

CHAPTER 06 - CONCLUSIONS, IMPLICATIONS,

LIMITATIONS AND FUTURE WORK

6.1 Chapter Overview

This chapter concludes with discussing the objectives, method and findings of this research, offers a brief of the entire research along with implications for theory and practice for stakeholders. Additionally, it highlights the limitations and presents future avenues for extending the current work that could be beneficial for interested researchers and other parties.

6.2 Conclusions

The main aim of this study is to develop a WCM efficiency model using multi-stage data envelopment analysis and investigating firm-level as well as macro-economic characteristics influencing the Indian manufacturing sector. A sample of 1391 Indian manufacturing firms divided into nine industries for a period from 2009-2020 was used for the analysis.

The current study performs SBM-DEA model using CCC components i.e. receivables period, inventory conversion period, and trade payables period as inputs and return on assets as output for calculating the WCM efficiency of the Indian manufacturing sector. Further, panel data fixed effect model, which allows us to control for potential endogeneity problems and unobservable heterogeneity, was used for examining the influence of selected determinants on the WCM efficiency of Indian manufacturing firms.

Moreover, ANN was employed for validating the proposed model and relative importance of selected determinants on WCM efficiency was performed using sensitivity analysis. The findings revealed the constant efficiency levels in these industries throughout the study period.

Specifically, the mean efficiency scores for most of the manufacturing industries were around 40-50 percent entailing that industries are operating at half of their WCM efficiency capacity. CFLOW, TFA, SIZ, AGE, PRD, LEV, CEF, IC, SC, HC, GRT, GDP, and INT were used for investigating the individual effect and their relative importance towards WCM efficiency. CFLOW, PRD, TFA, LEV and GRT came out to be significant predictors ranging from highly important to lesser.

Contrasting to previous findings, our results revealed that capacity to generate internal resources, productivity, tangible fixed assets, leverage, and growth hold a significant relation towards efficient working capital management, the understanding on which have been largely ignored till now. Hence, requiring working capital managers to take care of internal as well as external factors while determining the investment in working capital for continual value creation for the firm. Also, they must try to achieve the optimal level of working capital that would add to the value of the firm.

To conclude, the current study highlights the importance of working capital management efficiency for the Indian manufacturing sector, which influences the investment levels in working capital and further impact the whole short-term processes of the firm. Although there have been studies on the association of working capital with firm-level determinants, the idea that efficient management of working capital influences the whole value chain of the firm enjoys widespread acceptance. The evidence found may be of interest to the sub-industries prevailing under the manufacturing sector and related counterparts. Also, the findings of the current study would assist the stakeholders in choosing optimum governance structure and creating informed strategies for their supply chains. Further, the current study enlightens on the prevailing situation of WCM efficiency in the Indian manufacturing sector and highlight the scope of improvement considering

the determinants influencing it the most. The current study also taps on the long-term sustainability of manufacturing firms by suggesting improvement in responsiveness of firms towards inventory management, trade credit, payables period, cost of financing etc. Additionally, the current study suggests managers, manufacturers, investors, etc. to focus on providing quality products without any delay in supplies as it might impact the credibility and business potential of the Indian manufacturing sector.

6.3 Implications for Theory and Practice

The findings of the current study have several implications for industry managers, practitioners, investors, academicians, and other stakeholders. The current study investigates the efficiency of managing the working capital in a totally new standpoint. This research offers an assessment of WCM in Indian manufacturing firms with emphasis on its efficiency, trends, determinants, and classification of significant variables in terms of their importance. This study leads to numerous stimulating results and insights into the manufacturing sector's functioning.

This research contributes by proposing a new measure for assessing the WCM efficiency which does not only overcome the issues of traditional measures but also provides added advantages. This proposed measure may act as an aid in effectively managing the working capital that can be utilized by various stakeholders and interested parties and would lead to better assessment of firm's short-term liquidity management.

The results of this study provide ample prospects to the financial managers by extracting valuable insights by assessing and benchmarking their WCM against its peers within the industry using new proposed measure. This would assist the managers to gain more understanding of the areas they are lacking and provide a benchmarking level to be achieved to become as efficient as

its rivals. The new proposed efficiency measure is flexible enough to be amended for any industry or condition for quantifying WCM efficiency in a coveted approach. Hence, assisting the analysts and financial executives in executing the WCM efficiency under diverse business situations.

This research offers vital comprehensions on the WCM efficiency in Indian manufacturing sector in conjunction with efficiency assessment of each industry. Hence, this provides the government bodies and policy formulators with a clear picture of the prevailing liquidity levels, efficiency, relative strength and capability in liquidity management in the manufacturing sector and its industries. Additionally, these results could be adopted by the industries and policy makers in taking financial decisions and policy formulation for development and enhanced performance of the manufacturing sector.

The current study lays emphasis on the determinants influencing WCM efficiency including firm-level as well as macro-economic determinants. The results give out a better vision to financial managers concerning the factors behind WCM efficiency and rulings to enhance the efficiency. The results indicate that each industry is affected differently by the determinants and some determinants are within the control of the firm and some are outside its control. Thus, management must consider the determinant analysis before taking liquidity associated judgements. Furthermore, this determinant analysis would also support the government in formulating specific policies incentivizing each manufacturing industry as well as the whole manufacturing sector.

This research is an attempt to offer new evidence towards a better knowledge of the short-term liquidity management of manufacturing firms of developing economies such as India. Additionally, this study accompanies empirically to the existing research on WCM and augments to the mounting literature on management of liquidity in modern firms.

Along with the implications, we suggest several ways that could be adopted by the policy makers, financial managers, stakeholders, and other interested parties for gauging the efficient levels of WCM, focusing on the significant determinants, and exploration of the most vital predictors influencing WCM efficiency the most.

First, implementing WCM practices efficiently benefit firms not only based on their internal level indicators, but also because of external and macro-economic factors. Industry managers, thus, needs to reinforce the significance for such indicators. Second, in terms of achieving WCM efficiency, industries have progressed differently through various levels. For practitioners in the chemical & chemical products, consumer goods, food and agro-based products, and textiles, bigger prospects for improvement persist. Third, a substantial variation and skewness among all the selected industries indicates high inconsistency in WCM within individual industries. Hence, creating opportunities for managers to work towards improving the efficiency and performance in straggler firms by following the efficient firms or firms with best practices. Such opportunities are supposed to be best for smaller firms, but are required for some large size firms too. Fourth, the current study reveals large variation among selected industries regarding the WCM efficiency or liquidity measure. While specific levels of liquidity are necessary and inescapable, the mangers need to focus on the unwarranted costs and lost profits which are borne by the firms and emerges from holding excessive liquidity. Hence, financial managers must focus on reducing or eliminating such losses by actively implementing liquidity management strategies. Also, firms that lack expertise in liquidity management could try adopting improvement measures that shorten the CCC without altering sales or operating margin, that would lead to value creation in firms. Consequently, despite being limited in ability to foresee uncertainties or adverse events, firms need to be ensured in terms of cash availability, irrespective of the situations. Fifth,

employing various techniques such as just in time system, receivables' factoring, credit insurance, etc. would also add to efficient liquidity management in firms.

Since the current study highlights working capital levels and its efficient management through firm-level and macro-economic determinants, such practices are likely to influence the operational, economic, and financial aspects of Indian manufacturing firms. Further, looking at the constant efficiency scores of Indian manufacturing firms, the managers and related parties must be concerned about the working capital, because there is a cost of moving away if optimal levels of working capital are not achieved (Seth et al., 2020). Also, most of the firms falls on the lower side of the efficiency values or are inefficient in comparison to the efficient ones, which needs consideration.

Additionally, manufacturing firms may draw information from the results of the study to measure their current working capital levels and performance, and consequently implement targeted efficiency improvement initiatives. Any manufacturing group with an aim to benchmark their WCM efficiency could adopt the determinants model used in the current study. This model might act as a tool for policy makers to envision the characteristics of the firms' performance even if the firm is not a part of the sample. While policy makers can work towards developing focused schemes for ensuring the long-term viability in firms, individual manufacturers, investors, academicians etc. can yield benefits from the findings of this study and develop business cases in order to augment their firms' WCM efficiency and performance.

By detailed comprehension of the role and drivers of WCM and undertaking continual measures for reaching "right" working capital levels would effectively prepare the firms from uncertainties, minimize the risk, and enhance the growth and overall performance (Morio, 2014).

In India, mostly small and medium enterprises (SMEs) are suppliers for large manufacturing firms wherein the limited capacities of SMEs lead to operational inefficiencies and lacks in timely delivery of materials. Such capacity constraints must be dealt with carefully in this growing demand era. Further, manufacturing firms must focus on developing alternate suppliers rather than a single supplier for purchasing materials or services as this would assist the firms during crisis period when there is lack of sources for availing the materials. Also, availing supplies from multiple sources would help the firm in keeping an eye-check on purchase in terms of quality and price. Furthermore, it would avoid the situation of monopoly suppliers that could inflate the prices or create disruption in supplies. Also, manufacturing firms must proactively engage in maintaining service schedules for their plants and follow stringent quality control measures. Ignoring such practices directs to lower production, failure to deliver products, and pose a serious threat to production quality.

Manufacturers or the financial managers must refrain from inaccurate forecasting on the usage of inventories, sales, future requirements of raw materials as it can hamper the firms' production plan and leads to recurrent adjustments. Considering the limited flexibility of suppliers in their operations, such adjustments makes it difficult for suppliers to fulfil the manufacturers' requests. Also, firms must provide technological support, effective training, adequate infrastructure and develop an understanding of just-in-time and lean manufacturing practices among employees or workers for maximum productivity. While Indian manufacturers face severe difficulties in terms of accidents, bad roads, state-wise entry barriers, delays at transshipment ports force them to keep access inventories to deal with unreliable delivery schedules. Thus, a need arises to capture a working capital model comprising of functional barriers, industry barriers, and

individual barriers along with economic and demographic influencers that could lead to efficient WCM.

For practitioners in chemicals & chemical products and food & agro-based products, bigger opportunities for improvement remain. Second, the highly significant skewness and inconsistency in efficiency values across all industries signifies managerial prospects by way of advancing progress in laggard firms. This requires benchmarking strategies and best practices followed by the efficient firms. This might be of greater help for smaller firms but could be useful in larger firms as well. Third, internal along with external operational key performance indicators are responsible for better implementation of WCM practices and efficiency achievement. This fortifies the prominence of such efforts for manufacturing industries.

Considering the crucial role of manufacturing sector in development and economy's growth (Goel and Sharma, 2015; Seth *et al.*, 2020), the authors propose restructuring of the professional education system by the government for fostering competitive spirit, global mindset, and nurturing creativity. Such initiatives may empower the manufacturing sector with pioneering culture, dynamic competencies, universal experience, and robust network relationships. In addition to this, manufacturers, financial executives, working capital managers, and supervisors must be given adequate knowledge, training, and assistance regarding adopting and implementing of working capital components such as cash management, stock management, debtor management, and creditor management. This would add to the overall development and growth of the manufacturing sector and the economy. The firms may then become more capable to handle uncertainty and crisis by adopting adequate working capital levels and further lead to holistic performance in manufacturing firms. Also, policies could be formulated in lieu of the results of

the current study wherein the causal relationships among the criteria are determined that provide a better picture to the WCM efficiency and firms' performance.

6.4 Limitations

Like other studies, the current study also has certain limitations arising largely because of its scope, techniques, and methodology utilized for the analysis. Following are the broad limitations of the study:

- The study includes only the firms that were functional throughout our selected time period. Hence, the sample is restricted as per the operating firms only and limits the sample size that might be smaller than the population.
- This research adopted balanced panel data, keeping the same number of firms for every year for the analysis. Hence, older firms exiting before the study period and new firms emerging in the later years of our time period might not become part of our analysis.
- The study sample is restricted to manufacturing firms with regard to the vital role of WCM in these firms. Therefore, excluding other firms might have provided biased results.
- Since the study sample comprise of only those firms that are operating throughout the study period leading to biased results towards larger firms as small firms have higher failure probability.
- This study consists of only listed firms hence unlisted private firms present in large numbers in India does not form a part of our sample. The functioning of such private firms might differ from those of the listed firms and therefore might have led to a partial analysis.

- The time period taken in this study (2009-2020) has witnessed several effects of economic fluctuations such as recession and demonetization which other economies might not have faced in a similar manner like India. Hence, the current study lacks generalization of results.
- The DEA technique used for the analysis provides relative efficiency scores, wherein changing the sample might offer different results, hence, the results might be sample sensitive.
- The study has centered on a limited number of inputs and outputs, wherein, one of the vital inputs such as imported raw materials that cause a great challenge for WCM has been ignored and can be considered for future research.
- In line to the literature, the study has utilized the most vital determinants influencing WCM efficiency, however, influence on WCM efficiency might not be limited to just these determinants.

There is a scope for overcoming the above-mentioned limitations by forming an agenda for future research.

6.5 Future Work

The current study has numerous prospective avenues for future research. In consideration to the inputs and outputs, a sensitivity analysis may be performed with modifications in its values. Having taken a sample from a developing economy, the results of our study are generalizable only among developing contexts. Therefore, to overcome this shortcoming, we suggest a comparison to be carried out in a developed and developing economy. To overcome this generalization issue, future research can predict the industry-wise importance of the financial measures associated with

WCM efficiency. In line to this, future researchers can incorporate macro-economic variables, such as inflation rate or any crisis event which could provide for better analysis of WCM.

These are situations in which the companies may have had to switch their working capital strategies to adapt to the markets. Therefore, we suggest that future studies address these market variations and draw emerging trends to delineate the strategies to greater efficiency of WCM. Also, future work includes coming out with modelling for an optimized working capital structure that could help in overall efficiency of the short-term processes and could perform as a standard model for all the manufacturing industries or firms. Consequently, further improvement could be done to obtain an advanced form of concepts towards improvement of explicit features of WCM efficiency in Indian manufacturing firms. Hence, the combined approach of DEA and machine learning algorithm-based model may well be integrated with another standalone efficiency model with the aim of leading towards a more distinguished and robust approach. This remained beyond the of the current study and may possibly be undertaken in the future.

The future research can also integrate more variables and embrace the WCM efficiency not just as short-term financial strategic vehicle, but also as a base for formulation, implementation, and evaluation of pluridisciplinary decisions that eventually maximize the profits. Additionally, manufacturing firms usually maintain higher levels of cash, raw materials, receivables, and operating profits which differs from other industries. Hence, future researchers can investigate the working capital statuses for diverse industries differing from the manufacturing industry and compare the results to draw implications for stakeholders involved in WCM.