INTERRELATING FINANCIAL PERFORMANCE AND INVENTORY MANAGEMENT: STUDY OF INDIAN AUTOMOBILE INDUSTRY

Sourabh Kumar*[1], Amit Dutt[2]

[1,2] Mittal School of Business, Lovely Professional University, Punjab

*sharma.souravv@gmail.com, amit.dutt@lpu.co.in

ABSTRACT

Automobile industry is currently experiencing turmoil. Not only in terms of production capacity, but also in terms of the adoption of the most effective supply chain procedures, it expanded quite rapidly after deregulation. The automotive industry is experiencing a severe crisis for the first time in a very long time due to the global downturn and supply & demand mismatch in India. The paper has been accomplished with the motive of understanding the impact of several business financial performance factors on the supply chain factors of the selected companies. The major research questions are: (a) is there a significant impact of financial factors on supply chain performance of the organisation? (b) is there any significant relationship between the supply chain and financial performance of an organisation. To determine the answer to these, the Enterprise value, Net Profit Margins, Current Ratio, Operating Profit, RoCE, Inventory Conversion Period, and RoA, return on Equity and Inventory Turnover Ratios from 2010 to 2020 has been utilised from four major automobile companies of India i.e., M&M, Hero MotoCorp, Maruti Suzuki India Ltd., and Bajaj Auto Ltd. The study revealed that supply chain management has a significant impact on financial performance by boosting productivity, decreasing costs, and raising profits. This was demonstrated using a regression model based on the proposed theory. Additionally, the analysis reveals a positive correlation between the supply chain and the financial performance of some vehicle manufacturers.

Keywords: Supply chain, financial performance, ROI, ROE, ROCE, ROA, inventory.

INTRODUCTION AND BACKGROUND

Supply chain management must be a primary responsibility for every organisation involved in manufacturing (Wahdan and Emam, 2017). Inventory control is one of the most crucial aspects of supply chain administration. Inventory management and supply chain management have a lasting impact on a manufacturing plant's efficiency and output (Shi and Yu, 2013). This study aims to examine how the financial performance of the selected enterprises affects the supply network components. In the study, the following components were evaluated to determine their impact on the supply chain:

Enterprise value is, as its name indicates, the whole worth of a firm as assessed by its funding (Эшов, 2020). Included are both the cost of paying down debt and the market value of the

company's shares (net debt, or debt minus cash).

Net Profit Margins – The net profit margin, or "net margin," is the ratio of net income or profit to sales (Mulyadi and Sihabudin, 2020). It is the ratio of net earnings to sales for a company or business segment. The net profit margin can also be stated as a decimal, however percentages are more common.

Current Ratio: The current ratio gauges a company's capacity to pay its current obligations and payables with its current assets, such as cash, inventories, and receivables (Mulyadi and Sihabudin, 2020).

Operating Profit: Operating profit is the entire amount of money a firm generates from sales after deducting all expenses such as rent, employee wages, and equipment and inventory expenditures (Langemeier and Yeager, 2018). The operating profit does not account for interest, taxes, or investment gains or losses.

Return on Capital Employed is a financial metric used to determine a company's profitability and capital use efficiency (Singh and Yadav, 2013). In other words, this ratio may be used to determine how well a corporation is utilising its available funds to generate profits.

Inventory Conversion Period: This refers to the time required to acquire raw materials, manufacture a product, and sell it (Kangogo and Irungu, 2020). This is the length of time a company has to spend capital and convert raw resources into revenues.

Return on assets, often known as return on total assets, is a method for calculating a company's capital profit (Jewell and Mankin, 2011). This profitability ratio indicates the pace at which a company's assets contribute to its increased profitability.

Return on Equity (RoE) is a useful metric for determining how much money shareholders of a company's common stock get as a return on their investment (Ichsani and Suhardi, 2015). Return on equity indicates how effectively a firm is profiting from the money its owners have invested.

As independent variables, the factors listed above were utilised.

As a dependent variable, the study examined the Inventory Turnover Ratio, which indicates the frequency with which things are sold and replaced over a certain period of time (Amanda, 2019).

The study will focus on four of the world's top car manufacturers in India. Almost 7.1% of India's GDP is derived from this industry (GDP). It is also responsible for more than a quarter of the country's manufacturing GDP. The companies have been selected based on the highest market capitalisation of the sector. The financial health of these companies can be regarded as very strong, making them close to each other when talking about revenue, sales, and profits

(Kamal, 2017). The little difference in the financials will help to mark out the directives and management of the supply chain in these companies.

The company's better profitability and increased competitiveness have been connected favourably to supply chain management. These firms' operational effectiveness and profitability will be assessed in order to analyse and evaluate the link between supply chain strategy and financial success. Financial analysis has recognized that the relationship between financial variables and Inventory Turnover Ratio as an indicator of SCM is statistically significant in case of Maruti Suzuki India Ltd., Hero MotoCorp Ltd., and Bajaj Auto Ltd. The result of regression will provide the essential information about the impact of financial performance on supply chain factors of these companies (Khot and Thiagarajan, 2019). The analysis will also evaluate the areas where some mistakes resulting from erroneous calculation of inventory which could affects the financial statements, financial positions, and income statement of the company of a define period.

LITERATURE REVIEW

Inventory management and financial performance

Alrjoub & Ahmad (2017) said inventory is the array of tangible goods that a business currently possesses, according the definition. Inventory management aids the employee responsible for making appropriate judgments in recognising the inventory requirements necessary to make purchases in sufficient numbers to enable distribution and manufacturing.

Inventory management is a delicate topic and a difficult responsibility for every firm. Automobile firms' financial circumstances are largely determined by their inventory levels, which also has a substantial impact on their profitability. Because inventories compose the majority of a company's assets, they are critical to financial statements, and any errors in calculating their costs or valuing them lead to incorrect financial statement outputs.

The organisation's supply chain is helpful in more than one way. It makes sure that the organisation can put its manufacturing process into action and finish it, as well as store its resources, most of which are work in progress. In addition, it verifies that there is a constant equilibrium between the items leaving and entering the company. It also aids in reducing stock-out problems (Kumar et al. 2017). Consequently, the organisation may retain clients who may give more to rivals in the future.

Relationship between SCM and financial performance

An association has been shown between supply chain management and improved corporate performance and higher competitiveness. Using scenario analysis, Elgazzar et al. (2012) demonstrated the relationship and found that, operating efficiency and profitability were analysed and assessed to determine financial performance (assets, cost, and revenue). Short-

term financial goals can be met through increasing asset utilisation, reducing costs, and increasing income. For the supply chain operation reference model, five key SC performance factors (managing SC assets, increasing SC responsiveness, increasing SC dependability, increasing SC agility, and managing SC costs) were declared as approximating the various feasible approaches, according to the performance criteria.

Alternative scenarios	DS/AHP	Present paths	Possible outcomes
SC performance metrics (SCOR FAHP technique)		Financial performance drivers	Financial performance metrics
Improving SC reliability		Revenue	Profitability & Efficiency factor
Increasing SC responsiveness			
Increasing SC agility		Cost	Profitability factor
Managing SC costs			
Managing SC assets		Assets	Efficiency factor

Figure 1: The applied framework of the SCOR model

[Source: University of Huddersfield, 2017]

Impact of inventory management errors on financial performance

Hoberg et al. (2017) reported that most of the capital of the automobile companies is represented through their inventory, as most of these organisations calculate the inventory based on the historical costs while preparing the financial statements. There is a direct association between inventory and the cost of goods sold. Errors while calculating inventory has a direct impact on the financial statements of the company. The common reason for this error is due to careless handling of inventory data, and the second is not doing physical counting of stock by personnel. The values in the financial statement were affected because of the following examples.

First, Chang et al. (2016) discovered that inventory errors might occur at the start of every fiscal month. For example, errors in calculating net income or overstating the cost of products sold at the start of the fiscal term might occur. This will decrease the cost of products sold and increase net profitability. At the conclusion of the fiscal year, errors in inventory data will affect both the income statement and the balance sheet. Incorrectly inflated closing period values result in decreased cost of goods sold, increased equity and asset values, and increased net income values. Another problem is overstating the cost of goods sold, undervaluing assets, equity

depreciation, and low income values when inventories are depreciated at the conclusion of a fiscal year.

Close-period inventories have a significant impact on the company's financial statements since the cost of goods sold is directly influenced by the calculation of net income, which is dependent on the value of closing inventory, an important element of the assets section on the balance sheet (Zhao et al. 2015). If there is a mistake in the closing stock valuation, it will have a higher impact on the profit and loss statement for the following fiscal year since the current year's closing stock is carried over to the opening stock for next year.

Eckert (2007) examined the result of excess inventory on the stock price performance in the long term. An inventory write-off is only one example of how to deal with excess inventory in the form of a temporary closure or production curtailment, for example. According to his research, enterprises have a difficult time recovering from situations of excessive inventory.. When inventory is over or undervalued, it has an impact on the succeeding period's financial statements, financial situations, and income statement (Budagaga, 2017). As a result, the cost of products sold might be incorrectly calculated if inventory balances are incorrect. A mistake in calculating net income or gross profits can have a negative influence on the following accounting period's cost of goods sold, net income, and gross profit.
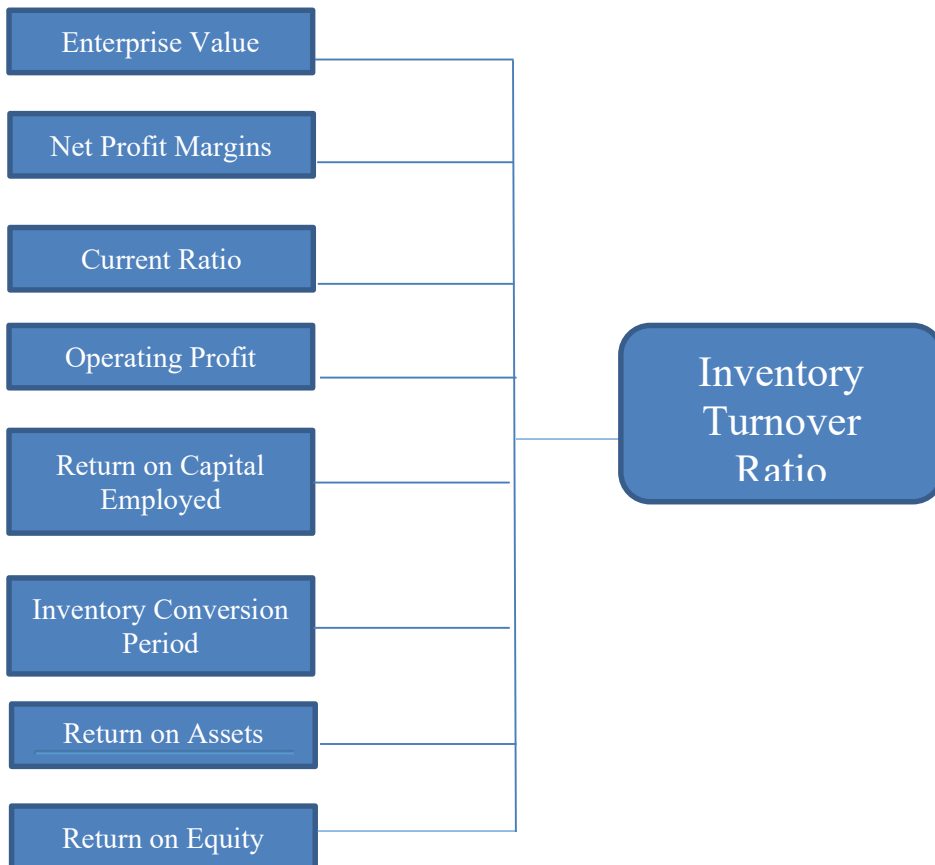
| Enterprise Value |
| Net Profit Margins |
| Current Ratio |
| Operating Profit |
| Return on Capital Employed |
| Inventory Conversion Period |
| Return on Assets |
| Return on Equity |

Inventory Turnover Ratio

Figure 2: Conceptual Framework

Based on reviewed literature, the conceptual framework has been developed. The Enterprise value (EV), Net Profit Margins (NPM), Current Ratio (CR), Operating Profit (OP), Return on Capital Employed (RoCE), Inventory Conversion Period (ICP, Return on Assets (RoA) and Return on Equity (RoE) has been taken as independent variable. The Inventory Turnover Ratio has been taken as dependent variables in study.

RESEARCH METHODOLOGY

The researcher proposes to study the various financial performance indicators and impact of these variables on supply chain of selected companies to find out the effect on enterprise value, return on capital employed, net profit margins, current ratio, operating profit, return on equity and return on assets for the period of 10 years, i.e. 2010-2020. On the above-stated basis, the following sectors and companies have been identified.

Proposed Details of companies of Automobile Sector:
- Maruti Suzuki India Ltd.
- Hero MotoCorp Ltd.
- Bajaj Auto Ltd.
- M&M Ltd.

Model Specification:

$ITR = \beta_0 + \beta_1 EV + \beta_2 NPM + \beta_3 CR + \beta_4 OP + \beta_5 RoCE + \beta_6 ICP + \beta_7 ROA + \beta_8 ROE + e$

Where, EV = Enterprise Value, NPM = Net Profit Margins, CR = Current ratio, OP = Operating Profit, RoCE = Return on Capital Employed, ICP = Inventory Conversion Period, RoA = Return on Assets and RoE = Return on Equity

ITR = Inventory Turnover Ratio,

β_0 = Intercept and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ and β_8 are the coefficient of regression

RESULTS AND DISCUSSION

To test whether Financial Performance has an impact on Supply chain management of automobile industry, data related to various financial performance indicators and supply chain management indicator has been extracted from four main automobile companies. Regression results for the above stated independent and dependent variables for the selected companies has been presented below:

Regression Results for Maruti Suzuki India Ltd.:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.997[a]	.994	.983	.51887

a. Predictors: (Constant), EV, RoE, ICP, OP, CR, RoCE, NPM, RoA

R Square indicates the amount to which the independent variables can account for the change in the dependent variable. In other words, it represents the model's explanatory capability. According to Table 1, 99.7 percent of the change in the dependent variable is attributable to independent factors.

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	184.630	8	23.079	85.721	.000[a]
	Residual	1.077	4	.269		
	Total	185.707	12			
a. Predictors: (Constant), EV, RoE, ICP, OP, CR, RoCE, NPM, RoA						
b. Dependent Variable: INVENTORY TURNOVER RATIO						

As demonstrated in the table above, how dependent and independent variables are interconnected statistically significant (p 0.05, f = 85.721) as indicated by the regression analysis results (p 0.05, f = 85.721).

Results of Regression Analysis for Mahindra & Mahindra Ltd.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.849[a]	.721	-.254	2.14568

a. Predictors: (Constant), EV, RoE, ICP, OP, CR, RoCE, NPM, RoA

Values mentioned in the above table represents that in case of Mahindra & Mahindra Ltd. independent variables account for 84.9% of the change in the dependent variable.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.841	7	3.406	.740	.681[a]
	Residual	9.208	2	4.604		
	Total	33.049	9			

a. Predictors: (Constant), EV, RoE, ICP, OP, CR, RoCE, NPM, RoA

b. Dependent Variable: INVENTORY TURNOVER RATIO

The results of regression analysis for Mahindra & Mahindra Ltd. represents that the relationship between dependent variables and independent variables is insignificant ($p>.05$, $F = 0.740$).

Results of Regression Analysis for Hero MotoCorp Ltd.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1.000[a]	.999	.992	.82816

a. Predictors: (Constant), EV, RoE, ICP, OP, CR, RoCE, NPM, RoA

Values mentioned in the above table represents that in case of Hero MotoCorp Ltd. independent variables account for 100.0% of the shift in the relying upon dependent parameter.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	712.888	7	101.841	148.490	.043[a]
	Residual	.686	1	.686		
	Total	713.574	8			

a. Predictors: (Constant), EV, RoE, ICP, OP, CR, RoCE, NPM, RoA

b. Dependent Variable: INVENTORY TURNOVER RATIO

The results of regression analysis for Hero Motocorp Ltd. represents that the relationship between dependent variables and independent variables is significant (p>.05, F = 148.490).

Results of Regression Analysis for Bajaj Auto Ltd

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.991[a]	.982	.909	1.84744

a. Predictors: (Constant), EV, RoE, ICP, OP, CR, RoCE, NPM, RoA

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Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.991[a]	.982	.909	1.84744

Values mentioned in the above table represents that in case of Bajaj Auto Ltd. independent variables account for 99.1% of the change in the dependent variable.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	367.248	8	45.906	13.450	.051[a]
	Residual	6.826	2	3.413		
	Total	374.074	10			
a. Predictors: (Constant), EV, RoE, ICP, OP, CR, RoCE, NPM, RoA						
b. Dependent Variable: INVENTORY TURNOVER RATIO						

The results of regression analysis for Bajaj Auto Ltd. mentioned in table …. represents that the relationship between dependent variables and independent variables is significant (p=.05, F = 13.450).

Regression results show that the relationship between financial variables and Inventory Turnover Ratio as an indicator of SCM is statistically significant in case of Maruti Suzuki Inida Ltd., Hero MotoCorp Ltd., and Bajaj Auto Ltd. whereas, no significant relationship was observed between these variables for Mahindra and Mahindra Ltd.

CONCLUSION

It is concluded that observation process analysed financial performance may perhaps affect the Supply chain management of automobile industry, information connected with different monetary execution pointers and store network the executives marker has been extricated from

all fundamental vehicle organizations. The financial analysis has recognized that the relationship between financial variables and Inventory Turnover Ratio as an indicator of Supply Chain Management is statistically significant in case of Maruti Suzuki India Ltd., Hero MotoCorp Ltd., and Bajaj Auto Ltd. The results of regression have been different. Maruti Suzuki India's independent variables explain 99.7 percent of the change in the dependent variable, while Mahindra & Mahindra Ltd.'s independent variables explain only 84.9 percent. Hero MotoCorp Ltd.'s change in the dependent variable is caused by factors outside of the company, while Bajaj Auto Ltd.'s change in the dependent variable is caused by factors outside of the company.

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