Empirical Examination Of The Association Of Inventory Conversion Period And Gross Profit Margin Of Beverage, Food And Tobacco Companies Listed In Colombo Stock Exchange

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Abstract

Inventory is a vital part of current assets mainly in manufacturing and business concerns. Huge funds are committed to inventories as to ensure smooth flow of production and to meet consumer demand. However, maintaining inventory also involves carrying or holding costs lengthways with opportunity cost. Therefore, inventory conversion period plays a crucial role in balancing the benefits and cost or disadvantages associated with holding inventory. Effective and efficient inventory conversion period goes a long way in successful running for survival of a business firm through maximizing the profit. Given the milestone contribution of the beverage food and tobacco sector firms to the economy of Sri Lanka, this research is necessary to evaluate the effects of inventory conversion period on the gross profit of the beverage food and tobacco sector firms in Sri Lanka. A panel data from 2011 to 2015 was gathered for the analysis from the annual reports of 20 beverage food and tobacco sector firms as sampled firms listed at Colombo Stock Exchange (CSE). The multiple regression model was applied in the data analysis to find out the relationship between inventory conversion period and firm’s gross profit margin. The independent variable used as inventory conversion period and gross profit margin used as dependent variable. The results provide a significant positive relationship between inventory conversion period with gross profit margin. The study recommends that the beverage food and tobacco sector firms in Sri Lanka should strive to ensure that the right stock is kept in their warehouses to run profitably through increasing the gross profit and hedge against excessive holding cost and stock-outs.

Keywords: Inventory; inventory conversion period; gross profit margin; Colombo Stock Exchange

1. Introduction

Inventory is the vital thing of the business. Because, the inventories of the business direct affect to the sales and profit of the Organization. Building on this intuition, our purpose of this present study is going to examine the relationship of inventory conversion period and gross profit margin of Beverage Food and Tobacco companies. Inventory conversion period (ICP) serves as independent variable whereas gross profit margin were used as dependent variable for the evaluation.

In general, efficient or inefficient inventory management is only one factor that may influence on profitability. In this way, a range of other macroeconomic, industry and firm-level factors are also important. Historically, the structure-conduct-performance (SCP) framework is focused as industry level variables by economists. In this present study however, in an effort to isolate the impact of inventory conversion period we are not consider other possible predictors.

Nearly all of the literature explores Cost minimization or profit maximization is the criteria for optimal inventory management. An inventory managers’ goal for example, is modeled as minimizing cost or maximizing profit while satisfying customers’ demands. If inventory decisions do not affect the revenue stream, these two criteria result in the same optimal replenishment policy.

Too much inventory consumes physical space, creates a financial burden, and increases the possibility of damage, spoilage and loss. Furthermore, excessive inventory frequently compensates for inefficient and sloppy management, haphazard scheduling, poor forecasting, and inadequate attention to the process and procedures. Conversely, too little inventory often disrupts business operations, and
increases the probability of poor customer service. In many cases good customers may become furious and take their business somewhere else if the desired product or service is not immediately available.

In the operations management literature, the question of how much inventory a firm should keep has been extensively studied even though there is a dichotomy in the views given that inventory is both an asset and a liability. In the empirical evidence of the inventory management-performance relationship also produced mixed results. Specifically, Milgrom and Roberts (1988) and Dudley and Lasserre (1989) indicated that timely and informative customer demand data can result in improved profitability through reduced inventories. Deloof (2003) documents a significant negative relation between gross operating income and the number of inventories days for a sample of non-financial Belgian firms during the period 1992-1996, suggesting that managers can create value for their shareholders by reducing the number of inventories days to a reasonable minimum. Huson and Nanda (1995) proved that the improvement of inventory turnover (following JIT adoption) by a sample of 55 firms led to an increase in earnings per share. Additional evidence from Belgium is provided by Boute et al. (2004), who found no overall decrease of inventory ratios despite any increased focus on inventory reduction and Boute et al. (2006), who concluded that companies with very high inventory ratios have more possibilities to be bad financial performers. This is consistent with the findings of Shin and Soenen (1998).

Furthermore, in a more recent study, Shah and Shin (2007) examined the empirical associations among three constructs – inventory, IT investments and financial performance – using longitudinal data that span four decades, where they conclude that reducing inventories has a significant and direct relationship with financial performance. Further, Rotemberg and Saloner (1989) reported that a commonly identified positive association between corporate inventories and sales is greater for more concentrated industries.

Given that the results from the above few empirical studies focused on the inventory conversion period and consequences of inventory conversion period are somewhat contradictory, so this study try to shed more light to this issue by employing more sophisticated statistical tests applied to a recent sample of Sri Lankan Beverage Food and Tobacco Companies.

The use of Sri Lankan evidence may lead to an assessment of the general applicability of inferences drawn from relevant research in different countries. To sort out the independent effects of inventory conversion period on the gross profit we initially utilized a linear regression model estimated by this representative sector and for each of the years 2011 to 2015 (2011/2012 to 2015/2016).

2. Problem Statement

Many of the organizations fail to scrutinize their investment in inventory is found in the quest to maximize return on investment (Sitienei and Memba, 2016). This is unfortunate because improving the way an organization controls and manages inventory may have the greatest potential for improving the organization’s bottom line (Schreibfeder, 2004). Inventory management can make potential savings to the organizations but organizations have continuously ignored it (Temeng et al., 2010). For this purpose inventory should be treated as a necessary evil and not as an asset requiring management.

Beverage Food and Tobacco is an essential sector of Sri Lanka and plays an important role in terms of its substantial contribution towards the growth in Gross Domestic Product (GDP) of the country (LKR 258,862 million in 2014), which is necessary for the country’s socioeconomic growth and development. In the year of 2014, Beverage Food and Tobacco sector also was as the most performing sector in market. Recently, there has been a growing demand of Beverage food and Tobacco from hotels and tourism development activities. The government’s industrial policy is to encourage investment in Food & Beverages industries as Sri Lanka has a comparative advantage. The Board of Investment (BOI) offers various incentives for investors. Also, Research Institutions conduct
various programs to develop R&D facilities and Government related institutions offer training and upgrade skills of the technical staff.

As such, the increased demand has increased sales for Beverage, Food and Tobacco companies but it poses a great challenge with regards to inventory and handling of these companies in the country. The rapid demand for Beverage, Food and Tobacco has augmented the inventory problem hence they need for effective and efficient inventory management. Based on this argument this study aims to analyze the association of inventory conversion period and gross profit margin of Beverage, Food and Tobacco companies listed in the Colombo Stock Exchange (CSE), Sri Lanka.

3. **Study Objectives**
   The main objective of the study is to examine the inventory conversion period relationship and impact on gross profit margin of listed companies of beverage food and tobacco sector in Sri Lanka.

4. **Research Questions**
   From this research problem and objective, the researcher is able to find out the following research questions.

   RQ1: What is the relationship between inventory conversion period and gross profit margin of listed companies of beverage food and tobacco sector in Sri Lanka?

   RQ2: Whether the inventory conversion period have an impact on gross profit margin of Sri Lankan beverage food and tobacco sector firms?

5. **Scope of the Study**
   In this study concern companies which are listed in Colombo Stock Exchange (CSE) only. The CSE has 296 companies representing 20 business sectors as at 04th May 2017. From these 20 sectors, we select only beverage food and tobacco sector for our research study and using data for a sample of 20 companies from this sector out of 21 companies for the purpose of balanced panel data. Time scope of the study covered a period of five years from 2011/2012 to 2015/2016.

6. **Significance of the Study**
   (i) The study is to help staff members of beverage food and tobacco sector firms Investments reveal the impact of inventory conversion period on the gross profit margin of beverage food and tobacco companies in Sri Lanka, and the researcher hopes that it helps the management and Technical personal to employ effective materials control techniques in order to improve on their sector firm’s works.

   (ii) The study is to add knowledge to the existing literature about inventory conversion period and impact on gross profit margin of beverage food and tobacco sector companies in Sri Lanka.

7. **Literature review**

   **Inventory conversion period (ICP)**
   ICP is the average amount of time that a business holds its inventory (Shin & Soenen, 1998).

   \[
   \text{Inventory conversion period} = \frac{\text{Average inventory} \times 365}{\text{Cost of goods sold}}
   \]

   It is the time required to obtain materials for a product, manufacture it and sell it. The inventory conversion period is essentially the time period during which a business must invest cash while it converts materials into a sale.
Impact of inventory conversion period on profitability

According to Deloof (2003) maintaining optimal inventory levels diminishes the cost of possible disruptions or of loss of business because of shortage of products, decreases supply costs, and safeguards against price fluctuations. The inventory conversion period has an inverse effect on a business’s performance. For instance, shortening the inventory conversion period could increase stock out costs of inventory which results in losing sales opportunities and leads to poor performance.

Lazaridis and Trytonidis (2005) investigated and revealed the relationship of corporate profitability and working capital management. They used a sample of 131 listed companies in the Athens Stock Exchange (ASE) data for the period of 2001 – 2004. They found a relationship that is statistical significant between profitability, the cash conversion cycle and its components for listed firms in the ASE by using regression analysis.

Deloof (2003) experienced the relationship between inventory conversion period (ICP) and corporate profitability. He used a sample of 1,009 large Belgian non-financial firms for a period of 1992 – 1996. With correlation and regression tests, he observed significant negative relationship between gross operating income and inventory turnover days of Belgian firms. Based on the study results, he recommended that managers can increase corporate profitability by decreasing the inventory turnover days. A similar study by Rehman (2007) established a strong negative relationship between inventory turnover in days and profitability of firms (Cited by Nyabwanga&Ojera, 2012).

According to previous research describe relationship between inventory conversation period and profitability. It is also affect to the inventory management. Higher inventory conversation period shows a higher profit, but it is only a nominal profit. It’s because of no any cash flow inflow to the organization. So the deepest knowledge about these criteria is essential for the business organization.Peterson and Joyce (2007) maintain that it is evident that the inventory management can make a direct contribution in increasing profitability.

Grupo (2010) stated as “Unless operators in the brewery industry understand the true costs associated with inventory management and poor inventory productivity, and can review the benefits of alternative approaches, they will continue to be inventory complacent, accepting mediocrity profit instead of stellar performance.”

Okoh, Mgbonyebi and Umeadi (2008) carried out a study on the association of inventory control in enhancing business growth in Nigeria and explored its findings as significant relationship between inventory control and business growth. It’s a survey of five selected manufacturing companies in Port Harcourt metropolis by using a simple percentage and chi-square.

Gross profit margin

It calculates the percentage of each sale to gross profit. In other words it calculates the percentage of gross profit a company is earning against its per sale. Higher value of return on sale shows the better performance (Gitman, 2002)

\[ \text{Gross profit margin} = \frac{\text{Gross Profit before Tax}}{\text{Net sales}} \times 100 \]

This ratio measured the operating success of the organization. It is mentioned about net profit relate with sales. It shows for 1 unit of sales, how much profit can be earned.

Inventory management and gross profit

Panigrahi (2013) conducted a research on relationship between inventory management and profitability. It was investigated for a sample of five top Indian cement companies over a period of ten
years from 2001-2010. This study employs regression analysis to determine the impact of ICP over GPM taking current ratio, size of the firm, financial debt ratio as control variables. The results indicate that there is a significant negative linear relationship between inventory conversion period & profitability. Here the firm size, current ratio and financial debt ratio are the variables which appear in the regression model as control variables. In the regression model it was found that, the firm’s profitability as measured by GPM has a negative relationship with financial debt ratio. This implied that profitability increases with decrease in financial debt ratio. Furthermore, in this study the relationship between the firm size and GPM was positive which indicates that profitability increases with an increase in firm size. The relationship between current ratio and the GPM was negative.

Inventory management & gross profit margin relationship can be negative or positive. It must be depend on with the type of own research. Relevant the above statement they have additional variable as control variable. So they measured GPM with financial debt ratio. Depend on one research conclusion we cannot get idea about any research. Therefore this research used GPM relate with inventory management to find out actual relationship among these two concepts.

8. Methodology

Sample and Data

This study used its source of data as financial statements, which published in the listed companies’ annual report at Colombo Stock Exchange (CSE), Sri Lanka. Mainly the data were taken from the financial statements over 5 years from 2011 to 2015. According to the CSE records 21 firms were listed under the Beverage Food and Tobacco sector since 2017, among them 20 firms’ data were taken for a balanced panel.

Variables

Inventory conversion period is the independent variable of this study and that is measured by (Average inventory/ Cost of goods sold) 365. Gross profit margin calculated the percentage of gross profit, a company is earning against its per sales as dependent variable. Many scholars have used these proxies as their studies’ variable measure previously.

Model

The fundamental advantage of a panel data set over a cross section is that it will allow the researcher great flexibility in modeling differences in behavior across individuals (Greene, 2003). This study performed the pooled model.

Analysis

Analysis was carried out in two methods of descriptive statistics method and inferential statistics method. Mainly data were collected from the annual reports by the primary survey, then sorted and analyzed by using Stata12. Tables were used for purposes of presenting and analyzing the findings of the study. Pearson correlation and regressions were used to measure the relationships and strength between the studied variables.

9. Results

Table 1 explains the descriptive statistics of both, dependent and independent variables used in the study. This critical statistics examination of the dependent and independent variables reveals a number of issues. Here the gross profit margin(GPM) is used as dependent variable measure, which varies from negative 184.94% to positive 7136% with average ratio of 1384%. So, the difference in gross profit margin ranged from profitability of 7136% (maximum value) to a loss of 184.94% (minimum value) for the Beverage Food and Tobacco firms. This explores a great disparity among the firms in their gross profit margin of the Beverage Food and Tobacco sector firms.
The average value of the Beverage Food and Tobacco sector firm’s inventory conversion period is 6360% with the rage from 1012% to 29557% for the Beverage Food and Tobacco sector firms tested, and this explores a great disparity among the Beverage Food and Tobacco sector firms in their inventory conversion period rate.

Additionally this result explores that the higher volatile variable between the examined variables is inventory conversion period with a standard deviation of 50.59704 while gross profit margin with the standard deviation of 15.53195.

Table 1: Descriptive statistics of the dependent and independent variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICP</td>
<td>100</td>
<td>63.6043</td>
<td>50.59704</td>
<td>10.12273</td>
<td>295.5786</td>
</tr>
<tr>
<td>GPM</td>
<td>100</td>
<td>13.84257</td>
<td>15.53195</td>
<td>-1.849498</td>
<td>71.36331</td>
</tr>
</tbody>
</table>

Note: ICP = inventory conversion period; GPM = gross profit margin.
Source: Results obtained from the data analysis using the statistical software package of Stata12.

Table 2: Correlation Matrix of the Variables

<table>
<thead>
<tr>
<th></th>
<th>ICP</th>
<th>GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICP</td>
<td>1.0000</td>
<td>0.5400</td>
</tr>
<tr>
<td>GPM</td>
<td>0.5400</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Note: ICP = inventory conversion period; GPM = gross profit margin.
Source: Results obtained from the data analysis using the statistical software package of Stata12.

According to the above methodology, regression analysis was performed. The following Table 3 reveals output of those estimations. Furthermore, model consisting inventory conversion period given to be significant at 5% level of confidence.

Table 3: Effect of Inventory Conversion Period on Gross Profit Margin

| Variables | Coefficient | SE   | t     | Prob.>| t | |
|-----------|-------------|------|-------|-------|-----|
| ICP       | .0497798    | .0210443 | 2.37  | 0.018 |
| Constant  | 10.67636    | 2.955969 | 3.61  | 0.000 |

Note: R² = 0.206; Adjusted R² = 0.3287; Prob > F = 0.0180
ICP = inventory conversion period; GPM = gross profit margin.
Source: Results obtained from the data analysis using the statistical software package of Stata12.

10. Discussion

The inventory conversion period effect on gross profit margin is the key objective of this study. For this purpose present study used data of 20 companies which were active in Beverage Food and Tobacco sector of CSE for the five years period from year 2011. In addition to that, inventory conversion period was considered as independent variable with dependent variable of gross profit margin.

Based on the experimental results when we see the variables as individually, inventory conversion period has a significant positive influence on gross profit margin. This positive influence expresses that firms have increasing gross profit prefer to increase their inventory conversion period.
Beverage Food and Tobacco sector of Sri Lankan firms. In other words, it can be said as the Beverage Food and Tobacco sector firms listed in CSE have higher gross profit as their inventory conversion period increases. This indicated that our model is a significant predictor (Prob> F =0.0180), which indicates that there is a positive correlation between the dependent variable (gross profit margin) and the independent variable of inventory conversion period which is used in this model.

Inventory conversion period have a significant positive relationship with the profitability measures of gross profit margin. That means if the inventory conversion period increases that will make an increase in the profitability measures of gross profit margin and vice versa.

11. Summary of the findings

This study sought to examine impact of inventory conversion period on profitability measure of gross profit margin in beverage, food and tobacco companies in Sri Lanka. The outcome of the designed model using STATA software describes the significance of the independent variable in concerned with dependent variable and how model can be used to understand the nature of relationship. The study findings established that inventory conversion period have a significant positive relationship with the profitability measures of gross profit margin.

12. Conclusion

In this present study examines the effects of inventory conversion period in gross profit margin of Sri Lankan beverage food and tobacco sector listed firms. This study employed econometric analytical tools in studying 20 Sri Lankan beverage food and tobacco sector listed firms with 100 observations for the period 2011 to 2015. Further these analyses were performed by using the panel data as it is a strong balanced panel. Table 3 explores inventory conversion period have a significant positive relationship with the profitability measures of gross profit margin (0.206*). That is statistically significant at 05% significant level.

13. Recommendation

Corresponding to the findings of this empirical study, the following appropriate recommendation is stated: Sri Lankan beverage food and tobacco sector listed firms should try to have high inventory conversation period, it can be help to make more profit (GPM and ROA).

References:-


