A CRITICAL ANALYSIS OF INTERPLAY BETWEEN VARIOUS COMPONENTS OF WORKING CAPITAL FOR MSMES' ENGAGED IN PROJECT-BASED MANUFACTURING – INDIAN CONTEXT

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ABSTRACT

The study involves an empirical analysis of factors influencing cash holding by MSME's manufacturing substitutes for defence aviation sub-assemblies in India. Quantitative research methodology with correlation design establishes the relation between cash holding and the components of working capital. The univariate data analysis indicates that cash and cash equivalents constitute 14.14%, inventory 24% and trade receivables 42 % of the current assets. The panel data regression analysis with trade receivables as the independent variable explains 50 % of the variability of cash holding and has significant impact on cash holding. The research is unique as it focuses on the relationship of cash holding with the working capital components for low volume labour intensive project nature of manufacturing by the MSMEs.

Keywords: Cash Holding, Working Capital Components, Project-Based Manufacturing.

INTRODUCTION

Diligent management of working capital and especially decision on how much cash to hold assumes importance in respect of MSMEs involved in project-based manufacturing. Project-based manufacturing is characterised by the design and development of technology-intensive low volume production manifest the project-based manufacturing nature. Another significant departure from conventional manufacturing is that there is no guarantee for a continuous stream of future orders. Project-based manufacturing is typically manifested in the manufacturing of the components for space mission and indigenous substitutes for defence sub-assemblies.

The present research focuses on project-based manufacturing of electrical and electronic subassemblies for defence indigenisation. The process involved in designing a substitute needs an element of research and development for each product. Another critical aspect of these production activities is low-volume, but technological intensive design and development

activity with no-repeat orders. The uniqueness of each product increases the degree of difficulty in managing inventory and constantly developing newer process, making each production activity analogous to project execution.

It thus forces one to believe that these challenges necessitate exploring new avenues for devising optimal cash holding policies vis-a-vis trade payables, trade receivables, and inventory held to mitigate its probable adverse impact on the profitability of the MSMEs.

This paper's remainder proceeds as follows: Section 2 reviews the literature, followed by section 3, which focuses on the compelling requirement for researching the topic. Section 4 deliberates on research design, hypothesis development, data collection, defining variables, model development, and analysis tools. Section 5 presents the numerical results and analysis, followed by concluding section 6.

LITERATURE REVIEW

The non-linear relationship between the current assets and the production output is not linear indicate that even with a more significant proportional investment in current assets, only a few output units are produced (Horne & Wachowicz, 2008). Whalen (1966) concludes that the firm tends to hold the cash for meeting the excess difference between disbursement vis-à-vis the receipts.

Deloof (2003), states that firms can create value for their shareholders by reducing Trade Receivables and inventories. Teruel et al. (2007), Bellouma (2011), and ENOW et al. (2014) prove a significant negative correlation between the return on assets and the working capital components.

Padachi (2006) empirically proved that high investment in inventories and Cash Receivables is associated with lower profitability. Luhar and Sharma (2006) prove an inverse relationship between the Current Ratio and Return on assets. Ramachandran and Muralidharan (2009) research indicate a negative relationship between EBIT and Accounts Payable Days.

Gandhi et al. (2011) prove that 97 % of the smaller enterprises are deprived of institutional credit. Ali and Syed (2012) proved a positive impact of working capital management on its profitability and total assets. Bashar (2012), empirically prove difficulties faced by the SSI in financing current assets.

Addae (2013), concluded that the firm could increase its profit by early payments to the suppliers and early collection of customers' payments with reduced stock. Shubita (2019) proves that firm size and cash flows are strong predictors of the cash holding levels.

NEED FOR RESEARCH

The research to date highlights the importance of Working Capital management for MSMEs. The researches have brought out positive, negative, and at times nil relationship between the components of working capital and profitability. The present study focuses on the challenges faced by MSMEs engaged in project-based manufacturing. The perceived complications emanating from the project nature of manufacturing and the importance of holding cash against the opportunity of losing the bidding process has motivated to analytical analyse the relationship of cash holding with components of working capital viz., Trade Payables, Inventory, and Trade Receivables.

The significance of the present research lies in its attempts for contribution to the policymakers as input for evolving user-friendly policies, for the professionals & managers to review current practices and for the body of knowledge for future research. The study provides empirical evidence on the relationship between cash holding and working capital components of 50 registered MSMEs engaged project nature of manufacturing, supporting defence indigenisation.

FRAMEWORK BUILDING

The cash budget is primarily prepared based on the expected timings and magnitude of cash receipts and cash payments. In project-based manufacturing, the production overruns depend on the complexities involved in designing a product. Thus, the predicted cash flows are subject to more significant uncertainties. The optimal cash balance figure is typically arrived at by balancing the opportunity cost of holding the cash and the transaction cost on selling the marketable securities. In project-based manufacturing, another variable of opportunity cost is the firm's loss of opportunity to not participate in the project due to the non-availability of sufficient cash.

The sales happen only on credit with little or no control over trade receivables. Also, the uniqueness in each product reduces the probability of utilising inventory for different products. The research attempts to answer the primary question: What is the nature of interdependence manifested by Cash Holdings with working capital management components in project-based manufacturing? The study's objectives are to analyse the relationship between cash holding and working capital components, namely trade receivables, inventory, and trade payables.

RESEARCH HYPOTHESES

The research progresses to analyse the relationship of cash holding with components of working capital by defining the following hypotheses:

H0. There is no significant relationship between Cash Holding and Trade Receivables.
H1. There is a significant relationship between Cash Holding and Trade Receivables.
H0. There is no significant relationship between Cash Holding and Trade Payables.
H2. There is a significant relationship between Cash Holding and Trade Payables.
H0. There is no significant relationship between Cash Holding and Inventory.
H3. There is a significant relationship between Cash Holding and Inventory.

RESEARCH METHODOLOGY

The study follows a correlation design with a quantitative methodology on the selected sample. The secondary data of 50 registered MSMEs was collected for five years 2014 – 15, 2015 – 16, 2016 – 17, 2017 – 18 2018 – 19 from the financial documents. To achieve 95 % confidence in the correctness of the decision to reject the Null hypothesis, the level of significance chosen is 5 %. The research uses two-tailed tests to reject the Null Hypothesis.

ASSUMPTIONS AND MODEL BUILDING

Cash holding (CH) is an essential parameter for the MSMEs since they have to guard against

the opportunity cost of not participating in indigenisation. Hence, Cash holding is taken as the dependent variable to understand the interrelations with other components before deciding to evolve an optimum policy on how much to hold.

Whenever the credit sale of manufactured products happens, the sales get converted into Trade Receivables (TR). Due to the research and development nature of manufacturing, the products may, at times, not meet all the specification and may undergo an iterative design process, thereby delaying receivables. Hence it is imperative to understand the relationship of trade receivables with cash holding, and is taken as one of the independent variables.

The conventional inventory management models are most suitable for steady production and steady demand with repeatability in production activities. In the case of project-based manufacturing, demands will be for one order and with very little probability of repeat order. Also, the spares procured for designing a particular product may not help manufacture different products due to each product's uniqueness. Hence, it is crucial to understand the relationship manifested by cash holding with the inventory held (Inv) and is taken as the independent variable.

Trade payables (TP) are a form of short-term financing. The MSMEs may resort to this to ensure the availability of cash. However, the decision may hinge on the availability of liquid assets, and therefore, it becomes quite essential to understand the relationship between trade payables and cash holding. Hence trade payables are considered as an independent variable.

The Asset Turnover Ratio (ATO) is an efficiency ratio that indicates how efficiently the company is using its assets to generate revenue and hence is used as a control variable. The leverage ratio (Lev) indicates the asset financing pattern of the MSME and hence is considered the control variable. Short-Term Borrowings (STB) have a financial cost attached to them and is taken as the control variable. Profit Before Interest and Taxes (PBIT) is taken as a control variable. Also, the revenue earned from the operations (Sales) aid the availability of liquid assets and is considered a control variable.

Pearson's correlation coefficient establishes the correlation between the dependent and independent variable. Random Effect Panel Data Method used for regression analysis.

RANDOM EFFECT PANEL REGRESSION ANALYSIS MODELS

Model 1: $\text{Log (CH)} = \beta 0 + \text{Log } (TR_{it})^* \beta 1 + \text{Log } (PBIT_{it})^* \beta 2 + \text{Log } (Sales_{it})^* \beta 3 + \text{Log } (ATO_{it})^* \beta 4 + \text{Log } (Lev_{it})^* \beta 4 + \text{Log } (STB_{it})^* \beta 4 + \varepsilon$

Model 2: $\text{Log (CH)} = \beta 0 + \text{Log } (Inv_{it})^* \beta 1 + \text{Log } (PBIT_{it})^* \beta 2 + \text{Log } (Sales_{it})^* \beta 3 + \text{Log } (ATO_{it})^* \beta 4 + \text{Log } (Lev_{it})^* \beta 4 + \text{Log } (STB_{it})^* \beta 4 + \varepsilon$

Model 3: $\text{Log (CH)} = \beta 0 + \text{Log } (TP_{it})^* \beta 1 + \text{Log } (PBIT_{it})^* \beta 2 + \text{Log } (Sales_{it})^* \beta 3 + \text{Log } (ATO_{it})^* \beta 4 + \text{Log } (Lev_{it})^* \beta 4 + \text{Log } (STB_{it})^* \beta 4 + \varepsilon$

HYPOTHESIS TESTING

Since the research aims to study the correlation between various components of the working capital and profitability where we do not know about the population variance, the research uses the 't' test for the coefficient of correlation to

determine whether the coefficient is statistically significant for accepting Null Hypotheses. The conclusion is based on the acceptance or rejection of the null hypothesis. F test is the regression model's overall significance test with individual parameter significance done through the 't' test.

NUMERICAL RESULTS AND ANALYSIS

The univariate analysis (Table 1) indicates that Cash and Cash equivalents comprise 14 % of the current assets. The trade receivables form 42 % of the current assets, and inventory is 24 % of the current assets. The trade payables are 38 % of current liabilities. The Trade Receivables (TR) are 2.23 times Trade Payables (TP), which may be a severe threat to MSMEs' effective and long-term sustainability. The current assets are 58% of the total assets. The assets turnover ratio of MSMEs is 0.72, meaning that for every Rs.1 of assets deployment, the company is generating Rs.0.72 in revenues.

Correlation analysis between various variables is placed in Table 2. The Hausman test suggests the use of Random Effect Panel Data analysis. The results of Random Effect Panel Data analysis for three models are placed at table 3.

Model 1 random effect panel data regression with Trade Receivables as independent variable explains 50% of the variability in cash holding. The model indicates a negative relationship at less than 1 % of significance level between cash holding and trade receivables, asset turn over, Short-Term Borrowings, and leverage. Thus, rejecting Null Hypothesis. The coefficient analysis indicate that every rupee increase in trade receivables would decrease cash holding by 23 paise.

Model 2 random effect panel data regression with inventory as the independent variable explains 46 % of cash holding variability. The regression results indicate that inventory is negatively related to Cash holding at 10 % of significance level. Thus, the Null hypothesis is accepted at 5 % of significance level, indicating no relationship between inventory and cash holding. Model 3, with trade payables as an independent variable, explains 46 % of Cash Holding variability. However, the trade receivables manifest an insignificant negative relationship with cash holding, thereby accepting the Null Hypothesis. The results indicate that trade receivables have a significant impact on cash holding. Furthermore, trade receivables account for 42% of the total current assets. Thus, increased trade receivables may stretch the cash conversion cycle, thereby straining cash and cash equivalents' availability. It is thus critical for MSMEs to reduce the quantum of cash receivables. One of the options that can be relied upon is factoring. Another instrument that the MSMEs may use is a Letter of Credit (LC). Securitisation of trade credit is an alternative financing source that needs to be explored for effective working capital management.

CONCLUSION

Access to timely finance is of utmost importance to the MSMEs involved in project-based manufacturing. The research brings out a more significant influence of trade receivables on cash holding. Also, since trade receivables are 2.23 times trade payables, implying strained long-term sustenance. The receivables form 42 % of current assets. Thus, there is an urgent need to evolve policies assisting MSMEs in optimising trade receivables for long-term sustainability.

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APPENDIX-1

Table 1: Univariate Analysis

Variable	Mean	Std_dev	Median	Remarks
Cash and Cash Equivalent	54149554.92	120907756.6	5008398	14.16 % of Current Assets
Trade Receivables	162571291.6	316480861.3	40121587.5	42.53 % of Current Assets
Inventory	90698595.74	231368490.3	14745126	23.73 % of Current Assets
Trade Payables	72865663.76	141395729.9	15162656.76	37.55 % of of Current Liabilities
Cash Conversion Cycle	168.5726675	274.3525782	104.6224619	168.57 average days for MSMEs to convert investments into cash flow
Total Debt	101017140.1	195029772.7	26196544	15.13 % of Borrowed funds support assets of the MSME
Long Term Borrowings	51063778.33	114770889.3	3630685.5	50.55 % of Total Debt
Short Term Borrowings	49953361.75	100012408.9	11734221.73	49.45 % of Total Debt
Total Assets	667623284.4	1252597318	124953677	The total assets turnover ratio of MSMEs is 0.72.
Current Assets	382287453	751233842.2	75472609.5	57.26 % of Total Assets
Current Liability	194031976.6	325091179.3	59896954.57	29.06 % of Total Liability
PBIT	59089940.75	170979508.3	4992816.71	8.85 % average earning power of MSMEs
Operational Revenue	478607255	955197027.4	109132905.5	-

Table 2: Univariate Analysis

Variable	CH	TR	INV	TP	CCC	STB	OPR	PBIT	ATO
CH									
TR	0.65								
INV	0.62	0.70							
TP	0.75	0.81	0.66						
CCC	0.11	0.32*	0.42	0.221*					
STB	0.45	0.51	0.54	0.545	0.452				
OPR	0.82	0.83	0.74	0.904	0.275*	0.560			
PBIT	0.51	0.40	0.40	0.468	0.108*	0.144*	0.527		
ATO	0.31*	0.19*	0.46	0.050*	0.464	0.50	0.286*	0.307*	
Lev	0.51	0.54	0.51	0.577	0.359	0.352*	0.589	0.425	0.48

Notes. * No correlation manifested

Table 3: Panel Data Regression Analysis

Dependent Variable	¬	Parameter	Std Error	t-Stat	p-Value	Result Reject H0 if t > tα1.96 or p-value < 0.05	R Square	Adjusted R Square	Analysis	VIF	Analysis: No Multi-collinearity if VIF < 10
Log CH	Constant	-1.078695	0.6337	-1.7021	0.0903	False	0.517	0.50256	50% of the variability in the dependent variable explained.		
	Log TR	-0.233538	0.0380	-6.1405	4.52E-09	TRUE				2.36	
	Log ATO	-0.806096	0.1990	-4.0505	7.37E-05	TRUE				1.34	
	Log Sales	1.233468	0.0859	14.3491	< 2.2e-16	TRUE				1.92	TRUE
	Log STB	-0.038541	0.0146	-2.6263	0.009318	TRUE				1.16	
	Log PBIT	-0.006113	0.0193	-0.3161	0.752292	FALSE				1.26	
	Log Lev	-1.332859	0.8973	-1.4854	0.1390	False				1.17	
Log_CH	Constant	-1.09244	0.6257	-1.7458	0.0824	False. Significant at the 10% significance level	0.48224	0.46631	46% of the variability in the dependent variable explained.		

	Log Inv	-0.03626	0.0214	-1.6886	0.0928	False. Significant at the 10% significance level			1.50	
	Log ATO	-0.6874	0.2309	-2.9765	0.003	False. Significant at the 10% significance level			1.40	
	Log Sales	1.0347	0.0835	12.3789	< 2.2e-16	True			2.03	
	Log STB	-0.0394	0.0132	-2.9797	0.0697	False(10% Yes)			1.16	
	Log PBIT	0.00399	0.0159	0.2508	0.8022	FALSE			1.26	
	Log Lev	-0.8766	0.8826	-0.9931	0.3219	FALSE			1.18	
Log_CH	Constant	-1.0137	0.6257	-1.6199	0.1068	False	0.48103	0.46506	46% of the variability in the dependent variable explained.	TRUE
	Log TP	-0.0228	0.1304	-0.1748	0.8614	FALSE			2.76	
	Log ATO	-0.6462	0.2314	-2.7915	0.0057	TRUE			1.47	
	Log Sales	1.01438	0.1564	6.4856	7.10E-10	True			2.98	
	Log STB	-0.0409	0.0127	-3.1964	0.0016	TRUE			1.16	
	Log PBIT	0.00389	0.0159	0.2446	0.8070	False			1.26	
	Log Lev	-0.7820	0.8745	-0.8942	0.3723	False (True for 10 %)			1.18	