

Operational Efficiency and Financial Resilience: Optimizing Working Capital in Manufacturing Firms – A Kennametal India Case Study

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ABSTRACT

This study looks at working capital management (WCM) practices at Kennametal India Ltd. with a view to establishing a relationship between key components-inventory, receivables, and payables-and company profitability. Both descriptive and analytical research designs were employed, with the collection of data through interviews and document analysis. The study is based on five years financial statements, which were statistically analyzed. Findings suggest that working capital goes hand in hand with sales; however, increases in working capital are also accompanied by higher levels of inventory and accounts receivable, suggesting the likelihood of inefficiencies. Positive correlation analysis has shown the working capital components to have a mild negative relationship with net profit, meaning that an increase in working capital may have a detrimental effect on profitability. The regression results indicated that the cash conversion cycle and its components do not significantly affect return on assets. According to the study, a maximum of 50 days is the average time for cash collections from debtors. A hybrid approach to working capital management is being followed at Kennametal, involving a mix of conservative and aggressive strategies while carefully allocating resources in balancing risk and return. Trade credit policies improve relationships with associated suppliers and customers for further financial performance enhancement and make optimally efficient use of inventory management practice to allow the reduction of cash collection period. All this will go further reduction of operational cost thus maximizing profits in the long run while also leading to operational efficiency with a sense of competition.

KEYWORDS: Effectiveness, Investment for Working Capital, Inventory, Cash Cycle, Trade Credit, Financial Routine.

1. Introduction

The study is highly relevant within the manufacturing and industrial sector, where companies operate with substantial inventory levels, complex supply chains, and capital-intensive processes. In that context, optimally maintaining WCM becomes critical, as it has a direct effect on liquidity, cash flow, and profitability. Manufacturers like Kennametal depend on best-in-breed WCM practices to generate business continuity, lower variable costs, and foster cash conversion cycles since the industry is typically in a position of reduced profit margins and considerable fixed costs. The steadiness between aggressiveness and conservation WCM tactics is described in this study which takes us towards finding financial objectives, the

market demand and also the resource that are available in the firm. The study also demonstrates and finds that how Kennametal establishes that, the manufacturing firm should have to change their policies and strategies as per the situations that evolved. When seen the WCM also acts as a pathway towards improving operational efficiency and its competitive advantage in the present business environment, It also drives towards the enhancement of cash flow towards enabling reinvesting in the field of innovation and growth of the organization. This research paper also deals with recommendation for Kennametal to takeover advanced solutions with new technologies in the field of WCM and also reflects that the industry shifts towards the data driven management, where there is a use of digital related tools and also manages inventory management through optimizing payables and receivables. This enables in providing accurate forecasting. Its relativeness with ubiquitous industry practices provides highlights the implications of the study, which can provide guidelines to the so-called financial managers and various data analysts for providing and improving profitability and flexibility in the field of manufacturing industry. Various manufacturing firms (in this research paper Kennametal) need a focus on well-organized WCM in the field of cash flow, smooth operation and smooth operational costs. Effective WCM becomes a vital point towards undertaking the main components such as receivables and payables, inventory on working capital which gets directly linked to probability and liquidity. Any business sectors with a high fixed cost, where the profit margins are small along with unstable commodity prices, the firm has to keep close information on various management areas like rolling profits through avoiding various non-maintainable financial positions. In addition to the above the industry will also get exposed to larger liquidity risk during the stages of macroeconomic ambiguity from shifting demand and as well as supply chain management disruption. These perceptions will help the industries towards understanding how financial resilience can be attained and the role play of CCC towards facilitating market fluctuation adaptation. Taking it ahead the manufacturing firms gradually tries to employ data-driven systems towards WCM; this research study investigates the perception of advanced technologies for the further approaches which resonates with forthcoming trends that strengths with foreseeing inventory optimization and well organized working capital managements. In other way it also seems to act potentially as a wonderful reference for various manufacturing firms that are in the stage of developing towards improving their operational efficiency, flow of cash and their profits in the given competitive field of environment. Kennametal thus adopts a mixture of conservative and belligerent WCM strategies towards increasing their competitive advantages. Increase in financial performance, sustainable growth and profitability has been a crucial factor, which has been researched extensively with the effect of WCM in this paper. The literature studied below indicates and elaborates the key theme which follows the impact of WCM on various aspects like profitability, role of the manufacturing companies and their characteristics along with recommendations on effective WCM Practices.

2. Literature Review

2.1 The connection Between WCM and Profitability in manufacturing companies

A solid connection between WCM practices and profitability in the manufacturing companies has been widely established. Pambayun Kinasih et al. (2018) examined Indonesian manufacturing firms and found that while WCM had a minimal direct impact on sustainable growth; it indirectly enhanced growth by improving profitability. Similarly, Nastiti et al. (2019) identified a significant positive impact of WCM on profitability in Nigerian food and

beverage companies, underscoring the importance of skilled resource management for optimal financial performance. The role of the CCC has been highlighted in several studies. Ilker Yilmaz & Goksel Acar (2019) found that CCC components significantly influenced gross profit margin (GPM) and EBIT margin (EBITM) but had no notable effect on return on assets (ROA). Additionally, Sara Fernández-López et al. (2020) demonstrated that prolonged CCC and Days Inventory Outstanding (DIO) negatively impacted profitability in Spanish cheese-manufacturing firms, emphasizing the need for effective inventory control. In Polish dairy firms, Gołaś (2020) reported that extended DSI and CCC reduced ROA, while prolonged Days Sales Outstanding (DSO) and Days Payable Outstanding (DPO) improved financial performance. Furthermore, Somnath Das (2023) analyzed Indian FMCG firms and found that debtors' turnover, inventory turnover, and creditors' turnover positively influenced profitability, while CCC had a negative impact.

2.2 Industry-Specific Insights on WCM

The impact of WCM varies significantly across industries. Ajaya Kumar Panda & Swagatika Nanda (2018) found that while increased short-term debt improved profitability in chemical, construction, and consumer goods industries, reducing short-term borrowing enhanced profitability in machinery, metal, and textile sectors. Moreover, firms with strong financial flexibility and favorable price-cost margins could leverage short-term debt more effectively. Russell P. Boisjoly (2020) found that aggressive WCM strategies, such as better CCC, improved inventory turnover, and higher accounts receivable turnover, positively impacted financial performance, especially in the transportation and communications sectors. Similarly, Pirtila and Lind (2020) examined Russian automotive supply chains and discovered that firms with longer accounts payable periods, higher inventory levels, and shorter CCCs recorded stronger financial performance. Notably, the most profitable firms were those that paid suppliers on time. In the food and beverage sector, Arifani (2023) found that while cash and inventory turnover had a positive effect on profitability, accounts receivable turnover and current debt turnover had a negative yet statistically insignificant impact. Additionally, research by Murtiadi Awaluddin & Sri Prilmayanti Awaluddin (2020) indicated that while net working capital positively influenced cash holdings, its effect on profitability was not statistically significant.

2.3 Firm characteristics and WCM

Firm-specific characteristics such as size, ownership structure, and leverage play a crucial role in shaping the relationship between WCM and financial performance. Zalaghi and Godini (2019) explored this dynamic within firms listed on the Tehran Stock Exchange and found that business size moderated the link between the CCC and ROA. However, their study revealed no significant influence of government ownership or debt ratios on this relationship. During the COVID-19 pandemic, Murtiadi Awaluddin and Sri Prilmayanti Awaluddin (2020) examined these factors and observed that company size did not significantly impact profitability. Likewise, their findings suggested that while net working capital had a positive effect, this impact was statistically insignificant. Interestingly, profitability emerged as a mediating factor between net working capital and cash holdings, highlighting its intermediary role. In the context of emerging markets, Thiago Alvarez et al. (2021) analyzed manufacturing firms in Argentina and affirmed that WCM positively influenced profitability. However, excessive leverage was found to diminish financial performance. A similar pattern was identified by Amponsah-Kwatiah and Asiamah (2021) in Ghanaian manufacturing firms,

where effective management of inventory, receivables, payables, and the CCC contributed to improvements in ROA and return on equity (ROE), while leverage exerted a negative effect. The intricate nature of the WCM-profitability relationship was further explored by Sorin Gabriel Anton and Anca Elena Afloarei Nucu (2020), who identified an inverted U-shaped relationship. Their research suggested that while WCM initially enhanced profitability, excessive investment in working capital ultimately led to diminishing financial returns. This highlights the need for a balanced approach to WCM, ensuring that firms optimize their working capital without overextending their resources.

2.4 Strategic Recommendations for Effective WCM

Several studies provide practical recommendations for improving WCM practices to enhance profitability. Vani & Budiman (2023) emphasized the importance of integrating accounting information to manage cash flow, inventory, and current ratios efficiently. They recommended frequent monitoring of financial indicators to improve decision-making and mitigate risks.

In public institutions, Ombui et al. (2024) highlighted the need for tailored WCM strategies in Kenyan coastal universities. The study recommended focusing on cash management, improving receivables and payables management, optimizing inventory control, and aligning financial strategies with the size and operational needs of each institution. Lastly, Das (2023) recommended collaboration among sales, purchasing, and inventory management departments to streamline operations and improve cash flow efficiency. This integrated approach helps firms manage working capital more effectively, minimizing financial risks while enhancing profitability. Observing the lacunas in the major determinants of working capital components, conversion cycle of cash, and return on assets the objectives of our research work are stated below:

To analyse the fluctuations in working capital at Kennametal India Ltd. to better understand the company's liquidity status.

To assess how variations in working capital components affect the profitability of Kennametal India Ltd.

3. Methodology

The current research is a combination of descriptive and analytical research designs with the use of primary data and secondary data. Descriptive and Inferential statistical techniques are employed in the analysis to draw useful insights and implication to managers.

4. Results and Discussions

The study initially computed correlation estimates for all continuous variables, which were a prerequisite for the regression analysis. Table 1 presents these correlation estimates for the independent variables examined in the study.

Table 1. Correlation between Changes in Working Capital and Net Profit Ratio

		Changes in working capital	Net profit ratio
Changes in working capital	Pearson Correlation	1	0.596
	Sig. (2- tailed)		0.404
	N	4	4
Net profit ratio	Pearson Correlation	0.596	1

	Sig. (2- tailed)	0.404	
	N	4	5

Referring Table 1 we can see the correlation between changes in working capital and net profit ratio with sample size of 5. The correlation shows that there is moderate negative correlation that is 0.596 between these variables where we can conclude that working capital is increasing and net profit is decreasing in past five years. As P value $0.405 > 0.05$ (significance level) we reject null hypothesis (H_0). H_a : There is notable relationship between variations in working capital management and shifts in profitability.

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Working Capital Ratio	5	1.95	3.17	2.5380	0.19968	0.44651	0.199
Net Profit Ratio	5	5.54	11.39	8.5300	0.93829	2.09808	4.402

The sample size $N=5$ with mean is 2.5380 and 8.5300 respectively for working capital ratio and net profit ratio. The standard deviation of 0.19968 of WCR indicates a relatively moderate spread of the data around the mean whereas the standard deviation of 0.93829 suggests a higher degree of variability in net profit ratios compared to working capital ratios referring Table 2. The relatively small standard deviation for the working capital ratio indicates that the firms in the sample have a consistent level of liquidity. This could be a positive sign for financial stability. The larger standard deviation for the net profit ratio suggests that the firms in the sample have more variation in their profitability.

Table 3. Analysis of Variance

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.148	1	0.148	0.025	.884 ^b
Residual	17.460	3	5.820		
Total	17.608	4			
a. Dependent Variable: Net profit ratio					
b. Predictors: (Constant), working Capital ratio					

Referring Table 3, F value is 0.025 with p-value of 0.884 which is more than the significance value of 0.05. i.e, $F(1,3)=0.128$, $p>0.05$, Therefore, H_0 is accepted and H_1 is rejected and it is concluded that the working capital ratio does not significantly explain the variation in net profit ratio.

Table 4: Correlation between Working Capital Components and Return On Assets

		Days sales outstanding	Days inventory outstanding	Days payable outstanding	cash conversion cycle	Return on assets
Days sales outstanding	Pearson Correlation	1				
	Sig. (2-tailed)					
Days inventory outstanding	Pearson Correlation	-0.613	1			
	Sig. (2-tailed)	0.271				
Days payable outstanding	Pearson Correlation	0.738	-0.008	1		
	Sig. (2-tailed)	0.155	0.990			
Cash conversion cycle	Pearson Correlation	-0.894*	0.850	-0.532	1	
	Sig. (2-tailed)	0.041	0.068	0.356		
Return on assets	Pearson Correlation	0.707	-0.380	0.390	-0.507	1
	Sig. (2-tailed)	0.182	0.528	0.517	0.383	
*. Correlation is significant at the 0.05 level (2-tailed).						
b. Listwise N=5						

There's a strong negative correlation (-0.894) between DSO and CCC refer Table 4. This suggests that as the company takes longer to collect payments from customers (higher DSO), the overall cash conversion cycle increases. A moderate positive correlation (0.850) exists between DIO and CCC. This indicates that holding inventory for a longer period (higher DIO) contributes to a longer cash conversion cycle. There's a weak negative correlation (-0.532) between DPO and CCC. While a longer payment period to suppliers (higher DPO) can sometimes improve cash flow, in this case, it seems to have a limited impact on reducing the cash conversion cycle. A moderate positive correlation (0.707) exists between DSO and ROA. This suggests that companies with longer collection periods might have higher returns on assets. A weak negative correlation (-0.380) exists between DIO and ROA. This indicates that holding inventory for a longer period might have a slightly negative impact on returns on assets. A weak positive correlation (0.390) exists between DPO and ROA. This suggests that taking longer to pay suppliers might have a slightly positive impact on returns on assets. The summary of the model fit is shown in Table 5.

Table 5. Summary of model fit: Days Sales Outstanding and Return on assets

Model Summary								
R	R ²	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.707 a	0.500	0.333	3.77983	0.500	2.997	1	3	0.182
a. Predictors: (Constant), Days sales outstanding								

Table 6. Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	42.824	1	42.824	2.997	.182 ^b
Residual	42.861	3	14.287		
Total	85.685	4			
a. Dependent Variable: Return on assets					
b. Predictors: (Constant), Days sales outstanding					

Referring Table 6, F value is 2.997 with p-value of 0.182 which is more than the significance value of 0.05. i.e., $F(1,3)=0.182$, $p>0.05$, $R^2=0.500$ refer Table 6. Therefore, H_0 is accepted and H_1 is rejected and it is concluded that there is no statistically significant relationship between Days sales outstanding and return on assets. Model summary is shown in Table7.

Table 7. Days Inventory Outstanding and Return on Assets

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
	.380 ^a	0.145	-0.141	4.94284	0.145	0.507	1	3	0.528
a. Predictors: (Constant), Days inventory outstanding									

Table 8. Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	12.390	1	12.390	0.507	.528 ^b
Residual	73.295	3	24.432		
Total	85.685	4			
a. Dependent Variable: Return on assets					
b. Predictors: (Constant), Days inventory outstanding					

From Table 8, F value is 0.507 with p-value of 0.528 which is more than the significance value of 0.05. i.e., $F(1,3)=0.507$, $p>0.05$, $R^2=0.145$. Therefore, H_0 is accepted and H_1 is rejected and it is concluded that there is no statistically significant relationship between

Days Inventory outstanding and return on assets. Model summary is shown in Table 9.

Table 9. Days Payable Outstanding and Return on Assets

Model Summary								
R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.390 ^a	0.152	-0.131	4.92165	0.152	0.537	1	3	0.517
a. Predictors: (Constant), Days payable outstanding								

Table 10. Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	13.017	1	13.017	0.537	.517 ^b
Residual	72.668	3	24.223		
Total	85.685	4			
a. Dependent Variable: Return on assets					
b. Predictors: (Constant), Days payable outstanding					

Referring Table 10, F value is 0.537 with p-value of 0.517 which is more than the significance value of 0.05. i.e., $F(1,3)=0.537$, $p>0.05$, $R^2=0.152$. Therefore, H_0 is accepted and H_1 is rejected. and it is concluded that there is no statistically significant relationship between Days Payable outstanding and return on asset. Table 11 shows the model summary of cash conversion cycle and return on assets.

Table 11. Cash conversion Cycle and Return on Assets

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
	.507 ^a	0.257	0.009	4.60648	0.257	1.038	1	3	0.383
a. Predictors: (Constant), cash conversion cycle									

Table 12. Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.

	Regression	22.026	1	22.026	1.038	.383 ^b
	Residual	63.659	3	21.220		
	Total	85.685	4			
a. Dependent Variable: Return on assets						
b. Predictors: (Constant), cash conversion cycle						

Referring Table 12, F value is 1.038 with p-value of 0.383 which is more than the significance value of 0.05. i.e., $F(1,3)=1.038$, $p>0.05$, $R^2=0.257$. Therefore, H_0 is accepted and H_1 is rejected and it is concluded that there is no statistically significant relationship between CCC and Return on assets.

Table 13. Working Capital Investment Policy and Return on Assets

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
	.789 ^a	0.622	0.496	3.28443	0.622	4.943	1	3	0.113
a. Predictors: (Constant), WCIP									

Table 14. Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	53.323	1	53.323	4.943	.113 ^b
Residual	32.362	3	10.787		
Total	85.685	4			
a. Dependent Variable: Return on assets					
b. Predictors: (Constant), WCIP					

Referring Table 14, F value is 4.943 with p-value of 0.113 which is more than the significance value of 0.05. i.e., $F(1,3)=4.943$, $p>0.05$, $R^2=0.622$. Therefore, H_0 is accepted and H_1 is rejected and it is concluded that there is no statistically significant relationship between Working Capital Investment Policy and Return on assets. For model summary refer Table 15.

Table 15. Working Capital Financing Policy and Return on Assets

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change

	.399 ^a	0.159	-0.121	4.90064	0.159	0.568	1	3	0.506
a. Predictors: (Constant), WCFP									

Table 16. Analysis of Variance

Table 16. Analysis of Variance						
Model	Sum of Squares	df	Mean Square	F	Sig.	
Regression	13.636	1	13.636	0.568	.506 ^b	
Residual	72.049	3	24.016			
Total	85.685	4				
a. Dependent Variable: Return on assets						
b. Predictors: (Constant), WCFP						

Referring Table 16, F value is 0.568 with p-value of 0.506 which is more than the significance value of 0.05. i.e., $F(1,3)=0.568$, $p>0.05$, $R^2=0.159$. Therefore, H_0 is accepted and H_1 is rejected and it is concluded that there is no statistically significant relationship between Working Capital Financing Policy and Return on assets.

Above analysis found that the poor cash management or liquidity shortages in liquidity can significantly disrupt production as well as workflow, and also the essential resources procurement. A firm's cash balance, liquidity and solvency largely depend on maintaining a satisfactory as to cover short-term requirements. The cash in short-term securities can be generated through extra revenue while investing extra cash, which contributes to the financial stability. During this process adopting a well-balanced method to trade receivables and payables, cash approach and inventory management helps the firms to alleviate risks through maximizing operations. Fostering sustainable growth and long-term success helps the organizations to align working capital strategies in a better way. In the field of manufacturing, the enhancement of financial stability ensures smooth production and effective working capital management. Excess inventory can stress the firm finance management by increasing storage, overhead costs and many other factors. Factors like quality driven practices like JIT can see the improvement in operational profitability and efficiently. When maintained optimal inventory levels this prevents uninterrupted workflow and production delays. For long survival in the market the manufacturing firms should concentrate on optimising cash flow towards catering strong relationships with suppliers which leads to maintenance of optimal continuity. Delayed and pending payments from the suppliers is too monitored for increase in working capital efficiency. A well-designed credit policy has to be established within the permissible limits which enhances liquidity which leads to manage payables effectively. This leads to boost in the sales through credit policy and ensures striking the right balance in the areas of increase in the risk of bad debts. When the firms offer earlier payment discounts and impose penalties for late payment can improve receivables turnover over a period of time which leads to strengthening financial routine in an overall way.

4. Conclusion

Kennametal India's approach to managing working capital reveals a complex relationship with its profitability. Although increased working capital is associated with higher sales, the negative correlation with the net profit ratio implies that this expansion may adversely affect profitability. This suggests that while growing working capital supports business growth, it could also lead to inefficiencies or additional costs that diminish profit margins.

The analysis further indicates that the working capital ratio is not a strong predictor of net profit, pointing to the possibility that other factors—such as operational effectiveness or strategic choices—might be more crucial in influencing profitability. The variability observed in Kennametal's return on assets (ROA) shows that while the company generally performs well, there is significant fluctuation in returns. When the manufacturing firms comes to cash collection and inventory maintenance, the firm competently performs a fast cash collection method than using a longer inventory period. This is also known from the above analysis that longer or extended dates for inventory will lead to overall cash flow. The Regression Analysis method shows that Kennametal's working capital ideates that accounts payable and receivable periods do not effectively have an impact on inventory management and ROA. The analysis also indicates that the operational efficiency and various strategic decisions plays a predominant role in understanding asset return. Throughout this research study it is found that Kennametal India adopts working capital management system fine-tuning its strategies accordingly to the resources available towards achieving a balanced risk and return. This strategy when adopted reflects to the practical approach and manages working capital which leads to overall market demands and enhancement in financial conditions.

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