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Comparative financial and strategic analysis of leading Indian auto component firms: Ratio and econometric methods

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Abstract

This study conducts a comprehensive comparative financial analysis of two leading firms of Indian Auto Component Industry, TACO IPD and Varroc Polymers, employing a mixed method approach which combined financial ratio and econometric modelling. This research examines crucial aspects such as profitability, liquidity, leverage, cashflows, efficiency, etc over three-year period. This assessment gives in-depth information about the company's strategic positioning and the financial health of both the companies. In this study we have tested 5 hypotheses which covers various dimensions such as Current Ratio, Operating Cash Flow Ratio, EBITDA Margin, ROCE, and Inventory Days with Gross Profit Margin. Based on the findings, there is significant difference between the financial performance of both the companies. The emphasis was on particularly on the capital structure, working capital management, and the profitability margins. Econometric Analysis resulted the critical relationship between profitability, and financial performance.

Keywords: Ratio analysis, profitability, working capital management, financial performance, auto component industry, econometric modelling, Levene's test, Wilcoxon-signed rank test

Introduction

Indian Auto Motive Industry is one of the most rapidly growing sectors globally, which has significantly contributed to India's Manufacturing GDP and Employment generation. In this sector, the Auto Component Industry plays crucial role supporting both domestic automotive manufacturers and global supply chains. This sector has emerged unprecedented growth which is driven by the technological advancements, increased demand in vehicles, export opportunities and government policies which is supporting the manufacturing industry. It is most crucial aspect for any company to evaluate their financial performance for understanding their strategic position, future growth potential, etc. It is most important to make efficient use of working capital, optimize their operational activities and maintain the company's financial health in long term. For the management, policy makers and investors, etc financial analysis plays pivotal role in current scenario due to supply chain disruptions, volatility of raw material prices, technological advancements, new regulatory frameworks, etc. This research focuses on two prominent players in Indian Auto Component Industry, TACO IPD and Varroc Engineering Limited. Both companies adopt different strategic approaches and market positioning within the sector. TACO IPD is more focussed on the Interiors and Plastics, and Varroc Engineering Limited is focussed on the electronics, Polymers, Lightning, etc. But for this research we have taken the data of Varroc Polymers. The comparative analysis goes beyond the financial ratio analysis by focussing on the Econometric modelling which identifies the causal relationships and Predictive patterns in the financial performance. This approach addresses the critical questions regarding the Working capital management, Profitability, Efficiency, and the relations between the critical indicators of the financial performances of both the companies. Furthermore, the econometric analysis provides the broader understanding of the financial performance indicators which has to be considered accurately while considering the crucial parameters.

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Literature Review

Post-Crisis Bank Profitability in BRICS: A CAMEL Approach

This study took a close look at how banks in the BRICS nations fared after crises from 2009 to 2020, revealing that their profitability is influenced by their past performance. It turns out that key factors within the CAMEL framework play a significant role: capital adequacy shows a mixed effect on profitability it's beneficial for equity but can be detrimental for assets. Interestingly, non-performing loans can actually boost returns based on assets, suggesting a willingness to take risks, while liquidity tends to hurt asset profitability. The quality of management is vital for returns on assets, though it matters less for equity, which points to the need for operational efficiency. Internal elements like capital management and risk-taking are crucial, but external factors like the size of the bank and economic growth have a more nuanced impact. Overall, these findings highlight how essential effective risk management and smart capital allocation are for maintaining profitability in these ever-changing economies. (Aderogba *et al.*, 2025) ^[1].

A Study of Financial Performance of Automobile Industry with Special Reference to Mahindra & Mahindra Ltd. And Maruti Suzuki India Ltd

This research examines the financial outcomes of two significant entities within the Indian car industry: Mahindra & Mahindra Ltd. and Maruti Suzuki India Ltd. Utilizing financial ratio analysis, it assesses their growth trajectories and stability. The findings indicate that both firms have advanced in enhancing their profitability and optimizing asset utilization. For example, Mahindra & Mahindra showcases a robust current ratio, indicative of considerable liquidity, whereas Maruti Suzuki is experiencing growth yet still encounters certain liquidity issues. Both organizations have improved their profit margins, with Mahindra & Mahindra consistently expanding and Maruti Suzuki recently achieving notable increases in net profit. Moreover, both companies have excelled in debt management; Mahindra & Mahindra has reduced its dependency on debt, while Maruti Suzuki boasts a debt-free operation, relying entirely on its own capital. In conclusion, these results provide insights into the financial robustness and competitive strengths of these firms in India's evolving automotive sector, offering essential information for investors and decision-makers. (Maheswari *et al.*, 2023) ^[4].

Financial Performance of Nifty 50 Automobile Companies in India - Empirical Comparative Analysis

This research examined the financial outcomes of selected automobile firms listed in the Nifty 50 index in India, covering the period from 2009-10 to 2018-19. It utilized secondary information sourced from annual reports and various financial online platforms. The analysis incorporated Edward Altman's Z-score, Internal Growth Rate (IGR), and Sustainable Growth Rate (SGR) as dependent factors, while profitability, liquidity, and per share metrics acted as independent factors. The findings indicated that Earnings Per Share (EPS), Dividend Per Share (DPS), and Net Profit Margin (NPM) positively influenced IGR (with an R-squared value of 84.9%) and SGR (82.1%). Furthermore, EPS, Return on Capital Employed (ROCE), Book Value Per Share (BVPS), NPM, Asset Turnover, and Current Ratio significantly impacted Altman's Z-score at the

0.01 significance level, while Quick Ratio and Price/Book Value per share were significant at the 0.05 level. The study rejected the null hypothesis of no significant association, demonstrating that IGR, SGR, and Altman's Z-score are positively correlated at the 0.01 significance level. This implies that the independent factors notably affect the dependent ones, accounting for 89.8% of the Altman Z-score for the examined companies. (Govindarajan *et al.*, n.d.)

Does Working Capital Management Affect Profitability of Belgian Firms?

This study takes a closer look at how working capital management (WCM) impacts corporate profitability, focusing on a sample of 1,009 large non-financial firms in Belgium from 1992 to 1996. The research employs various metrics, including the number of days for accounts receivable, inventories, accounts payable, and the cash conversion cycle, to evaluate WCM. The results show a notable negative relationship between gross operating income and the duration of accounts receivable and inventories, indicating that shortening these periods could boost profitability. Although the cash conversion cycle initially showed a negative coefficient that wasn't significant in fixed effects models, it became highly significant in OLS regressions, suggesting that a shorter cash conversion cycle can enhance profitability. Furthermore, the study uncovers a negative link between accounts payable and profitability, implying that less profitable firms are likely to postpone their bill payments. In summary, managers could improve corporate profitability by reducing the number of days for accounts receivable and inventories, as well as by effectively managing accounts payable. (Deloof, n.d.)

Financial Performance Analysis of Indian Companies Belongs to Automobile Industry with Special Reference to India

This study probed oil and gas companies in Pakistan between the Years 2004 and 2009, Studying the Nexus among liquidity ratio and profitability. Results showed that solely the liquidity ratio has a significant effect on ROA. Remarkably ROE was not seen to be significantly affected by the current quick or liquidity ratio. On the other hand, ROI was affected by all three ratios: Current, Quick and Liquid although the current ratio negatively affected it. Overall, the research indicates that the liquidity ratio has effects on profitability, but their specific effects are different depending on the profitability major employed. (Sharma, 2025) ^[5].

Research Methodology

Sources of Data Collection:

This research uses quantitative research approach which is a comparative analysis of 2 companies TACO IPD and Varroc Polymers' financial performance. Research design consists descriptive and analytical methodology which has been combined by using traditional ratio-based approach along with the advanced statistical and econometric techniques to provide the companies financial performance and its strategic positioning. The methodology has 3 components: 1) Financial Ratio, 2) Statistical Hypotheses Testing, and 3) Econometric modelling for identifying the relationship and predictions. By using this multi-faceted approach, we get robust analysis and reliable conclusions

regarding the financial performance of both the companies. The data which is considered for this research is secondary data sourced from the audited financial statements, Annual Reports and regulatory filings of both the companies over 3-year period.

This research consists multiple statistical techniques to test the formulated hypotheses:

We have used the independent t-test for comparing the means between the two companies across various financial metrics, assuming equal variances and normal distribution. This test has been applied to the hypotheses 1,2,4, and 5 comparing the Net Profit Margin, Current Ratio, Debt-to-Equity Ratio and Operating Cash Flow Ratio respectively. We have used the Pearson Correlation Analysis to measure the strength and direction of linear relationship between the variables. This has been done particularly for the 3,6,7,8,9,10 and 11 hypotheses which examined the correlation between various financial variables. We have used the Regression Analysis for predictive modelling and establishing the causal relationship between variables. We have also used Paired Sample t-test and Non-parametric Tests (Wilcoxon Signed-Rank Test) for hypotheses 12 for comparing the related samples within the companies. This is particularly used when the data does not meet parametric test assumptions.

Research Problems

The Auto Component Industry in India faces multiple challenges including intense competition, margin pressures, technological disruption, supply chain complexities, and evolving customer demands. In this context, understanding which financial management strategies and operational approaches lead to superior performance becomes crucial for industry stakeholders. Despite being in the same industry, auto component companies exhibit some differences in capital structure, profitability and valuation. This research mainly focuses on determining, “To what extent do the financial performance indicators and valuation metrics differs between TACO IPD and Varroc Polymers, and how are these differences statistically significant?”. The crucial problems in this Auto Component Industry are: Differentiation of Financial Performance. Industry is lacking with comparative analysis studies of financial performance of leading auto component manufacturers using the statistical techniques. This gap limits the ability of the investor, management, analyst to make informed decisions. Another is optimization of Capital Efficiency. Auto component companies operate in a capital-intensive environment with a heavy investment in technology, infrastructure, working capital, etc. Understanding the

relationship between capital employed and financial returns remains inadequately explored in Indian context. Another problem is measurement of Operational Efficiency. Understanding the relationship between Operational Efficiency and financial returns needs empirical validation for decision making. Another problem faced is while managing the Cashflows and Liquidity. Due to cyclical trends, companies face working capital challenges. It is very crucial to understand the different approaches which can be obtained by the companies for managing their Liquidity and Cash flows efficiently. Another, challenge faced are related to the optimization of the Leverage and the Capital Structure. Focusing on this analysis we can make informed decisions as it involves complex decision making which includes multiple factors into consideration.

Research Objectives

- To conduct the comparative analysis of financial performance of TACO IPD and Varroc Polymers using multiple financial ratios and providing the evidence of performance differences and similarities across various financial dimensions.
- Use statistical techniques to test the hypotheses to validate the observed differences in the financial performances. This ensures that the results are based on statistical significance and not on the observational analysis.
- To compare and examine the profitability between 2 companies through NPM analysis, EBITDA margin evaluation and Return Metrics (ROCE), and identifying the sources of profitability differences and similarities.
- To assess the liquidity position of the companies based on Current Ratio Analysis and by comparing the Operating Cash Flow Ratio.
- To analyse the capital structure of both the companies and then analysing its impact on the financial performance. This is done through analysing the D/E Ratio and WACC.
- To compare and examine the operational efficiency by analysing the Inventory Days. Also to adopt the best strategy to improve the Working Capital. And enhancing the utilization of assets.
- To validate the econometric model that explains the relationship between the EBITDA Margin, ROCE.
- To know the capital structure and its relationship between the WACC and FCFF.
- To analyse the Pearson's Correlation between Inventory Days and Profitability measure of the companies.

Group Statistics											
	Company	N	Mean	Std. Deviation	Std. Error Mean						
Current Ratio	Varroc	3	1.217579874	.1347162439	.0777784597						
	IPD	3	.5765110243	.0228884289	.0132146406						
Independent Samples Test											
Levene's Test for Equality of Variances						t-test for Equality of Means					
			F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
										Lower	Upper
Current Ratio	Equal variances assumed		3.892	.120	8.126	4	.001	.6410688500	.0788930638	.4220265892	.8601111108
	Equal variances not assumed				8.126	2.115	.013	.6410688500	.0788930638	.3187574951	.9633802049

Fig 1: Group Statistics and Independent Samples Test (Output from SPSS)

Results and Discussions

1. Null Hypothesis: There is no significant difference in the average Current Ratio between Varroc and IPD.

Alternative Hypothesis: Varroc has a significantly higher average Current Ratio than IPD.

Independent Samples T-Test was used on SPSS to evaluate the financial performance of IPD and Varroc across 3-year period. This test was done to compare the Current Ratio between two companies. Prior testing this, we performed the Assumptions for Equal Variances, which was done through the Levene's Test. Along with that, descriptive statistics was conducted. All these tests were done on 95% confidence level.

Results

An independent samples t-test was conducted to compare the Current Ratio between two companies, Varroc Polymers and TACO IPD over a three-year period. The descriptive statistics indicate that the average Current Ratio of Varroc (1.2176) is significantly higher than that of IPD (0.5765). Also, there is higher Standard Deviation in Varroc of 0.1347 than that of IPD which is 0.0229. Before testing Mean Variances, we have performed Levene's Test for Equality of Variances to assess the assumption of homogeneity of variances. The result of test was non-significant ($p = 0.120$) which indicates that the assumption of Equal variances was not violated. The independent-samples t-test (equal variances assumed) showed a statistically significant

difference between the two companies. Since the hypothesis is Directional that is $\text{Varroc} > \text{IPD}$, a one-tailed test is appropriate for such case. Dividing the 2-tailed p-value by 2, that is $(0.001/2)$, results in a one-tailed p-value of 0.0005, which is highly significant at $\alpha = 0.05$. This result leads us to reject the null hypothesis. The Mean difference of 0.6411 and a 95% confidence interval which is ranging from 0.4220 to 0.8601 which excludes zero further confirms that Varroc's Current Ratio is significantly higher than IPD's.

The results support the hypothesis that Varroc has a significantly higher average Current Ratio compared to IPD over the observed period. A higher Current Ratio indicates stronger short-term financial stability, suggesting that Varroc is better positioned to meet its short-term obligations. Since the standard deviation for Varroc (0.1347) is notably larger than that of IPD (0.0229), it is indicating the there is more variability in liquidity management year-on-year. In contrast, IPD shows more consistency but at a significantly lower liquidity level, which might raise concerns about its ability to meet the short-term liabilities. Thus, it can be concluded with high confidence that Varroc's average Current Ratio is significantly higher than IPD's over the 3-year period.

2. Null Hypothesis: There is no significant difference in the Operating Cash Flow Ratio between Varroc and IPD.

Alternative Hypothesis: There is a significant difference in the Operating Cash Flow Ratio between Varroc and IPD.

Group Statistics											
	Company	N	Mean	Std. Deviation	Std. Error Mean						
Operating CF Ratio	Varroc	3	.3864611226	.2078252173	.1199879452						
	IPD	3	.2465834163	.2096152289	.1210214088						
Independent Samples Test											
			Levene's Test for Equality of Variances		t-test for Equality of Means						
			F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
										Lower	Upper
Operating CF Ratio	Equal variances assumed		.000	.986	.821	4	.458	.1398777063	.1704209153	-.333286610	.6130420225
	Equal variances not assumed				.821	4.000	.458	.1398777063	.1704209153	-.333300335	.6130557472

Fig 2: Group Statistics and Independent Samples Test (Output from SPSS)

The methodology used to know the difference in Operating Cash Flow between the IPD and IPD Varroc over 3-year period is Independent Samples T-Test on SPSS. The Operating Cash Flow Ratio of both companies were used to test this hypothesis. Before testing this, we have performed the Levene's Test for Equal Variances to know the assumptions of homogeneity of Variances.

For Varroc

Although Varroc has higher OCF Ratio, they show operational inefficiencies due to higher viability. They should focus on improving their Working Capital and minimizing the fluctuations in their cashflows. Another is that they must tighten their Receivables days by adopting strict credit policies. They must review the raw material sourcing strategies, logistics, overheads, etc, this will lead to increasing the Cash conversion from the Revenues. They must ensure that they are reinvesting their excess

operational cash in the technological upgradation, automation, etc to reduce the future cash outflows. Doing this will also give them a competitive advantage.

Results

The independent samples t-test was conducted to evaluate whether there is a statistically significant difference in the Operating Cash Flow Ratio between Varroc and IPD companies. The sample consisted of 3 observations for each company ($n=3$). An independent samples t-test was conducted to compare the Debt-to-Equity ratios between two companies: Varroc and IPD. Result shows that the Mean of Varroc Polymers is 0.3864 and that of TACO IPD is 0.2465. The standard deviation of Varroc Polymers is recorded to be 0.2078 and for TACO IPD it is 0.2096. Before testing the descriptive statistics, we have performed Levene's Test for Equality of Variances and based on those results, we got the F-value of 0.000 with a significance

value of 0.986. The F-value of 0.000 means that the variances between the groups means of the absolute deviations is extremely close to the zero, or it is effectively zero. In the above case it suggests that the average absolute deviation from the mean for Varroc is virtually identical to the average absolute deviation from the mean for IPD. Based on the Levene's Test, the assumption being tested is Homogeneity of Variances, also known as Homoscedasticity, the F value of 0.000 tells us that we have achieved the maximum possible homogeneity of variances. As we know that the small F-value leads to the large p-value, the p-value of 0.986 explains that there is 98.6% probability of observing a small difference in variances between the samples, if the true population variances are equal. As this is very high, we can confidently fail to reject the null hypotheses of Equal variances as p-value is greater than 0.05. We have got values of 0.821 at 4 degrees of freedom and a two-tailed significance value of 0.458. Since the p-value exceeds alpha level of 0.05, the result of the test is not statistically significant. The difference in means at 95% confidence interval ranged from -0.7966 to 1.2319, which includes zero, further reinforcing the non-significant result. The Mean Difference recorded was of 0.1398 which means the difference between the average Operating Cash Flow ratio of the Varroc and IPD. It basically means that if you calculated Mean Operating Cash Flow Ratio for Varroc - Mean Operating Cash Flow Ratio for IPD and got 0.1398, then Varroc's average Operating Cash Flow ratio was 0.1398 higher than IPD's. The t-statistic of 0.821 indicates that the observed difference between the two-group means is less than one standard error of the difference, suggesting a small effect relative to the variability in the data. Furthermore at 95% confidence interval for the mean difference ranged from -0.33329 to 0.61304. As this interval includes zero, it signifies that there is no statistically significant difference in the average Operating Cash Flow Ratio between Varroc and IPD during the observed period of 3 years. As per the above findings, looking from the financial performance standpoint measured by the Operating Cash Flows, both companies are statistically comparable within the observed period. Further studies should be conducted by considering the higher sample size and also by expanding the temporal range to improve the robustness of the studies.

3. Null Hypothesis: EBITDA Margin does not significantly predict ROCE for IPD and Varroc

Alternate Hypothesis: EBITDA Margin significantly predicts ROCE for IPD and Varroc

Descriptive Statistics			
Company		Mean	Std. Deviation
IPD	ROCE (%)	2.310754180	4.083150701
	EBITDA Margin (%)	.1517158548	.0065264695
Varroc	ROCE (%)	.2021266415	.0855029150
	EBITDA Margin (%)	.1105164390	.0268098285

Fig 3: Descriptive Statistics (Output from SPSS)

To test the impact of EBITDA Margin on ROCE, a simple Linear Regression Analysis was conducted. This was calculated separately for each company IPD and Varroc.

Along with Regression we also got the Pearson's Correlation and the descriptive statistics. This analysis contains the detailed interpretation of this hypothesis based on all the crucial tables of the Regression analysis. We have also calculated the collinearity statistics and Condition Index to know the presence of Multicollinearity.

For IPD: IPD has a mean Return on Capital Employed (ROCE) of 2.3107 i.e 2.3%, indicating that, on average, the company generated 2.31 units of profit for every 100 units of capital employed during the observed period. The high standard deviation of 4.08 suggests considerable variability in ROCE for IPD, implying that its capital efficiency has fluctuated significantly. The mean EBITDA Margin for IPD is 0.1517, signifying that, on average, 15.17% of IPD's revenue translates into earnings before interest, taxes, depreciation, and amortization. The very low standard deviation of 0.006526 indicates a remarkably consistent EBITDA margin, suggesting stable operational profitability.

Correlations				
Company			ROCE (%)	EBITDA Margin (%)
IPD	Pearson Correlation	ROCE (%)	1.000	.663
		EBITDA Margin (%)	.663	1.000
	Sig. (1-tailed)	ROCE (%)	.	.269
		EBITDA Margin (%)	.269	.
	N	ROCE (%)	3	3
		EBITDA Margin (%)	3	3
Varroc	Pearson Correlation	ROCE (%)	1.000	.985
		EBITDA Margin (%)	.985	1.000
	Sig. (1-tailed)	ROCE (%)	.	.055
		EBITDA Margin (%)	.055	.
	N	ROCE (%)	3	3
		EBITDA Margin (%)	3	3

Fig 4: Pearson's Correlation Table (Output from SPSS)

For Varroc: Varroc shows a mean ROCE of 0.2021, which is significantly lower than IPD's. This indicates that Varroc generates a much lower profit for every unit of capital employed compared to IPD. The standard deviation of 0.08550 suggests relatively less variability in ROCE for Varroc compared to IPD. Varroc's mean EBITDA Margin is 0.1105, which is lower than IPD's 0.1517. This suggests that Varroc retains a smaller percentage of its revenue as operating profit before non-operating expenses. The standard deviation of 0.027 indicates a reasonably consistent EBITDA margin, although with slightly more variability than IPD.

Pearson's Correlation

The Pearson Correlation between ROCE (%) and EBITDA Margin (%) for IPD is 0.663. This indicates a strong positive linear relationship between these two financial metrics. A positive correlation suggests that as IPD's EBITDA Margin increases, its ROCE also tends to increase, and vice versa. The p-value is of 0.269 which is greater than 0.05 which shows that there is no statistical significance. The Pearson Correlation between ROCE (%) and EBITDA Margin (%) is 0.985. This indicates that there's an extremely strong positive linear relationship between these two financial metrics. This suggests that for Varroc, almost all increases in EBITDA Margin are associated with proportional increases in ROCE. The p-value of 0.055 is

very close to the 0.05. As it exceeds 0.05, it suggests that there's a borderline significance. This implies that while the correlation is very high, there's still a slightly higher

probability (compared to IPD) that such a strong relationship could occur by considering the large sample size.

Model Summary ^b											
Company	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
IPD	1	.663 ^a	.440	-.120	4.321355065	.440	.786	1	1	.538	2.638
Varroc	1	.985 ^a	.970	.941	.0208192909	.970	32.733	1	1	.110	2.731

a. Predictors: (Constant), EBITDA Margin (%)
b. Dependent Variable: ROCE (%)

ANOVA ^a						
Company	Model		Sum of Squares	df	Mean Square	Sig.
IPD	1	Regression	14.670	1	14.670	.786
		Residual	18.674	1	18.674	
		Total	33.344	2		
Varroc	1	Regression	.014	1	.014	32.733
		Residual	.000	1	.000	
		Total	.015	2		

a. Dependent Variable: ROCE (%)
b. Predictors: (Constant), EBITDA Margin (%)

Fig 5: Model Summary and ANOVA (Output from SPSS)

Model Summary

For IPD: The R (Correlation Coefficient) is of 0.663 shows a moderate positive correlation between EBITDA Margin and ROCE for IPD. The R square of 0.440 shows that about 44.0% of the variation in ROCE can be explained by the changes in EBITDA Margin. This suggests a moderate explanatory power. The Adjusted R Square is of -.120, this negative value is due to the smaller sample size, which implies that the model is not generalized model. The Standard Error of Estimate is of 4.32, this shows that the average deviation of the actual ROCE values from the predicted ones. A standard error of 4.32% is moderately

high, again reflecting small sample limitations. The Durbin Watson Statistic is of 2.638, which is close to 2 indicating that there is no significant Autocorrelation in the residuals.

ANOVA Table

The F-statistic value is 0.786 which shows overall strength of the model. The p-value of 0.538 is very high than the 0.05 which show that model is not statistically significant model. This means that we fail to reject the null hypothesis of EBITDA Margin does not significantly influence ROCE for IPD at the 5% level.

Coefficients ^a										
Company	Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics Tolerance VIF
			B	Std. Error				Lower Bound	Upper Bound	
IPD	1	(Constant)	-60.648	71.076		-.853	.550	-963.759	842.463	
		EBITDA Margin (%)	414.977	468.195	.663	.886	.538	-5534.003	6363.956	1.000
Varroc	1	(Constant)	-.145	.062		-2.345	.257	-.931	.641	
		EBITDA Margin (%)	3.142	.549	.985	5.721	.110	-3.835	10.119	1.000

a. Dependent Variable: ROCE (%)

Fig 6: Coefficients Table (Output from SPSS)

Coefficients Table

For IPD: The Unstandardized Coefficients (B) of Constants is of -60.648 which indicates the predicted value when the EBITDA Margin (independent variable) is zero. The coefficient for EBITDA Margin is 414.977, which suggests that for every 1 increase in EBITDA Margin, ROCE increases by 414.977% which is economically implausible, holding other factors constant. The positive value shows a slight increase in ROCE with increase in EBITDA Margin. But this relationship is not statistically significant as the p-value (Sig.) of 0.538 is exceeding the conventional level of 0.05. The Standard Error for Constant is 71.076 and for EBITDA Margin it is very high of 468.195. This indicates a high degree of variability in estimating the constant and slope. This level of standard error reflects potential instability in the regression estimates due to the small sample size. The Standardized Coefficient (Beta) for

Constant is of 0.663 which indicates a moderate positive relationship between EBITDA Margin and ROCE in terms of standardized (z-score) units. This means that for a 1 standard deviation increase in EBITDA, FCFF increases by only 0.663 standard deviations. The t-statistics and Significance of EBITDA is of 0.886 and 0.538 respectively. This p value of 0.538 is very high than 0.05 which suggests that the coefficient is not statistically significant at any conventional level. The t-statistics and Significance of Constants is of -.0853 and 0.550 respectively. Even the constant term is not statistically significant. The Confidence Intervals ranges from -5534.003 to 6363.956. This interval includes zero, confirming that the true population slope could be zero, reinforcing the insignificance of the relationship. The Tolerance and VIF of 1.000 indicates that there is no Multicollinearity problem as there is only one predictor variable.

Coefficient Correlations ^a				
Company	Model		EBITDA Margin (%)	
IPD	1	Correlations	EBITDA Margin (%)	1.000
		Covariances	EBITDA Margin (%)	219206.427
Varroc	1	Correlations	EBITDA Margin (%)	1.000
		Covariances	EBITDA Margin (%)	.302

a. Dependent Variable: ROCE (%)

Fig 7: Coefficient Correlation Table (Output from SPSS)

For Varroc: The Unstandardized Coefficients (B) of Constants is of -0.145 which indicates the predicted value when the EBITDA Margin (independent variable) is zero. The coefficient for EBITDA Margin is 3.142, which suggests that for every 1 increase in EBITDA Margin, ROCE increases by 3.142% which is reasonable, holding other factors constant. The positive value shows a slight increase in ROCE with increase in EBITDA Margin. But this relationship is not statistically significant as the p-value (Sig.) of 0.110 is exceeding the conventional level of 0.05. The Standard Error for Constant is 0.62 and for EBITDA Margin it is low of 0.549. This indicates a low degree of variability in estimating the constant and slope. This level of standard error reflects potential instability in the regression estimates due to the small sample size. The Standardized Coefficient (Beta) for Constant is of 0.663 which indicates a moderate positive relationship between EBITDA Margin and ROCE in terms of standardized (z-score) units. This means that for a 1 standard deviation increase in EBITDA, FCFF increases by only 0.663 standard deviations. The t-statistics and Significance of EBITDA is of 5.721 and 0.110 respectively. This p value of 0.110 is not very high than 0.05 but it still suggests that the coefficient is not statistically significant at any conventional level. The t-statistics and Significance of Constants is of -2.345 and 0.257 respectively. Even the constant term is not statistically significant.

The Confidence Intervals ranges from -3.835 to 10.119. This interval includes zero, confirming that the true population slope could be zero, reinforcing the insignificance of the relationship. The Tolerance and VIF of

1.000 indicates that there is no Multicollinearity problem as there is only one predictor variable.

Coefficient Correlation

Correlations For IPD: The correlation value for EBITDA Margin (%) is 1.000. This indicates a perfect positive correlation between EBITDA Margin (%) and itself. This is an expected mathematical identity, as any variable will always have a perfect positive correlation with itself. However, given the explicit "Correlations" label and a value of 1.000, it strictly indicates a perfect self-correlation.

Covariance For IPD: The covariance value for EBITDA Margin (%) is 219206.427. A positive covariance indicates that as one variable increases, the other tends to increase. A large positive variance of 219206.427 suggests a very wide dispersion or high variability in IPD's EBITDA Margin (%) values. This implies that IPD's operational profitability, as measured by EBITDA Margin, has experienced substantial fluctuations during the 3-year period.

Correlation For Varroc: The correlation value for EBITDA Margin (%) is 1.000. This indicates a perfect positive correlation between EBITDA Margin (%) and itself. This is an expected mathematical identity, as any variable will always have a perfect positive correlation with itself. However, given the explicit "Correlations" label and a value of 1.000, it strictly indicates a perfect self-correlation.

Covariance For Varroc: The covariance value for EBITDA Margin (%) is 0.302. A positive covariance indicates that as one variable increases, the other tends to increase. A large positive variance of 0.302 suggests a very small dispersion or very low variability in Varroc's EBITDA Margin (%) values as compared to IPD's values. This implies that Varroc's operational profitability, as measured by EBITDA Margin, has experienced very less fluctuations during the 3-year period and its remarkably stable and consistent compared to IPD.

Collinearity Diagnostics

Collinearity Diagnostics ^a						
Company	Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	EBITDA Margin (%)
IPD	1	1	1.999	1.000	.00	.00
		2	.001	56.959	1.00	1.00
Varroc	1	1	1.981	1.000	.01	.01
		2	.019	10.195	.99	.99

a. Dependent Variable: ROCE (%)

Residuals Statistics ^a						
Company		Minimum	Maximum	Mean	Std. Deviation	N
IPD	Predicted Value	-.805479646	4.096642494	2.310754180	2.708332485	3
	Residual	-2.89646554	3.193202734	.000000000	3.055659470	3
	Std. Predicted Value	-1.151	.659	.000	1.000	3
	Std. Residual	-.670	.739	.000	.707	3
Varroc	Predicted Value	.1059398875	.2626742721	.2021266415	.0842260472	3
	Residual	-.015816418	.0133028477	.000000000	.0147214618	3
	Std. Predicted Value	-1.142	.719	.000	1.000	3
	Std. Residual	-.760	.639	.000	.707	3

a. Dependent Variable: ROCE (%)

Fig 8: Collinearity Diagnostics and Residual Statistics (Output from SPSS)

For IPD: For the Dimension 1, Eigenvalue is 1.999 which denotes the majority of variance. The second Dimension Eigenvalue is 0.001 which is very small and indicates near linear dependence which is often scrutinized for multicollinearity. The Condition index is the square root of the ratio of the largest eigenvalue to each successive eigenvalue. A value above 10 is usually a threshold for moderate multicollinearity and the values above 30 suggest the severe multicollinearity. In this case the maximum condition index is 56.959, indicating the severe issue of multicollinearity.

For Varroc: For the Dimension 1, Eigenvalue is 1.981, which denotes the majority of variance. The second Dimension Eigenvalue is 0.019 which is very small and indicates near linear dependence which is often scrutinized for multicollinearity. The Condition index is the square root of the ratio of the largest eigenvalue to each successive eigenvalue. A value above 10 is usually a threshold for moderate multicollinearity and the values above 30 suggest the severe multicollinearity. In this case the maximum condition index is 10.195, indicating the moderate multicollinearity issue. The Variance Proportions for both Dimensions 2 is nearly 99% of variance in both constant and EBITDA Margin. But since the Condition index is >10 , there is critical issue of Multicollinearity. In case of Varroc the issue is not that critical compared to IPD. This tell us that the IPD model is highly unstable. But this issue is due to low statistical significance due to its lower sample size.

Residual Statistics Table

For IPD: Predicted FCFF values are with a minimum range of -0.8054 and maximum range of 4.0966, with a small standard deviation of 2.70, suggesting a narrow prediction range. It shows a very small residuals ranging from -2.8964 to 3.1932 and a low residual standard deviation of 3.055. The standardized predicted values range from -1.151 to 0.659. The Standardized residuals range from -0.670 to 0.739. These are well within 1 which shows that no outliers are detected.

For Varroc: Predicted FCFF values are tightly clustered with a minimum range of 0.1059 and maximum range of 0.2626, with a very low standard deviation of 0.0842, suggesting a high volatility in prediction range. It shows very small residuals ranging from -0.0158 to 0.01330 and a very low residual standard deviation of 0.14721. The standardized predicted values range from -1.142 to 0.719. The Standardized residuals range from -0.760 to 0.639. These are well within 1 which shows that no outliers are detected. However, for Varroc, this aligns better with the actual residual range and supports a well-behaved residual pattern as there is Standard Deviation of 0.707. For IPD, the regression model signifies the high residual variability, wide prediction spread, and unstable estimation, signalling a poor fit and unreliable predictive performance. While in contrast, Varroc's model demonstrates minimal residual error, narrow prediction range, and excellent consistency, suggesting a much stronger and more reliable regression model despite the small sample size. Hence, we can validate that the Varroc's EBITDA Margin is a more consistent and dependable predictor of ROCE, while IPD's model lacks stability and suffers from excessive variance, likely due to limited data and volatility. This can be overcome by

considering the higher sample size and by using more advance volatility models.

Graph Interpretation

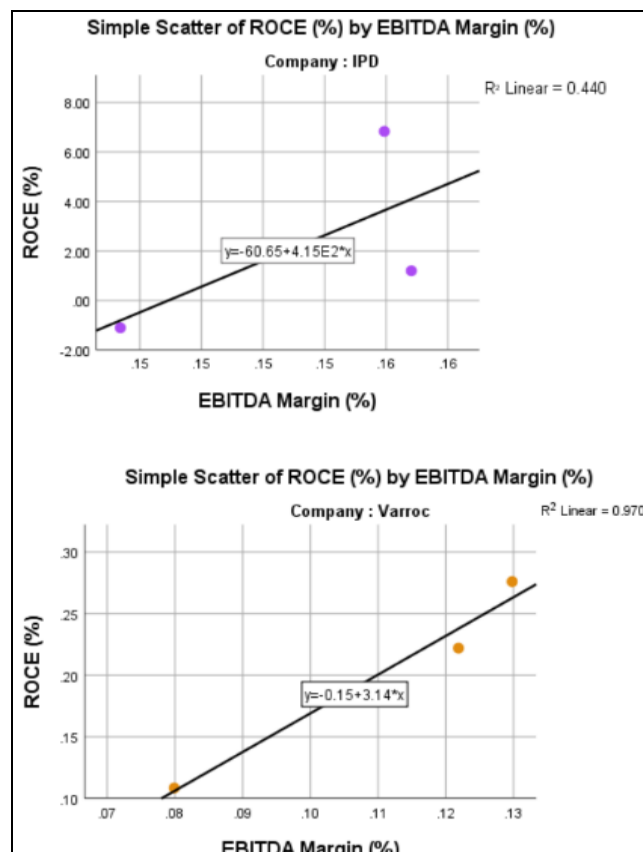


Fig 9: Scatter Plots (Output from SPSS)

For IPD: $ROCE = -60.648 + 414.977 \cdot \text{EBITDA Margin}$
The Intercept (Constant) is of -60.648 and EBITDA Margin Coefficient is 414.977. The Equation in the graph is the, $y = -60.65 + 415.2 \cdot x$. The Slope ($b = 414.97$) is positive but extremely small. For every 1 unit increase in EBITDA Margin, ROCE increases by only 414.977%.

For Varroc: $ROCE = -0.145 + 3.142 \cdot \text{EBITDA Margin}$
The Intercept (Constant) is of -0.145 and EBITDA Coefficient is 3.142. The Equation in the graph is the, $y = -0.15 + 3.14 \cdot x$. The Slope ($b = 3.142$) is positive: For every unit increase in EBITDA Margin, ROCE increases by 3.14%.

Null Hypothesis: There is no significant difference in Inventory Days between IPD and Varroc, and there is no significant negative correlation between Inventory Days and Gross Profit Margin within either company.

Alternate Hypothesis: IPD has significantly lower Inventory Days than Varroc, and there exists a significant negative correlation between Inventory Days and Gross Profit Margin within at least one company. The method used to test this hypothesis is Wilcoxon Signed Rank Test. This was done to know whether there is significant difference between the Inventory Days of Varroc and IPD. This is a Non-Parametric Test which we have done due to smaller sample size.

Descriptive Statistics				
Company		Mean	Std. Deviation	N
IPD	Inventory Days	19.26623090	5.349587167	3
	Gross Profit Margin	.2030675504	.0047755958	3
Varroc	Inventory Days	28.34704429	5.226605151	3
	Gross Profit Margin	.3542398215	.0267911144	3

Correlations				
Company			Inventory Days	Gross Profit Margin
IPD	Inventory Days	Pearson Correlation	1	-.654
		Sig. (2-tailed)		.546
		N	3	3
	Gross Profit Margin	Pearson Correlation	-.654	1
		Sig. (2-tailed)	.546	
		N	3	3
Varroc	Inventory Days	Pearson Correlation	1	-.257
		Sig. (2-tailed)		.834
		N	3	3
	Gross Profit Margin	Pearson Correlation	-.257	1
		Sig. (2-tailed)	.834	
		N	3	3

Fig 10: Descriptive Statistics and Pearson's Correlation (Output from SPSS)

Descriptive Statistics

For IPD and Varroc Polymers: The Mean Inventory days for IPD is 19.266, with a standard deviation of 5.350. This indicates that, on average, IPD holds inventory for approximately 19 days, and there's some variability around this mean which is of 5.350 days. The Mean Gross Profit margin is of 0.203 or 20.3%. It has very low Standard Deviation of 0.005 which suggests that IPD has relatively stable Gross Profit Margin within the limited sample size. The Mean Inventory days for Varroc is 28.347, with a standard deviation of 5.227. This indicates that, on average, Varroc holds inventory for approximately 28 days which is longer than IPD's Inventory days, and there's some variability around this mean which is of 5.227 days. The

Mean Gross Profit margin is of 0.345 or 34.5%, which is higher than the IPD's Gross Profit Margin. It has very low Standard Deviation of 0.027, though it is higher than IPD, it suggests that Varroc has slight variability in the Gross Profit Margin within the limited sample size.

Pearson's Correlation

For IPD: The Pearson Correlation between Inventory Days and Gross Profit Margin for IPD is -0.654. This value suggests that there is moderate negative correlation between the Inventory days and Gross Profit Margin. This means that as Inventory days increases, the Gross Profit Margin tends to reduce moderately. The p-value of 0.546 suggests that the model is not statistically significant at the value is greater than conventional level of 0.05.

For Varroc: The Pearson Correlation between "Inventory Days" and "Gross Profit Margin" for IPD is -0.246. This value suggests that there is low negative correlation between the Inventory days and Gross Profit Margin. This means that as Inventory days increases, the Gross Profit Margin tends to reduce moderately. The p-value of 0.546 suggests that the model is not statistically significant at the value is greater than conventional level of 0.05. The descriptive statistics show that Varroc generally has higher inventory days and a significantly higher gross profit margin than IPD. Both companies exhibit negative correlations between inventory days and gross profit margin, suggesting that longer inventory holding periods might be associated with lower gross profit margins. However, it is crucial to note that none of the correlations are statistically significant for either company due to the extremely small sample size of $n=3$. This limitation means that any conclusions drawn from these correlations should be interpreted with extreme caution, as the observed relationships could be due to random chance. Further research has to be done with the larger sample size for more accurate results.

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Inventory Days Varroc	28.3467	3	5.22967	3.01935
	Inventory Days IPD	19.2667	3	5.34843	3.08792

Paired Samples Correlations			
		N	Correlation
Pair 1	Inventory Days Varroc & Inventory Days IPD	3	.708

Paired Samples Test								
		Paired Differences						
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	Sig. (2-tailed)
Pair 1	Inventory Days Varroc - Inventory Days IPD	9.08000	4.04538	2.33560	Lower	Upper		
					-.96928	19.12928	3.888	.060

Fig 11: Paired Samples Statistics, Correlation and Paired Differences (Output from SPSS)

Paired Samples t-test

The Pearson correlation coefficient of 0.708. This indicates a strong positive linear relationship between the inventory days of Varroc and IPD across the 3-year period. This correlation is different from the above correlation. This

correlation is between the companies, which is inter-company operational similarity. This value shows that are the two companies behave similarly or not. The p-value we've got is 0.499 which is much higher than 0.05. This shows the statistical insignificance in this model.

Paired Samples Test Table

The mean difference in the inventory days between Varroc and IPD is 9.08 days, with Varroc having a higher value. The t-value of 3.888 and the df of 2 suggests the strength of the difference. The p-value of 0.060 suggests that the value is slightly above the conventional level of 0.05. This

indicates the marginally nonsignificant difference in the Inventory days between the two. The 95% Confidence Interval for the difference is of -0.9692 to 19.129 which includes 0. This represents that the relationship difference is not statistically significant.

Wilcoxon Signed Ranks Test				
		Ranks		
		N	Mean Rank	Sum of Ranks
Inventory Days IPD - Inventory Days Varroc	Negative Ranks	3 ^a	2.00	6.00
	Positive Ranks	0 ^b	.00	.00
	Ties	0 ^c		
	Total	3		
a. Inventory Days IPD < Inventory Days Varroc b. Inventory Days IPD > Inventory Days Varroc c. Inventory Days IPD = Inventory Days Varroc				
Test Statistics ^a				
Inventory Days IPD - Inventory Days Varroc				
Z			-1.604 ^b	
Asymp. Sig. (2-tailed)			.109	
a. Wilcoxon Signed Ranks Test				
b. Based on positive ranks.				

Fig 12: Ranks and Test Statistics of Wilcoxon Signed Rank Test. (Output from SPSS)

The Wilcoxon Signed-Rank Test

The Wilcoxon Signed-Rank Test is a non-parametric alternative to the Paired t-test, used when the assumption of normality is not met or the sample size is too small ($n < 30$). It compares the median of differences between paired observations to test whether the distribution of differences is symmetric around zero. In our case, it measures or evaluates whether there is a statistically significant difference between the Inventory Days of Varroc and IPD. According to the results, in all 3 cases, IPD had fewer inventory days than Varroc, which is mentioned in the Negative Ranks. This row indicates instances where Inventory Days IPD is less than Inventory Days Varroc. None of the observations showed IPD having more inventory days than Varroc, which is mentioned in the Positive Ranks. This row of Positive Ranks indicates instances where Inventory Days IPD is greater than Inventory Days Varroc. And there are no equal values recorded, which has been mentioned in the Ties. This row indicates instances where Inventory Days IPD is equal to Inventory Days Varroc. Across all 3 time points, Varroc consistently maintained higher Inventory Days than IPD. This implies that IPD is more efficient in inventory turnover compared to Varroc during the observed period.

Test Statistics

The Z-value of -1.604. This negative value indicates that the sum of negative ranks is larger (or, in this case, the sum of positive ranks is smaller, leading to a negative Z when based on positive ranks as indicated by footnote 'b'). This indicates that there is stringer direction towards IPD having the lower inventory days. The Asymptotic p-value of 0.109 is greater than 0.05, which tells us that the results are not statistically significant at 0.05 level. Hence, we fail to reject the null

hypothesis. Therefore, there is no statistically significant difference in inventory days between IPD and Varroc based on this small sample size.

Conclusion

Although the direction of the difference was consistent (with Varroc maintaining poorer inventory efficiency), the result was not statistically significant at the 5% level. This lack of significance may be attributed to the extremely small sample size of $n = 3$, which limits the power of non-parametric tests. Nonetheless, the data suggests that IPD may maintain more efficient inventory management than Varroc.

Findings

Null Hypothesis: There is no significant difference in the average Current Ratio between Varroc and IPD.

Alternative Hypothesis: Varroc has a significantly higher average Current Ratio than IPD.

As hypothesis aimed to evaluate whether Varroc has higher Average Current Ratio than IPD over 3-year period. Levene's Test for Equality of Variances indicated the p-value of 0.120, which is greater than 0.05. This justifies that there is use Equal Variances Assumed row in the Independent Samples t-test. As the hypothesis is directional hypothesis, the p-value of 0.001 was computed. This confirms the significance of 5% level. The 95% Confidence Interval for the Mean difference ranges from 0.4220 to 0.8601. As this range excludes 0, it further validates that Varroc's Current Ratio is higher than IPD's Current ratio. Hence, we reject the Null Hypothesis.

Null Hypothesis: There is no significant difference in the Operating Cash Flow Ratio between Varroc and IPD.

Alternative Hypothesis: There is a significant difference in the Operating Cash Flow Ratio between Varroc and IPD. Based on the descriptive statistics, the Mean OCF Ratio for Varroc is 0.3865 and the Standard Deviation of 0.2078. This is higher than that of IPD's Mean OCF Ratio of 0.2466 and the Standard Deviation of 0.2096. The p-value we got is 0.458 which is much higher than 0.05. This indicates that the observed means are not statistically significant. Also, the significance value of Levene's Test is 0.986, which is way higher than 0.05. The 95% confidence interval for mean differences ranges from -0.333 to 0.6130. As this includes 0, it confirms that there lacks statistical significance. Hence, we accept the Null hypothesis that there is no significant difference in the Operating Cash Flow Ratio between Varroc and IPD.

3. Null Hypothesis: EBITDA Margin does not significantly predict ROCE for IPD and Varroc

Alternate Hypothesis: EBITDA Margin significantly predicts ROCE for IPD and Varroc

Based on the Regression Analysis we got an unstandardized coefficient (B) of 414.977 for the EBITDA Margin. This indicated the positive relationship between EBITDA Margin and ROCE in case. However, the p-value of 0.538 was much higher than 0.05 which shows statistical insignificance. The R Square value is 0.440 which shows only 44% of variance in ROCE is explained by EBITDA Margin. Also, the Regression line shows that the model is poor fit model. Hence, based on the output we got, we Accept the Null Hypothesis. Thus, EBITDA Margin does not statistically impact ROCE in case of IPD during the 3-year period. Based on the Regression Analysis we got an unstandardized coefficient (B) of 3.142 for the EBITDA Margin. This indicated the positive relationship between EBITDA Margin and ROCE in case. However, the p-value of 0.110 was higher than 0.05 which shows mere statistical insignificance. This is possibly due to the limited sample size of n=3. The R Square value is 0.970 which shows that 97% of variance in ROCE is explained by EBITDA Margin. Also, the Regression line shows that the model is strong fit model. Hence, based on the output we got, we Accept the Null Hypothesis. Thus, EBITDA Margin does not statistically impact ROCE in case of IPD during the 3-year period.

4. Null Hypothesis: There is no significant difference in Inventory Days between IPD and Varroc, and there is no significant negative correlation between Inventory Days and Gross Profit Margin within either company.

Alternate Hypothesis: IPD has significantly lower Inventory Days than Varroc, and there exists a significant negative correlation between Inventory Days and Gross Profit Margin within at least one company.

The results showed that in all the three paired observations, Varroc had higher Inventory Days compared to IPD. It has no ties or any instances that IPD is exceeding Varroc. The Test has produced the z-value of -1.604 and the p-value of 0.109. This shows no statistical significance, and the model is poor fit model. Although the direction was consistent in

case of Varroc having the poor inventory days, the result is not statistically significant. This is due to limited size of the sample. Therefore, we have Accepted the Null Hypothesis and concluded that there is no significant difference in Inventory Days between IPD and Varroc, and there is no significant negative correlation between Inventory Days and Gross Profit Margin within either company. Though IPD has outperformed the Varroc in maintaining its Inventory Days, IPD still lacks the statistical significance due to limited sample size.

Recommendations

1. Null Hypothesis: There is no significant difference in the average Current Ratio between Varroc and IPD.

Alternative Hypothesis: Varroc has a significantly higher average Current Ratio than IPD.

IPD has lower Current Ratio which reflects that IPD has relatively constrained capacity to meet its short-term obligations. It is recommended that IPD should increase its Current Assets. It should focus more on the short-term investments, trade receivables, etc. Lowering the Current Liabilities in case of IPD can make huge difference. This will improve the company's liquidity position. IPD must evaluate payables and Inventory to improve the working capital. Also, IPD must focus on improving the Inventory Turnover Ratio which has direct impact on Current Ratio. Varroc's Current Ratio is quite healthy, it is important for Varroc to ensure that it is not rising excessively. Any abnormal increase in this ratio will indicate that the capital allocation is inefficient in this company. It is advised to maintain the ratio ideally between the 1.5 to 2.5. If Varroc has higher assets, it should invest those in Research and Development, expansions and adapt advanced technologies for better efficiency. Also company should focus on improving and managing its working capital.

2. Null Hypothesis: There is no significant difference in the Operating Cash Flow Ratio between Varroc and IPD.

Alternative Hypothesis: There is a significant difference in the Operating Cash Flow Ratio between Varroc and IPD.

As IPD has lower OCF ratio, they should focus on the increasing their cash inflows through their primary business activities. This can be done by improving their Inventory days and improving the production efficiency. IPD must improve its Receivables and inventory so that they can strengthen their working capital. They have to realign their working capital policies which can free up more operating cash. IPD should focus on Cash Flow Monitoring. This can be done by continuous forecasting of the cashflows to detect the inefficiencies and take the corrective actions. Another is that they must link their Revenue to the Cash Flow realization. This can be done by avoiding the revenue growth strategies that dilute the Operating cash inflows such as pricing very low or below the cost, excessive credit sales, etc. Instead of this, they must aim for the higher revenue that will improve their cash.

Although Varroc has higher OCF Ratio, they show operational inefficiencies due to higher viability. They should focus on improving their Working Capital and minimizing the fluctuations in their cashflows. Another is that they must tighten their Receivables days by adopting strict credit policies. They must review the raw material

sourcing strategies, logistics, overheads, etc, this will lead to increasing the Cash conversion from the Revenues. They must ensure that they are reinvesting their excess operational cash in the technological upgradation, automation, etc to reduce the future cash outflows. Doing this will also give them a competitive advantage.

3. Null Hypothesis: EBITDA Margin does not significantly predict ROCE for IPD and Varroc

Alternate Hypothesis: EBITDA Margin significantly predicts ROCE for IPD and Varroc

IPD should primarily concentrate on lowering their operating expenses. This can be done by adopting lean manufacturing practices, investing in automation, effectively managing their waste materials, and optimizing production processes, among other strategies. IPD ought to implement various tactics to enhance its top-line growth while preserving their profit margins. Additionally, IPD can delegate the non-core functions to third-party providers to boost cost efficiency. It is essential for IPD to perform an Asset Efficiency Audit to pinpoint assets that are not performing well. As mentioned earlier, IPD should aim to enhance inventory turnover by optimizing their working capital. Instead of purchasing long-term assets, IPD can consider outsourcing these assets. They can increase EBITDA by employing diverse strategies and offering higher-value products.

Varroc can improve EBITDA by minimizing overhead costs and boosting their production processes through automation. Varroc should also establish operational KPIs that will reward the team based on improvements in the EBITDA. It is vital for Varroc to maintain a healthy Asset Turnover Ratio by strengthening capacity planning to ensure that assets are in line with actual demand. Furthermore, they should consider selling or leasing any assets that are either unused or underutilized. This will not only generate short-term capital but also enhance their overall efficiency.

4. Null Hypothesis: There is no significant difference in Inventory Days between IPD and Varroc, and there is no significant negative correlation between Inventory Days and Gross Profit Margin within either company.

Alternate Hypothesis: IPD has significantly lower Inventory Days than Varroc, and there exists a significant negative correlation between Inventory Days and Gross Profit Margin within at least one company.

Varroc must increase its Inventory Turnover Ratio by integrating the lean inventory practice, optimizing their reorder points and continuously forecasting the demands. As Varroc is having the higher Inventory Days, it might be contributing the Gross Profit Margins to suppress. This is due to the increased inventory costs, warehousing, etc. Varroc must streamline their procurements, focus extremely on higher margin product segment, negotiate for better pricing of the raw material, etc. Ensuring these steps will increase their Gross margins. As there is weak negative correlation of -0.257 between the Inventory Days and Gross Profit Margins, it suggests that the existing operational efficiencies are not significantly impacting Varroc's profitability. They must focus on implementing the SKU Rationalization, Just-In-Time (JIT) for aligning the production with the demand. This will improve both efficiency in its process and

productivity also.

IPD should maintain its Inventory days without having any volatilities. This can be done through avoiding the stockouts, focusing on the demand driven planning model. As IPD shows relatively low Gross Profit Margins, it also shows moderate negative correlation of -0.654 which indicates that better Inventory control is not translating into the profitability. To ensure this, IPD must evaluate its pricing strategies, reduce giving the discounts, increase product differentiation, reduce the costs, etc improves the overall efficiency. IPD can implement the KPIs that are directly linked to the Supply Chain efficiency, which will improve their margin performance. This approach will facilitate the formulation of inventory strategies that can optimize the turnover and will be cost effective for IPD.

Research Limitations

This research has limited time horizon. As it is constrained to 3-yr period, it does not capture the long-term cyclical patterns and volatility. Due to this long-term trend and their impact does not show any impact on the financial performance. The research relies on the historical data which may not be enough for future analysis especially while dealing with market disruptions, technological advancements, etc. The study focuses on only 2 companies which may limit the generalizability of the findings. Another limitation of this research is the limited samples of the companies. This study focuses on just 2 companies which may limit the statistical significance. TACO IPD and Varroc Polymer, both operate in different segments which can vary the model results, as the products they possess are also different.

There are multiple Methodological limitations which are considered such as the statistical assumptions. It is assumed that there exists the Normal Distribution, Independence and Homogeneity of Variance. Any violations in these may result to change the validity of test results. Another is that to know the Causal relationship and the Correlations, we must consider the external factors also, but we haven't considered any. Another limitation is that the econometric model suffers from the omitted variable bias if the significant explanatory variables are not included in the analysis due to the less availability of the data. There are some assumptions which we have done for calculating the data and testing these hypotheses:

1. We have assumed Risk Free Rate 7% considering the Indian Government Bond Yield.
2. We have assumed Risk Premium of 6% ($R_m - R_{ft}$)
3. We have assumed the Beta of 1.20 which is like the Auto ancillaries Beta.
4. We have considered the Book Value of Equity for the calculations.
5. We have considered the growth rate of 9%
6. We have considered Tax of 25%.

These are some of the assumptions which have been considered for this research. Above are the limitations which can be overcome by considering necessary data for further studies.

Conclusion

The present study provides a comparative analysis of TACO IPD vs Varroc Polymers from the perspective of financial health and performance in Indian auto component manufacturing sector. The result indicated that while Varroc

has stronger liquidity position as demonstrated in the Current Ratio, IPD is more efficient in terms of inventory management. EBITDA Margin arguably influenced ROCE and FCFF directionally, however strong statistical Evidence for this was lacking due to the small sample size. Even though the operating cash flow ratio and the receivable days behave as expected their statistical insignificance Signifies the need for longer horizon overall the study highlights the nuanced relationship between Operational Efficiency, Capital Structure and Value Creation in Indian Manufacturing firms.

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