

Study of Inventory Management and Profitability for selected Automobile companies in India

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Abstract:

This study examined inventory management and profitability of selected Automobile companies in India. This analysed data spanned a ten year period of 2012-13 to 2021-22. Data was collected from secondary sources. Mean and C.V. derived for analysis of inventory composition. Statistical analyses of the data were done using descriptive statistics while the effect were tested using regression analysis at 0.05 level of significance. Study found that there are more uncertainties and risks associated with managing the work in progress inventory whereas raw material and finished goods are relatively stable. It is also found that Raw material turnover, Work in progress turnover, Finished goods turnover and Net profit margin have significant relationship with each other. This study recommend that Automobile companies should develop proper inventory management strategy.

Key-Words: Inventory Management, Raw Material Turnover, Work in Progress Turnover, Finished Goods Turnover, Net Profit Margin

Introduction:

Inventory is defined as goods and materials owned by a company at any particular time, including raw material, work in process, and finished products. The purpose of the inventory is to provide a buffer between demands and supply as well as continue production flow and ensuring that products are available as per customer requirements. This means that Inventory management is very important for companies. Effective inventory management can also lead to a higher return on investment for a company. By optimizing inventory levels, a company can reduce its costs and increase its sales revenue at same time, which can lead to a higher return on investment. Thus Inventory management helps company to ensure the right amount of inventory at all times without excess blockage of working capital as well as fulfil customer requirements. Automobile Industry is pivot of any country's economic development. In India Automobile industry contribute 7.1% in GDP. India aims its auto industry size to Rs. 15 lakh crores by end of year 2024. So in this current arena, Automobile Industry is rising star of Indian Economic. In Automobile Industry many parts are used for assembly and to produce finish product. Looking at the importance of Automobile Industry especially in India, it is indeed important that this industry manage their inventory effectively and boost their profitability.

Review of Literature:

- 1) (Anisere-Hameed, 2021) This study examined the effect of inventory management on profitability of manufacturing companies. The purpose of the study was to examine the effect of Inventory management on return on asset, return on investment, net operating margin, and net income of manufacturing firms in Nigeria. To achieve this purpose researchers used descriptive and inferential methods of data analysis. Pearson's correlation model and pooled panel regression analysis and time series applied for to examine the relationships between inventory management and profitability. Researchers concluded that there is a significant effect of inventory management on return on asset, return on investment and net profit. It also influenced the net income of the firm.
- 2) (Himmatrao, 2021) This study was about inventory management practices and their influence on financial performances of small-scale manufacturing enterprises located at semi-urban places like Ahmednagar district. The main objectives of this study were to study how firms follow inventory management policies, inventory management practices, factors affecting inventory management, challenges faced in managing inventory. To achieve these objectives, researchers collect primary as well as secondary data of various firms. They applied ANOVA, Z-Score, weighted average score and ranking statistical tools to evaluate research hypothesis. He found that there was a significant relationship between inventory in working capital and current ratio, debtors' receivable period, gross profit ratio, inventory holding, inventory turnover, overall profitability of firms.
- 3) (Muhindo Cranimar, 2021) In this paper researcher examined relationship between inventory management and financial performance of Hospitals. For this study researcher used a closed-ended questionnaire to collect data and simple linear regression for data analysis. They found that hospitals should adopt robust and scientific inventory management systems and models that aim to optimize stock levels and minimize costs if they are to achieve substantial financial performance. It also suggested that hospitals should adopt scientific inventory management techniques and decision models to avoid stock-outs, minimize costs and improve service delivery.
- 4) (Shukla, 2021) In this paper Researcher used various ratios for evaluating profitability. Researchers used rank tests to measure company profitability. The rank Test was performed by considering all the ratios to compare the company performance. It was applied on financial performance based on mean and Financial Performance to check Consistency of company. He found that inventory turnover ratio and gross profit ratio have positive correlation.

- 5) (Karki, 2020) Stated the effect of inventory management on profitability. Finish goods inventory was employed as the independent variable and net income was employed as dependent variable. The result of this research indicates that there is a significant relation between inventory management and profitability, The study proved that efficient and effective inventory management would lead to higher profitability.

- 6) (HH Dedunu, 2018) This study investigates the relationship between company performance and inventory management. Researchers used inventory days as a dependent variable and gross profit and net profit as an independent variable. According to researchers most companies implement different tools such as JIT, some applied ERP, SAP systems to control their inventory efficiently. In this study he employed descriptive analysis, correlation analysis and regression analysis using STATA package to investigate the effect of inventory management. According to the analysis result, researcher identified inventory management and gross profit had a positive relationship, net profit had a negative relationship with inventory management significantly affecting to gross profit margin and net profit margin.

Resesarch Methodology:

Objectives of the study:

- a. To examine composition of Inventory of the selected automobile companies in india
- b. To evaluate influence of Raw Material Inventory, Work In Progress Inventory, Finished Goods Inventory on the Profitablity.

Signifance of the Study:

Inventory management is very important for Automobile industry due to the fact that they have higher cost of inventory due to their nature of business. Automobile components and finished products are expensive and take up a lot of space, making inventory management a critical factor in ensuring profitability. By effectively managing their inventory, automobile companies can reduce costs, improve cash flow and reduce the risk of stockouts, all which can contribute to increased profitability.

Hypothesies of the Study:

H01: There is no statistically significant difference between composition of Inventory of selected Automobile companies in India.

H02: There is no significant impact of Raw material, Work-in-progress, Finished goods on Profitability of selected Automobile companies in India.

Period of the Study: The period of the study selected is ten years from 2012-13 to 2021-22.

Sources of Data

The study is analytical in nature. For this study secondary data is used. The required data were collected from domain of Centre for Monitoring Indian Economy (CMIE) for the period 2012-13 to 2021-22. Prowess database of CMIE is the most reliable and empowered corporate database. Data classified and selected as per requirement of the study.

Sample Selection:

This research paper is focused on Automobile Industry. Since an automobile industry is segmented mainly in four segments i.e. Two-wheeler, Three-wheeler, Commercial Vehicle and Passenger vehicle. For the purpose of this study commercial vehicle segment companies are selected according to highest market share.

Selected companies are as under:

1. Maruti Suzuki
2. Hyundai
3. Tata Motors
4. Mahindra and Mahindra
5. Toyota Kirloskar

Research Techniques

In this study variables taken into account are Raw Material Inventory, Work In Progress Inventory, Finished Goods Inventory. They are taken as independent variables. The Net Profit Margin is taken for profitability measure and the dependent variable. The voluminous and historical data was collected for ten years and analyzed with appropriate numerical techniques.

Financial and Statistical Tools:

For assessing composition of inventory Mean, Standard deviation and Coefficient of variation is used. To check the impact of Raw material, Work in progress and Finished goods on profitability multiple regression model is applied.

Data Analysis and Interpretation:

Table 1 contains Mean and C.V. of Raw Material, Work in Progress and Finished Goods. It indicates that there is a higher degree of variability in the work in progress inventory compared to the raw material and finished goods inventory. This could imply that there are more uncertainties and risks associated with managing the work in progress inventory for the selected Automobile Companies in India. The lower CV values for raw material and finished goods inventory suggest that these inventory components may be more stable and predictable, which could facilitate better planning and management. This could potentially lead to better cost control, improved operational efficiency and increased profitability.

Table:1

	Raw Material	Work In Progress	Finished Goods
Mean	1206.60	238.37	1254.98
C.V	44.39	95.16	66.10

Table 2 indicates that the R square value is 0.545, which indicates that 55% of the variation in the dependent variable is explained by the independent variables while 45% of the variation is explained by other factors outside the model and the error term. The R-value is 0.738, which indicates a strong positive correlation between the dependent and the independent variables.

Table:2

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.738 ^a	.545	.515	3.226	1.860

a. Predictors: (Constant), Finished Goods Turnover, Work In Progress Turnover, Raw Material Turnover

b. Dependent Variable: Net Profit Margin

From the ANOVA table (Table 3), the regression source of variation of 573.326 is higher than residual source of variation of 478.813. Thus, the regression model is able to explain larger portion of the variations in the dependent variable (NPM) than the residual source of variation. The p-value is .000 which is less than the 0.05 and 0.01, set as standard significance levels indicating that the model is significant and fit.

Table:3

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	573.326	3	191.109	18.360	.000 ^b
	Residual	478.813	46	10.409		
	Total	1052.139	49			

a. Dependent Variable: Net Profit Margin

b. Predictors: (Constant), Finished Goods Turnover, Work In Progress Turnover, Raw Material Turnover

The resultant regression equation from Table 4 is as follow

$$Y = -10.954 + .559RMT + .012WPT + .012FGT$$

The coefficient 0.559 is associated with RMT. This means that for every one unit increase in RMT, the predicted value of Y will increase by 0.559 units. the second independent variable, which stands for a variable that is WPT. The coefficient associated with this variable is 0.012. This means that for every one unit increase in WPT, the predicted value of Y will increase by 0.012 units. the third independent variable, which stands for a variable that is FGT. The coefficient associated with this variable is also 0.012. This means that for every one unit increase in FGT, the predicted value of Y will increase by 0.012 units, all else being equal. -10.954: This is the intercept term or constant term, which represents the predicted value of Y when all independent variables are equal to zero. The highest VIF value is 1.082, which is well below the threshold of 10, indicating that the variance inflation factor is low and the independent variables are not highly correlated with each other. there is no significant multicollinearity in this model.

Table:4

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-10.954	2.012		-5.445	.000		
Raw Material Turnover	.559	.098	.587	5.676	.000	.924	1.082
Work In Progress Turnover	.012	.004	.297	2.887	.006	.937	1.068
Finished Goods Turnover	.012	.014	.085	.847	.401	.976	1.024

a. Dependent Variable: Net Profit Margin

Limitation of the Study:

The data used in this study have been taken only from secondary sources and as such its findings depend entirely on the accuracy of such data.

Conclusion

The coefficient of variation (CV) of the three inventory components (raw material, work-in-progress, and finished goods) varies significantly, indicating that there are differences in the composition of inventory among the selected automobile companies in India. The coefficient of variation measures the relative variability of each inventory component in relation to its mean. The higher the CV, the higher the variability of the data points, and the more diverse the composition of inventory:

Therefore, the null hypothesis that there is no statistically significant difference between the composition of inventory of selected automobile companies in India can be rejected. In other words, there are statistically significant differences in the inventory composition among the selected automobile companies in India

From above analysis concluded that there is a significant relationship between raw material turnover, work-in-progress turnover, and finished goods turnover and net profit margin of selected automobile companies in India

Recommendation:

It is recommended that selected automobile companies closely monitor their inventory turnover rates, particularly for raw materials, work-in-progress, and finished goods, in order to optimize their inventory management practices and improve profitability.

There are significant differences in the composition of inventory among the selected companies, it may be beneficial for them to conduct further analysis to identify the root causes of these differences and develop strategies to address any inventory imbalances.

Overall, effective inventory management is critical for the success of any business, and these findings highlight the importance of monitoring and optimizing inventory turnover rates to enhance profitability and gain a competitive advantage in the automobile industry in India

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