by the firm to wholesalers, retailers and potential customers. Raw materials are items acquired by purchase, exploitation of natural resources or growth for the purpose of processing into finished goods. They flow into work in progress, then, when processing is completed, to finished goods. For instant, for a manufacturer of lubricant products, base oil and additives are blended together to create lubricant formulas. Work in progress refers to goods in the process of being manufactured but not yet completed as finished goods by the end of the accounting period. This uncompleted production is carried forward to the next accounting period. Work in progress values the cost of labor, materials and overhead incurred to that level of completion.

Cheung *et al.* (2004) argued that, for a business entity, the profitability depends heavily on the effectiveness of the inventory management via reduction of stock-handling cost and proper streamline of the production process. This is supported by Shin *et al.* (2015), who found that US manufacturing firms that recorded lower ratios of inventory to sales have higher profit margins. In addition, small firms benefit more than larger firms from increased inventory efficiency. The authors' results confirm the conclusion presented by Mittal *et al.* (2014) who earlier found that fertilizer companies in India have a higher average inventory conversion period, which indicates slow stock movement, and also recorded inferior profitability figures. This empirically proved that good inventory management does encourage positive results of the company. Talavera *et al.* (2015), for example, found that the average time to manually search for a finished product was 15.5 min, which is significant. However, by using better inventory management control devices such as radio-frequency identification (RFID) technology, search times can be reduced, hence saving labor costs.

Inventory management can be improved in several ways. Some of the popular methods and techniques that attract many empirical research and findings, as suggested by Williams and Tokar (2008), include implementing a periodic review system (Ballou, 2005; Blumenfeld *et al.*, 1985; Hsu and El-Najdawi, 1991; Sezen, 2006), use of technology such as RFID (Fan *et al.*, 2015; Talavera *et al.*, 2015), centralization of stocking locations (Zinn *et al.*, 1989; Evers and Beier, 1993; Tallon, 1993), appropriate adapted inventory control policy (Fu *et al.*, 2015) and integrating warehousing with an inventory control system (Evers, 1999; Waller *et al.*, 2006; Mason *et al.*, 2003; Thomas and Tyworth, 2006). In addition, other factors such as employee training, positive management attitude, supplier empowerment, active interactions with customers and purchasing are also vital in improving inventory management performance (Pillai, 2014).

Inventory costs

In managing inventory, several costs must be considered in determining optimum inventory levels. Owoeye *et al.* (2014) concurred that the cost of purchasing and holding inventory can account for as much as 60 to 80 per cent of the total cost of a product or service. According to Gourdin (2005), three types of costs must be considered: holding, ordering and stockout cost.

Holding or carrying cost. Holding costs include storage, insurance, taxes, obsolescence, theft and interest on funds or borrowing in financing the goods. These costs increase as inventory level rises. To minimize the carrying cost, management typically makes frequent orders of small quantities. Holding cost commonly assesses a percentage of a unit rather than attempting to express it as monetary value for each cost individually. This practice is a reflection of the difficulty inherent in quantifying a specific per unit cost like obsolescence cost.

Ordering cost. Ordering cost are costs associated with placing an order. It includes expenditures related to workforce and personnel in a purchasing or procurement department, communication expenses such as telephone, mail and internet and other money

spent to handle the related paperwork. Lowering these costs would be accomplished by placing a small number of orders by large quantity. Unlike holding costs, ordering costs are generally expressed as a monetary value per order.

Stockout cost. Stockout costs include sales that are lost, both short and long term, because of inability of the company to fulfill the customer's order. The customer may switch to the competitors to buy their products temporarily or permanently, which may result in loss of valuable revenue. This cost is probably the most difficult cost to compute but arguably the most important because it represents the cost incurred by customers (internal or external) when inventory policies falter. Failure to understand these costs can lead management to maintain higher or lower inventory levels than customer requirements may justify. Ali and Asif (2012) suggest that an effective inventory management system can reduce the risk of short inventories, which decreases the cost of lost customers. It also indirectly minimizes the risk of dissatisfaction of customers.

Impact of the inventory management to the performance of the company

The most common tool used to analyze the financial performance of the company is the financial ratio. Financial ratio analysis helps to determine the company position within an industry sector and comparing prior years' performance. Basically, company performance can be measured by analyzing its financial statements. Prior studies by Koumanakos (2008), Huson and Nanda (1995); Deloof (2003); Boute *et al.* (2004); Shin and Soenen (1998); Chen *et al.* (2005); Blazenko and Vandezande (2003); Vastag and Whybark (2005); Demeter (2003); Tunc and Gupta (1993) and Voulgaris *et al.* (2000) also used ratio analysis as a proxy of inventory management practices to evaluate corporate performances. Ratios can be classified into three broad categories, specifically, liquidity, turnover and profitability.

Liquidity ratios. This ratio is used to determine a business's ability to repay its short-term creditors out of its total cash (Brigham and Ehrhardt, 2013). The higher of the value, the better it is for the company, which means the company can pay the debt within the period. There are two types of ratios under liquidity: current ratio and acid test ratio. Current ratio measures a company's ability to pay short-term debt (current liability), such as accounts payable and short-term loans, using short-term assets (current asset) such as inventories and accounts receivable. An acid test ratio determines if the company has enough short-term assets to repay its short-term liability without selling its inventory. An acid test ratio is also known as a quick ratio.

Turnover ratios. Usually, turnover ratios relate to inventory turnover and receivable turnover days. Inventory turnover measures the number of times a company's inventory is sold and replaced within the period. This ratio is usually used to compare the company's ratio against the industry average. A low turnover is usually a bad sign because products tend to deteriorate as they sit in the warehouse. It can be interpreted as low sales or high inventories (Brigham and Ehrhardt, 2013).

Profitability ratios. Profitability ratio measures a company's performance and provides the indicators of the ability to generate profit (Brigham and Ehrhardt, 2013). The profitability ratio is usually used by investors to evaluate the return on their investment. Several ratios classified under profitability ratios are gross profit margin and net profit margin. Gross profit margins show the percentage of sales after deducting the cost of goods sold and can determine whether the company still has enough funds to cover other expenses such as promotion, personnel expenses and general and administration expenses. It also can determine the efficiency of the production process and inventory management. For a manufacturing company, the cost of inventory management is incurred in the total cost of

goods sold such as provision for stock obsolescence. Meanwhile, net profit margin shows the percentage of company's sales revenue after deducting all costs incurred in the account.

Theoretical framework

This research used COSO Internal Control – Integrated Framework 2013 as guidance to evaluate the procedure and practices of the inventory management in the selected company. This framework is chosen because this framework arguably is the most popular and widely applied by many types of corporations around the world. The Securities Commission of the USA also recommends that companies use this framework, as little else is widely available and applicable (Cendrowski and Mair, 2009). In addition, this framework has been in existence for more than 20 years (since 1994), showing its credentials and relevance throughout the period.

This framework consists of 5 integrated components (control environment, risk assessment, control activities, information and communication and monitoring activities), 17 underlying principles and 77 point of focus (POF). This framework guides all levels of management in designing and implementing internal controls and evaluating its effectiveness in the organization. It suggests a complete and strong internal control because, without proper internal control, an organization is prone to errors and being exposed to fraud and malpractices. This paper, however, only explains the relevant POFs related to the findings of the research.

Research methodology

Data for this study were collected from primary and secondary resources. Different types of data collection ensure that the outcomes and evidence from the findings are more credible (Eisner, 1991), hence preventing bias and wrong conclusions because of inaccurate evidence (Bowen, 2009). It also enhances the validity and reliability of the results.

Primary data were collected through observation on the process in supply chain management (SCM), which involves transferring of finished goods from SCM to a third-party warehouse, receiving of finished goods from production and receiving and transferring of raw materials. The SCM department is one of the most important departments in a manufacturing company. The purpose of this department is to manage the inventory from the early stage until the delivery of goods to the customer. This department needs to support sales departments and production sites. Therefore, SCM must have a proper inventory planning system to fulfill requirements from internal staff or outsider such as the customer.

Secondary data were collected from the financial reports and reports of stock losses in the company from 2008 to 2012. In addition, content analysis of the documents on the effectiveness of inventory management also was studied to obtain more information. These data were collected from various documentation related with inventory and rarely accessed by the outsiders because of their confidentiality. Data also were collected from the SOP provided by the company as well as its financial statements.

After the data collection stages were finished, the information gathered was interpreted and analyzed in the three steps: data reduction, data display and data conclusion. These steps were proposed by Malhotra (2010) to analyze qualitative information. In the first step, the most crucial data were selected, whereas non-important data were removed. The similar themes or subject matters were developed and examined. In the second step, visuals and diagrams were used to note if there was any pattern, relationship or trend among the themes or subject matter. Finally, in the third step, the significance of the themes or subject matters was carefully analyzed.

Background of the case

The company selected as a case in this study is a manufacturing and distributing company (later known in this study as ABC Sdn Bhd). This company was selected because its management gave permission for research to be conducted on its premises and allowed appropriate access to the documents and observation of the operation conducted in the company, which is usually difficult to obtain from other companies.

The case study approach was selected because it permits examination of rich information and analysis. Furthermore, the research effort can be focused on only a few subjects, that is, in this context one manufacturing company. Smith (2015) encouraged researchers to use this approach if there is an opportunity to investigate real settings and actual practices, which will give more accurate results. Furthermore, the researcher also is able to collect data and gain an in-depth understanding of events in real-world contexts (Bromley, 1986).

The company name was kept secret because of confidentiality. The company is a subsidiary to one of the government-linked companies in Malaysia. The company's activity related to manufacturing and distribution of lubricant products in Malaysia as well as elsewhere in Asia. Products manufactured by ABC Sdn Bhd include passenger car motor oil, diesel engine oil, motorcycle oil, gear and transmission oil, industries and marine oil and specialty products. Besides that, two other companies are related to ABC Sdn Bhd. Both companies are distributors for specific products that are manufactured by ABC Sdn Bhd. The companies are CDE Sdn Bhd and XYZ Sdn Bhd. This study, however, will only concentrate on ABC Sdn Bhd.

Findings and discussions

Standard operating procedures on the inventory management practices

The SOP is important for controlling company processes. SOP assists management to mitigate risks and achieve the company objectives (Committee of Sponsoring Organizations of the Treadway Commission, 2015). This SOP is also needed for all subsidiaries to ensure all the procedures follow the requirement stated by the holding company. Usually, a holding company will provide general SOP such as inventory write-off and the procedures that need to be followed. For instance, if the subsidiaries want to write off the inventory, they must go through audit committee process for approval. Therefore, the subsidiary companies need to establish their own SOP. Different organizations will have different SOPs. Sometimes small and medium enterprises do not address the SOP except for several important procedures. In a large corporation, SOP is important for controlling purposes and to maintain good performance of the company.

This study observed that the SOPs were kept by personnel in every respective department, and another copy was kept by policymakers (for instance, the administration department) for future reference. The SCM department has established five general SOPs since 2011. From examination, this study found that the SOPs were too general and only focus on five processes. This is related with *POF 48 – Establishes policies and procedures to support deployment of management's directives* and *POF – 49 – Establishes responsibility and accountability for executing policies and procedures* of the COSO Framework. Possibly, the procedure was established just to fulfill the requirement from top management.

There are several implications and risks if the SOP is too general. Lack of specificity will give the opportunity to personnel involved in this process to override the procedure. They will skip several processes, and this situation can lead to mistakes and basic errors that can affect the performance of the company. For instance, in the SOP, it was stated that the warehouse supervisor will examine goods received to determine whether the quantity is enough, the condition, whether good or poor, and the quality in terms of whether the goods

are per specifications. If the personnel are on leave, he or she will be supported by other personnel or contract worker. However, the study found that the support person requirement and his or her job descriptions were not included in the SOP.

There were also too many loopholes in the standard, which should be changed from time to time because the processes change, too. Based on the current situation, there was a standard that was not applicable because there were many changes in the current practices, violating *POF 50 – Performs in a timely manner*. Consequently, employees may perform their job not up to standards and produce low-quality products below the customers' expectations. In the long run, the customer may switch to another supplier and, hence, reduce the sales revenue of the company.

Commonly, SOP practiced in inventory management involves inbound or outbound inventory. Inbound is the process of receiving inventory either from supplier or department for manufacturing company. Outbound is the process of supplying or delivering inventory to the customer or another department in the company. However, most companies do not have an SOP that involves internal customers or requests from other departments. These types of companies do not emphasize the internal control of the inter-department movement of inventory within the company because they perceive that, if there are any discrepancies in inventory within the company, the staff still can conduct the reconciliation because it is easy to communicate and meet each other, compared with a third party or an entity outside the company. However, issues will arise as to whether the staff really and truly cooperate or just leave it to respective people and are not held accountable for their actions if something goes wrong because of their action. This is inconsistent with *POF 16 – Enforces accountability through structures*. Ideally, all types of inter-department requests and activities need to be properly documented and recorded to maintain clear visibility of the accountability for those who conduct specific company activities.

From the examination, this is what frequently occurred in ABC Sdn Bhd. There is a situation when the company does not have a proper inter-department SOP and many urgent orders need to be fulfilled. The plant department requests several raw materials to run an urgent order, for example. It will request verbally first without proper documentation and approval. Owing to the close relationship, the materials will be transferred first and the adjustment in the system will be conducted later. However, the person in charge may forget to do the adjustment in the system or overlook the transactions. Physically, the item is already used but not recorded in the system. Discrepancies between the physical and recording system will be there, and this situation can affect the financial statement, where it will be classified as stock loss or obsolescence. This is related to *POF 52 – Performs using competent personnel*. Clearly, the organization needs to revise its recruitment policies. The human resource department should conduct a proper background check and only hire employees who meet the highest standard of education, skills and knowledge as required by the job description, so that only qualified personnel are able to successfully deliver the task.

The inconsistencies of the record also have created a problem for other departments such as sales. Usually, when receiving a customer request, a sales executive places an order into the system after checking the stock in the system. However, when the warehouse assistant generates the delivery order and passes it to the store assistant, the goods may be missing or unavailable. This situation causes late delivery or back order, which risks the customer canceling the order. This situation is related to *POF 27 – Analyses internal and external factors* and *POF 29 – Estimates significance of risks identifies*. In this circumstance, the company fails to pre-determine how defects from internal activities will affect external customers. Consequently, the company also is unable to predict the financial risks as a result of those deficiencies from inside the company.

The study also found that of the five SOPs, all the standards only focus on delivering and receiving finished goods product. There are no SOPs for delivering and receiving of raw materials, such as receiving of raw materials from the supplier and transferring of raw materials to production. Again, this shortcoming is against *POF 48* and *POF 49*, as explained in previous paragraphs. Transferring of raw materials and packaging materials between the warehouses, from SCM to the manufacturing warehouse, is important to ensure that the quantity of the items is correct and enough for production use.

In the manufacturing company, raw materials are a huge component in the total inventory. In ABC Sdn Bhd, 80 per cent of inventory consists of raw materials and only 20 per cent is finished goods. Therefore, an SOP for delivering and transferring the materials is important for a manufacturing company. Five of the SOPs related to finished goods are as follows:

(1) Receiving of Finished Goods from Supplier.

(2) Delivery of Finished Goods to Customers (Third party's warehouse).

(3) Delivery of Finished Goods to Customers (Outbound).

(4) Receiving Finished Goods (Inbound).

(5) Receiving Finished Goods (Imported).

This study also discovered that there is an SOP, which is receiving finished goods (imported), that is actually describing the procedure in receiving of packaging materials from supplier. The title of the procedure should be changed to avoid misunderstandings from other personnel.

The current problem in ABC Sdn Bhd is worsening because of lack of communication between departments, contradicting *POF 55 – Captures internal and external sources of data*. This POF encourages organizations to have an efficient communication means and tools to extract superior information, so that good decision-making can be made. Arguably, communication between departments plays an important role to contribute to effective inventory management. This is because SCM is the one who manages the inventory and supplies the inventory to the production such as raw materials. SCM also supplies and delivers finished goods to the customer or end user. In daily operation, SCM frequently communicates with plant personnel to supply raw materials, procurement personnel to make an order to replenish the inventory and sales personnel to update current quantity of the goods.

Lack of communication also may cause an increase in cost of materials in a lubricant company. This can occur as a lubricant company usually buys raw materials in foreign currency. The cost may be impacted if the price fluctuates. SCM must keep on communicating with procurement to ensure procurement personnel can buy raw materials at a lower cost by hedging the price. This circumstance is related to *POF 30 – Determines how to responds to risks*. As a business environment nowadays is dynamic and moving fast, risk management tools such as enterprise risk management are beneficial for the company to mitigate and lower the impact of the various risks. As suggested by Bachman (1986), computation of optimal inventory policy without taking price fluctuations into account can give results that differ considerably from the optimal inventory policy when price changes are ignored. Beside communication, collaboration planning is also important and must be planned and sustained to be more effective.

Weaknesses in inventory management and stock replenishment

Generally, in the SCM department, there are two types of process, which are inbound (ingoing) and outbound (outgoing) inventory. For inbound inventory, the company needs to

monitor and control receiving of raw materials and packaging materials from outside suppliers and receiving of finished goods from plants in ABC Sdn Bhd. For outbound, the company needs to manage shunting the finished goods from the warehouse to a third party's warehouse and also deliver the finished goods to the customer directly. In current practice, inventory management is managed by the SCM department. There are also some finished goods managed by plant and operations.

Stock replenishment, on the other hand, includes raw materials, packaging materials and finished goods. This activity will involve various departments of ABC Sdn Bhd. This study found that the current practice of stock replenishment activities starts with sales projection from a sales department and submits the projection to SCM for analysis on the readiness of the inventory required. If the quantity is below the request, SCM will send the order to the planner in the plant and operations department. Quantities to be ordered include a quantity request from sales department and buffer stock for stock replenishment. Planners will update production schedule planning and quantity of raw materials that they need to produce the finished goods. Planners will share this information with SCM, and the person in charge in SCM will update the quantity of raw materials.

If the quantity is not enough, SCM will submit the information to the procurement department to process the purchase order and send to the supplier. The person in charge of procurement will prepare a purchase order and together with approval from top management to purchase. After the purchase order is approved, it will be sent to the supplier. Then, the supplier will release the order and send the materials to ABC Sdn Bhd to be received by SCM officers. The materials will be stored in a storage area and readied to transfer to plant or production. At this time, a warehouse officer to receive materials will receive a note from the plant to transfer requested materials according to the date requested.

A store officer will check the quantity of the product. If the product available and quantity are enough, the store officer will transfer the items to a plant. If the quantity is insufficient or the item unavailable, the process will be stopped until a new order and raw materials are ordered and received. Meanwhile, the planner will need to plan a new batch of other products to be produced according to orders.

After the production process is complete, which results in finished goods, production will send all the finished goods to SCM via delivery order because it will be classified in a different warehouse in the system. Finally, SCM will arrange the finished goods for transfer to a third-party warehouse.

From the observation, this study found that, for every new forecast of finished goods, all the raw materials must be reordered because SCM only keeps raw materials according to the production plan. In ABC Sdn Bhd, raw materials are divided into two categories: raw materials for additives and packaging materials for bottles, cartons, drums, pails and tins. There will be no stock available for packaging material for new orders. The company implemented this procedure because of lack of space in the storage warehouse to keep all the packaging materials. Raw materials are stored at a third-party warehouse. However, when the materials were taken out from supplier warehouse, they will be considered as ABC Sdn Bhd's liability. ABC Sdn Bhd will recognize it as inventory and take it into system when the materials arrive at the third-party's warehouse. By the year end, any raw materials that did not arrive at ABC Sdn Bhd will be classified as goods in transit.

This study also found that, because of lack of space, stock needs to be kept in the third-party warehouse, although the liability was recognized by the ABC Sdn Bhd. This is risky because ABC Sdn Bhd recognized assets not in its possession. If damage occurs because of fire, flood or other causes such as negligence in handling originated by the third party, ABC Sdn Bhd will bear the consequences and losses from the damage. This is not right, as the

risk is beyond control and not under the close monitoring of ABC Sdn Bhd. This contravenes with *POF 29 – Estimates significance of risks identifies*. Apparently, the company does not have a proper risk management mechanism to evaluate the impact of its decision and activities from the risk perspectives. This is not a right attitude because, if any major disaster occurs such as flood and fire, the financial catastrophe that needs to be addressed by the company will be gigantic and may put the company in danger of bankruptcy.

Financial analysis on inventory management

Financial analysis was carried out to see the effect of inventory management to the performance of the company. Several ratios were calculated such as current ratio, acid test ratio, inventory turnover, gross profit margin and net margin, as shown in Table I. This ratio involves ABC Sdn Bhd as a manufacturing company.

Table I shows that ABC Sdn Bhd is able to pay the debt, which may or may not include the inventory, except for acid test ratio in 2009. Even though in 2009, total inventory is lower compared with 2010, 2011 and 2012, the ratio is still below 1 because of lower amount in receivable. If compared with inventory turnover, it shows that, in 2009, stock rollovers about 4.5 times, equal to 81 days. Standard stock holding days in ABC Sdn Bhd is about two months or 60 days. Results in 2009 show that the holding period is about three months. Table I also shows gross profit and net margins for ABC Sdn Bhd. The result shows no significant changes in gross profit margin except for 2011. From the content analysis, gross profit in 2011 decreased from 9.9 to 6.6 per cent because of higher fluctuation base oil price in foreign currency. In this year, ABC Sdn Bhd suffered loss because of purchasing of base oil. During this time, procurement purchased the raw materials without any control because it buys material based on promotions given to the company on the particular month of the year. This situation also had an impact in increasing of storage cost because all the base oil is kept at the party warehouse. This also can increase the opportunity cost of the base oil, as a quantity of this material will be lost because of oxidation.

Conclusions

Generally, this study focuses on inventory control systems in manufacturing and lubricant companies; and this study also delves deeper into the SOP implemented by the company. This study uses a COSO Framework 2013 in focusing on the identification of any loopholes in practices and procedures on inventory management and investigates the extent of the problems that influence a company's performance. This study used content analysis and observations to gather the data to meet the objectives of the study.

This study found that an SCM department has an SOP for daily operations. The department has five SOPs: receiving of finished goods from supplier, delivery of finished goods to customer (third-party warehouse), delivery of finished goods to customer (outbound), receiving of finished goods (inbound) and receiving finished goods (imported). However, after

Ratios	2008	2009	2010	2011	2012
Current ratio	1.65	1.56	1.75	1.55	1.88
Acid test ratio	1.18	0.96	1.12	1.09	1.23
Inventory turnover	7.5×	4.5×	5.8×	6.8×	5.5×
Turnover days	49	81	63	54	66
Gross profit margin (%)	7.9	9.0	9.9	6.6	8.9
Net profit margin (%)	4.9	5.0	6.6	1.4	5.5

Table I.
Results of financial ratios for ABC Sdn Bhd

reviewing the SOP, it seems that the SOP likely focuses only on supply and delivery of finished goods, and these standards are too general and lack specificity. This study also found that the company has poor management in keeping the stock, as it relies heavily on the third-party warehousing services that are risky and beyond the control of the company. Finally, financial ratio analysis shows that the company has a modest performance and is not heavily influence by poor stock management. This result is consistent with previous studies conducted by Vastag and Whybark (2005); Demeter (2003) and Tunc and Gupta (1993), which concludes that inventory turnover, the proxy of efficient inventory management and control, does not significantly improve return on sales that denote company performance.

This study implicates that a company needs to appropriate revisions to the SOP. SOP should be prepared by the company itself and be frequently reviewed. This is because changes in the company environment make the previous SOP out of date and no longer relevant. An SOP also must be explained and understood by all department personnel. All personnel also must know the content and how to implement the procedure.

Incomplete and insufficient SOPs also will lead to weak internal control that subsequently encourages fraud and mismanagement. Therefore, the company needs to increase awareness about fraud in inventory management and improve the company's ethical culture. Fraud is the most important factor that needs to be eliminated in any company to ensure that all transactions are accurate and reliable. Only one fraud occurred in the organization during the study period and, as known by the stakeholders, will affect a company's reputation. The company must create awareness and training about fraud, along with an ethical culture to avoid any fraud schemes in the company such as theft of inventory, wrong inventory adjustment without any supporting documents and approval, collusion with other parties and others.

Limitations and suggestions for future research

This study had some limitations such as changes on company management structure as well as departmental changes. Frequent changes to several procedures also may influence this study. In addition, some highly confidential documents such as internal financial reports and detailed information and minutes from management meetings were not permitted to be accessed by management.

Future research should focus more on various types of companies or focus specifically on manufacturing companies with the lubricant product or within the industry but with a higher number of samples or companies. The research also can be conducted by using questionnaires to obtain feedback from large number of respondents, so that inferential statistics can be used to analyze the results and come out with more concrete and solid conclusions. Finally, in-depth interviews can be carried out with highly experienced people to get more detail and comprehensive information related to inventory control systems.

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