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Impact of The Cash Conversion Cycle on Financial Performance: A Study of the Tyre Manufacturing Sector

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Abstract

Purpose: The purpose of the study is to examine the impact of certain factors, including CCC, ATO, AT, NPM, LEV, FS, and TQ, on the financial performance (ROA) of the firms belonging to the sector: Indian Tyres and Allied. ***Methodology:*** The least squares regression method is used to study the impact of seven independent variables on ROA. A set of five tire firms was selected, and a 10-year time interval was taken from 2013–14 to 2022–23 for data evaluation. ***Findings:*** The results indicate that cash conversion cycle (CCC), asset turnover (ATO), and net profit margin (NPM) are statistically significant predictors of return on assets (ROA), having 84.15% of the impact on the financial performance (ROA) of the selected firms. ***Practical Implications:*** The study highlights the notable influence of CCC, ATO, and NPM on ROA, thus enabling us to focus on the pivotal variables that impact financial performance. ***Originality/Value:*** This research will be extremely useful to target and focus on the factors that influence the financial performance of the firm in the particular industry context.

Keywords: #Financial Performance, #Return on Assets, #Cash Conversion Cycle, #Asset Turnover Ratio, #Asset Tangibility, #Net Profit Ratio, #Financial Leverage, #Firm size, #Tobin's Q, #Indian Tyre, #allied sector.

Introduction

In the context of industrial economics, the efficient management of financial resources is the keystone that holds organizational success and longevity. At the center of this lies the prudent management of the cash conversion cycle (CCC), which is about the time it takes a company to convert its raw materials into cash flow from sales. The CCC is one of the major components of working capital management (WCM), which includes inventory management, accounts receivable collection, and accounts payable settlement. Getting familiar with the CCC's intricacies is crucial because it's not only about the company's operational efficiency but also has profound implications for the company's financial performance and sustainability in the future.

In India, the tire manufacturing sector proves to be a significant contributor to industrial growth, combining innovations with global competitiveness. India's tire industry comprises a range of manufacturers, both domestic players and multinational companies, engaged in the production of various tire categories, including passenger cars, commercial vehicles, and specialty tires. However, overcoming the multifaceted nature of challenges, like fluctuating raw material prices, ever-changing consumer preferences, and regulatory compliance, is one of the key aspects of the tire and allied manufacturing sector in India today. In this regard, delving into the interaction of the CCC and financial performance becomes pivotal to understanding the operational dynamics and strategic development of companies in this industry.

This research intends to analyze the influence of the CCC on the financial performance of tire manufacturing companies operating in India. Additionally, the study aims to examine the primary factors in the tire industry that influence ROA dynamics, including the cash conversion cycle, asset turnover ratio, asset tangibility, net profit margin, financial leverage, size of the firm, and Tobin's Q.

Research Gap

The existing research in the Indian tyre manufacturing sector lacks the analysis of combined influence of the Cash Conversion Cycle (CCC), Asset Turnover Ratio, Asset Tangibility, Net Profit Ratio, Financial Leverage, Firm size and Tobin's Q on financial performance (ROA). Identifying these interrelationships can provide valuable insights for strategic decision-making and key performance involved within the industry.

Review of Literature

Anser and Malik (2013) examined the effects of working capital management on the profitability of textile firms in Pakistan. The paper dwells on the issues related to the efficiency of working capital management in textile companies; furthermore, it gives important information for industry practitioners.

Deloof (2003) analyzed the association between working capital management and profitability in the case of Belgian companies. This study contributes to a better understanding of how working capital management can influence the profitability of Belgian business companies.

Gill et al. (2010) studied the association between working capital and profitability in the United States. The research findings show how differences in working capital management practices may affect the financial performance of US companies and provide actual recommendations for financial management strategies.

Nobanee and Abdullatif (2011) investigated the link between working capital management and the firm's profitability through different economic cycles in Kuwait. Their study gives an insight into the methods of working capital and their effect on firm profitability in different situations.

Panigrahi (2013) focused on the correlations between working capital management and profitability in the Indian cement industry. The research contributes to the literature by concentrating on one particular area, thereby providing a window into the specific working capital dynamics and profitability influences that are peculiar to the Indian context.

Lancaster and Stevens (1999) analyzed the forecasting capability of inventory and cash conversion cycles in terms of profitability. They shed light on factors that influence the financial ability of firms, specifically the role of supply chain management and working capital effectiveness.

In the European insurance industry, Ebben and Johnson (2011) examined efficiency in entrepreneurship. Through the analysis of efficiency and financial picture factors, their work will be an addition to exploring the underlying factors of profitability in the insurance industry.

Peel et al. (2000) discussed the probable causes of corporate failure in the UK corporate industry. This study allows us to identify the determining points that create enterprise sustainability, which is determined by financial robustness, leading to suggestions for risk management and strategic planning.

Moss and Steins (1993) looked into the reason behind the influence of a firm's size on accounts receivable management. This research adds to the deepening of knowledge on organizational attributes like size that can shape working capital management strategies and overall financial performance.

Shilling (1996) gave an empirical opinion about the importance of liquidity for the profit of German companies. By exploring the linkages between means of liquidity management and financial performance, the given study presents notions of the forces that are responsible for the quality of the earnings of the German corporate environment.

Li and Wang (2021) performed a meta-analysis to explore the impact of the Cash Conversion Cycle (CCC) on Financial Performance. The study presented a detailed review of relevant research findings, unveiling the ties between CCC and financial performance across industries.

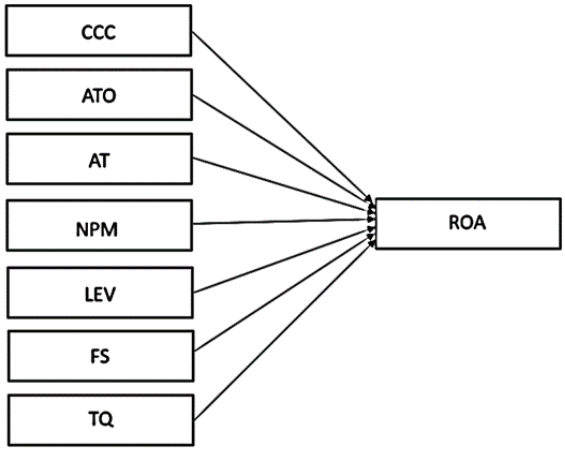
Chen and Wu (2020) studied the correlation between Asset Turnover Ratio (ATO) and Return on Assets (ROA) in Global Manufacturing Sectors. The study offered insights into how ATO influences financial performance in diverse manufacturing industries globally providing insights concerning operational efficiency and profitability.

Rodriguez and Perez (2019) carried out a Cross-Country Analysis on Asset Tangibility and Firm Profitability. Their work, which is available in the Journal of Business Economics, examined how tangible assets in a company affect its profitability from one country to another. The results reveal a critical impact of tangible assets in enhancing financial performance globally.

Conceptual Framework

The study is built on a framework with dependent variables including CCC, ATO, AT, NPM, LEV,

FS, and TQ that are dependent on ROA, the dependent variable.



Objectives

(1) To examine the influence of CCC on the financial performance of Tyre manufacturing firms in India.
(2) To examine the influence of ATO, AT, NPM, LEV, FS, and TQ on the financial performance of Tyre manufacturing firms in India.

Data and Methods

To find out how the CCC, ATO, AT, NPM, LEV, FS, and TQ affect a company's profitability in India's Tyre and allied sector, secondary cross-sectional data is gathered from the publicly available audited annual reports on the website Money Control. Purposive sampling was used to collect the panel data from the Indian manufacturing firms listed on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE). The sample for this research covers ten years of data from 2012-13 to 2022-23 from selected firms. This study therefore encompasses a total of 50 panel (balanced) observations of five distinct firms in the Tyres and Allied sectors: Apollo Tyres, MRF, JK Tyres, TVS Shrichakra, and CEAT Tyres.

Hypotheses:

Regression models have been used to evaluate the null hypotheses given below.

H1. The CCC has no significant effect on the firm's financial performance.

H2. The ATO has no significant effect on the firm's financial performance.

H3. The AT has no significant effect on the firm's financial performance.

H4. The NPM has no significant effect on the firm's financial performance.

H5. The LEV has no significant effect on the firm's financial performance.

H6. The FS has no significant effect on the firm's financial performance.

H7. The TQ has no significant effect on the firm's financial performance.

Model specification:

To explore the impact of the CCC, ATO, AT, NPM, LEV, FS, and TQ on financial performance, we have applied the least squares (LS and AR) regression model to the dynamic panel data. Return on assets (ROA) is employed as a financial performance indicator and dependent variable in the regression models. The firm's ATO and LEV have been used as the independent variables, while the CCC, AT,

NPM, FS, and TQ have been used as the control variables, as these variables significantly affect the financial performance of the firm.

The variables are calculated as follows:

Category	Variable Name	Symbol	Formula
Dependent Variable	Return on Asset	ROA	Earnings before Interest and Taxes / Total Assets
Independent Variable	Cash Conversion Cycle	CCC	(Inventory / Cost of Goods Sold) * 365 + (Receivables / Sales) * 365 – (Account Payables / Cost of Goods Sold) * 365
	Asset Turnover Ratio	ATO	Net Sales / Average Total Assets
	Asset Tangibility	AT	Fixed Assets / Total Assets
	Net Profit Margin	NPM	(Net Profit / Total Revenue) *100
	Leverage	LEV	Earnings before Interest and Taxes / Earnings before Taxes
	Firm Size	FS	Total Assets
	Tobins Q	TQ	(Market Cap + Total Liabilities) / Total Assets

Regression Equation:

$$ROA_{it} = \beta_o + \beta_1 CCC_{it} + \beta_2 ATO_{it} + \beta_3 AT_{it} + \beta_4 NPM_{it} + \beta_5 LEV_{it} + \beta_6 FS_{it} + \beta_7 TQ_{it} - \varepsilon_{it}$$

Where β_o is the constant term/intercept,

β is the coefficient,

i is the number of firms,

t is the time period,

ε is the error term.

Diagnostic tests:

Basic pre- and post-estimation diagnostic tests are carried out to ensure the regression findings are accurate and impartial.

Panel unit root: The panel unit root was confirmed using the "Fisher-type unit root based on the augmented Dickey-Fuller" test, which was conducted with the null hypothesis that all panels had unit roots. We discovered p-values of 0.000, which indicates that the variables are significant at the 5% level and that the variables ROA and AT do not have a unit root at that level. The other variables, including CCC, ATO, NPM, LEV, FS, and TQ, do not have a unit root at first difference.

Multicollinearity: All variables have correlation coefficients less than 0.80, meaning there is no multicollinearity among the independent variables (Cooper and Pamela, 2014; Gandhi, 2003; Wooldridge, 2015). The "value of variance inflation factor (VIF)," which is less than 5.00 for all independent variables, further demonstrates the lack of multicollinearity (Lind et al., 2012; Gujarati, 2003; Mwangi, 2016).

Autocorrelation: The presence of autocorrelation in panel data was examined using the Wooldridge test. In the Wooldridge test, "there is no first-order autocorrelation" is the null hypothesis. The autocorrelation is a concern since the Wooldridge

test gives p-values of less than 0.05 (0.0000 and 0.0001, respectively) for the regression model.

Results

Table No. 1 provides descriptive data for each of the study's variabl

Table No.1: Descriptive Statistics

	ROA	CCC	ATO	AT	NPM	LEV	FS	TQ
Mean	6.0866	57.0712	88.5822	0.4966	5.3536	1.4759	8994.253	0.9336
Median	5.235	54.74	90.715	0.47373	4.76	1.2497	7330.795	0.9881
Maximum	20.58	144.13	236.87	0.72362	13.76	4.8897	24023.75	1.3023
Minimum	0.6	-10.5	0.62	0.29785	0.58	0.8945	800.42	0.5184
Std. Dev.	4.1739	31.52	62.3984	0.0927	2.9753	0.8265	6551.016	0.186
Skewness	1.4894	0.1734	0.0008	0.598	0.8108	3.0635	0.7422	-0.5999
Kurtosis	5.5957	3.0581	2.4386	3.086	3.3841	12.3715	2.4901	2.5747

Source: Authors own calculations using EViews 10

The minimum, the maximum, and the standard deviation of the variables are shown in terms of within, between, and overall value in the table, respectively, while the mean is used to calculate the overall value of the variables. The average CCC of our sample firms is 57.07 days with a standard deviation of 31.52 days, while the average value of ROA is approximately 6.09% with a standard deviation of 4.17%, indicating moderate variability, and the mean of AT is 0.50 with a standard deviation of 0.09. Our sample firm's average ATO is 88.58 times, with a standard deviation of 62.40, and their average LEV is 1.48 times, with a standard deviation of 0.83. The average NPM of our sample firms is 5.35% with a standard deviation of 2.98%, while the average value of FS is approximately 8994.25 with a large standard deviation of 6551.02, and the mean of TQ is 0.93 with a standard deviation of 0.19.

Table No.2: Regression Equation Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CCC	-0.030031	0.013399	-2.241233	0.0304
ATO	0.019143	0.006725	2.846601	0.0068
AT	-7.86293	4.406866	-1.784245	0.0816
NPM	0.966728	0.123489	7.82847	0.0000
LEV	-0.082107	0.408043	-0.20122	0.8415
FS	-0.000111	6.82E-05	-1.630761	0.1104
TQ	-0.33308	2.324465	-0.143293	0.8867
R-squared	0.841488			
F-statistic	31.85206			
Durbin-Watson stat	1.762179			
Prob (F-statistic)	0.000000			

Source: Authors own calculations using EViews 10

Interpretation of Coefficients:

Based on the regression results of Table No.2 generated by Eviews:

CCC (Cash Conversion Cycle): The coefficient is -0.030031 with a t-statistic of -2.241233 and a p-value of 0.0304, suggesting that CCC is statistically significant in explaining the variation in ROA.

ATO (Asset Turnover Ratio): The coefficient is 0.019143 with a t-statistic of 2.846601 and a p-value of 0.0068, indicating that ATO is statistically significant in explaining the variation in ROA.

AT (Asset Tangibility): The coefficient is -7.862930 with a t-statistic of -1.784245 and a p-value of 0.0816, suggesting that AT is not statistically significant in explaining the variation in ROA.

NPM (Net Profit Margin): The coefficient is 0.966728 with a t-statistic of 7.828470 and a p-value of 0.0000, suggesting that NPM is statistically significant in explaining the variation in ROA.

LEV (Leverage): The coefficient is -0.082107 with a t-statistic of -0.201220 and a p-value of 0.8415, indicating that LEV is not statistically significant in explaining the variation in ROA.

FS (Firm size): The coefficient is -0.000111 with a t-statistic of -1.630761 and a p-value of 0.1104, indicating that FS is not statistically significant in explaining the variation in ROA.

TQ (Tobins'Q): The coefficient is -0.333080 with a t-statistic of -0.143293 and a p-value of 0.8867, indicating that TQ is not statistically significant in explaining the variation in ROA.

Model Fit:

R-squared: The R-squared value is 0.841488, indicating that approximately 84.15% of the variation in ROA is explained by the independent variables in the model.

F-statistic: The F-statistic is 31.85206 with a p-value of 0.0000, suggesting that the overall model is statistically significant.

Durbin-Watson Statistic: The Durbin-Watson statistic is 1.762179, which indicates positive autocorrelation.

Conclusion:

The regression model indicates that Cash Conversion Cycle (CCC), Asset Turnover (ATO), and Net Profit Margin (NPM) are statistically significant predictors of Return on Assets (ROA), while Asset Tangibility (AT), Leverage (LEV), Firm Size (FS), and Tobin's Q (TQ) are not statistically significant predictors.

Managerial Implications

The research uncovers significant implications for the Indian Tyre and Allied sector, emphasizing Cash Conversion Cycle (CCC), Asset Turnover (ATO), and Net Profit Margin (NPM) as the prime drivers for companies' financial performance, explaining 84.15% of the impact on the financial performance (ROA) of the firms. In addition, the impact of variables with less influence on ROA is identified, thus allowing managers to prioritize corrective actions effectively.

Limitations and Scope for Further Study

The study is limited to only six independent variables that are used to examine their impact on financial performance (ROA) within one sector, i.e., the Tyre manufacturing sector of India. Further studies can be conducted by taking different variables into account across distinct sectors to enhance the quality and reliability of the results.

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