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Supply Chain Issues in Medium Scale Auto Component Manufacturers: Case Study Approach

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Abstract: This research paper gives an insight about the supply chain issues occurring in medium scale enterprises (MSE). The medium scale industries are the intermediate industries between small scale industries and tier-1 companies. Their role is most important by managing small scale industry suppliers without compromising quality and also satisfying tier-1 companies to sustain in the present vibrant market. In this context the conceptual model is designed considering supplier issues, production issues, financial issues, logistics issues and human resource issues as independent variables and financial performance, technical performance as dependant variable. The supply chain management (SCM) and supply chain risk management (SCRM) are partially practised without a dedicated team of employees. The authors of this paper are suggesting practising SCM and SCRM from the beginning of the product life cycle and are suggesting as moderating variables. This conceptual model is validated based on the responses obtained from top officials of three auto component manufacturing medium scale industry (MSE) located near Chennai.

Key words: Medium Scale Enterprises (MSE) · Supply Chainmanagement (SCRM) · Supply Chain Management (SCM) · Original Equipment Manufacturer (OEM) · Gross Domestic Product (GDP)

INTRODUCTION

Supply chain risk management (SCRM) is a field of escalating importance and is aimed at developing approaches to the identification, assessment, analysis and treatment of areas of Vulnerability and risk in supply chains [1]. Supply chain management literature has already identified a number of strategies and practices that can help to reduce supply chain risk, such as supplier quality management, supplier development, risk mitigation strategies, contingency planning and crisis management [1]. Automobile is one of the leading and developing industries in India. Various automobile and auto components manufacturers have setup industries in several parts of India. The Indian auto manufacturers are suddenly exposed to a fast development in the recent years. The competetion among the automobile manufacturers have increased due to various developments in products. Chennai is known as the Detroit of Asia. The city and surrounding areas accounts for 60 per cent of India's automotive exports. Chennai has a market share of around 30% of India's automobile industry and 35% of its auto components industry. Chennai will turn out close to 1.5 million vehicles a year CMIE. The auto component is also a growing market in chennai. The suppliers have to give a good product with lesser cost in a promised time, which will make the suppliers to be stable in the autocomponent market. India is developing in this field as the man power cost is less with greater potential to do work. The rule of "survival of the fittest" is applied to all the auto components manufacturers. This study gives us a brief about the problems faced by the autocomponents manufacturers due to the demands of the OEMs [2]. More than any one U.S. In signs of slowing demand in the economy. Automobile production is expected to grow by 9.6% in 2012-13 as per data of Centre for Monitoring Indian Economy (CMIE) [3]. This is lesser than 10.6% growth predicted for the same period earlier by CMIE. The auto component is also a growing market in Chennai.

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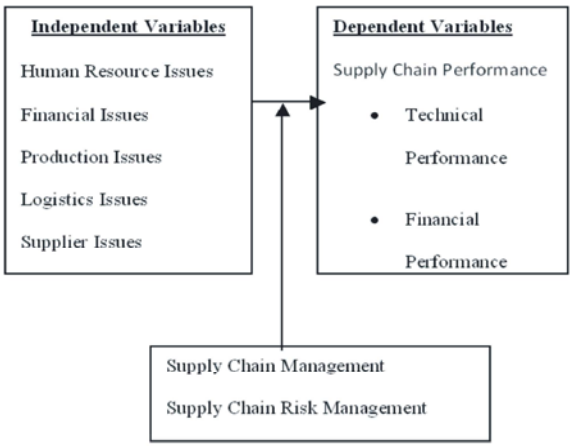
Literature Survey: Those MSEs, which lack access to basic infrastructural facilities and which could not strengthen their competitiveness, would have exited from the market [5]. In Brazil, the automotive companies have the suppliers located near the manufacturing companies and this facilitates the modular consortia to work with the complex production forecast. [6] Capacity constraints or shortages as well as poor logistics performance (delivery reliability) derive from unsolved problems in the supplier's production and operations management. The bullwhip effect also plays a role here and has to be countered by the suppliers. Furthermore, poor quality in the purchased products or services is a significant risk and can have a domino effect through the supply chain to the final customer [7]. The MSE is a fully labour dependant sector. There are numerous opportunities available these days but the major problem being that the workers tend to have a mindset of working only in Multi National Company (MNC). The workers prefer MNC because they find it better for their self-esteem and also they are provided with good food, transport and a better work environment [8]. However, the decline is more drastic in terms of growth of enterprises and employment relative to that of production and particularly, that of exports. While the growth of enterprises and employment has declined by almost 50 per cent, the decline in growth was less significant in production and only marginal in exports during the globalization period as compared to the pre-globalization period [9]. Generally it takes a long time to train a new worker. The time depends on the type of work. For e.g. in plastic moulding industries it takes 2-3 months for training a worker whereas in engineering maintenance works it takes up to 6 months to 1 year. A bright worker will take less time to learn the work. If not it may even take more than the estimated time.vigorous training and after the worker being well settled in the company, if they quit there are various losses faced by the MSE such as time loss, money loss and also the effort made by the trainee (owner the trainee in most of the MSE to train the worker is a waste and then again the owner has to appoint a new worker and train him for next six long months.Those MSEs, which lacked access to basic infrastructural facilities and which could not strengthen their competitiveness, would have exited from the market [10]. The easy availability of most raw materials and the relatively inexpensive workforce, the ingredients should have been in place for a sound manufacturing ecosystem in India [11]. Supply chain management literature has already identified a number of strategies and practices that can help to reduce supply chain risk, such as supplier quality management.

Conceptual Model: The conceptual model is designed based on different research literature review, expert's opinion and observation by researchers during the study of three companies. The MSEs have highest priority issues such as financial, HR, Supplier, production, logistics issues and next priority issues like environmental, socio-political issues. This research focuses only on highest priority issues and designed a conceptual model.



Independent Variables

Human Resource Issues: The fluctuation of demand and uncertainty in financial stability forces MSE to have only a limited number of permanent labours. Thus they employ some casual labourers in order to meet the increase in demands of the customers when necessary [12]. So they have to train the casual labourers in the meantime to work, which results in wastage of time and money for the MSE [13]. The MSE could not retain the manpower as the

labours get trained in the company and may leave them for better opportunities. They are not able to meet out the demands of the labourers as they expect high salary which cannot be met out by the MSE. Most of the MSE have to give allowances like rent, food etc. which affects their profit very badly. They also need to satisfy the bonus demands made by the workers. Moreover, many of the labourers in MSE prefer to work in OEM, TIER1 as those large scale companies provide better work environment, high pay, transport, good food. Moreover, their timings are fixed but in MSE the work pressure is more and hectic. Supervisor of one company explained such that"We are not able to hold a labour for more than 2 years. We do provide allowances but it goes in vain. Due to labour constrictions, we do not get new orders from OEM which is a hindrance to our company's development. Frequent leave taken by taken labourers fluctuates the production. Moreover, the MSE cannot deduct the salary for their absence. They should also to train the labourers to operate the machines and this cost is again bared by the MSE. E.g.:-It takes 5-6 months to train an employee in a press tool industry. After they get trained, they would move to other company if provided with high pay and better allowances. If they quit in recent time after getting trained it would result in time loss, money loss and effort made by trainee. Sometimes the Labourers are asked to work for over time in order to deliver the job in time for the OEM or T1 and also during the holidays. So the overtime payment is again bared by the MSE and not by the OEM or Tier1.The workers prefer MNC because they find it better for their Self-esteem and also they are provided with good food, transport and a better work environment [14]. Given the easy availability of most raw materials and the relatively inexpensive workforce, the ingredients should have been in place for a sound manufacturing ecosystem in India. Yet for long, manufacturing has been a poor cousin to the service sector, which accounts for 57% of national output. In other Asian countries at similar stages of development, manufacturing has contributed much more significantly towards national GDP, compared to India's 16%. Manufacturing in India contributes to a mere 15% of GDP, unlike other countries such as China (34%), Thailand (40%), South Korea, Poland, Turkey and Malaysia (approximately 26-30%).

In the recent past, we have taken cold comfort in the belief that India's manufacturing will never be mass-based like China's; nor will it be capital-intensive like Europe's or US's-it will be skill-intensive[15].

Financial Issues: The OEMs and the MSE suppliers are mutually dependent on each other. The OEM demands for the continuous supply of materials from the suppliers without affecting the production. In case of any financial instability the supplier shall not affect the productivity. In case of any financial crisis of suppliers, that too a single supplier,it may affect the production of the OEM or else the production has to be stopped until the financial crisis is solved. so every supplier is regularly audited every year [7]. The audit conducted every year focuses on the Turnover Growth, Dept Equity Ratio, Profitability, Assets, Quality Standards [9]. In case the supplier is a large scale manufacturer he is capable to handle the problem by himself. Or if the supplier is not financially strong he has to face financial instability [8]. The OEM industries are affected by financial instability of medium scale suppliers. Even then they were able manage the crisis by non-dependence of single supplier. Also they shall develop different SCRM capabilities for strategic and nonstrategic suppliers [7]. The financial instability of MSE have a positive effect on firms in that SCRM Capabilities was developed, which shall help firms to be better prepared for a future crisis, but also for 'usual' supply disruptions. A planned SCRM approach shall be implemented for effective prevention of disruptions on the supply side [7]. The MSEs financial instability has a significant correlation with economic growth in India [8].

Production Issues: Production problems are the most important issues for a auto component manufacturer, the problems include machine repair, supplier production or raw material arrival delay, labour problems, power cuts, tool wear, excess work load due to demands, quality problems etc. so the company has maintained a regular production schedule for every day manufacturing activities. If the production fails for a day, it will affect the supply to the OEM [2]. This may cause a bad remark on the MSE supplier from the OEM. Mostly inventory stocks are maintained in case of sudden production problems. The production of the OEMs is causing a rise in demand for the materials or products. so proper planning of production is important [4]. Some quality techniques like KAIZENS, 5S and Six Sigma are implemented in every automobile supplier to get a good quality and organised output. In MSEs the productivity improvement tools like lean manufacturing, quality tools are not fully implemented. The productivity improvement tools requiring much knowledge of statistics. The Indian engineers do not have more awareness of applying

statistics [14]. The authors suggested giving more training in the statistics and its applications for the engineers in an industry.

Logistics Issues: Logistics is an integral function of every MSE. It is a channel of supply chain which the value of time and place utility. In India, few raw materials are cheaper in places like hyderabad and bombay but it takes one month to deliver the raw materials whereas it takes only 10-12 days to deliver in local surrounding area where the costs are at a higher rate [11]. Another problem being faced by MSE is as most of the industries are outside the city it is very difficult to transport the raw materials as well as to deliver the finished products [10]. The logistic capabilities is one of the factor which influences the firm performance of the industry. In general, the pre and post sales services, market coverage, prompt delivery and low cost distribution are the logistics capabilities of any industry. The major elements of logistics costs for Indian Industries include transportation, warehousing, inventory management and other value added services such as packaging. India's spending on the logistics industry is much higher than the developed economies. The reason for high spending on logistics in India is attributed to poor infrastructure facilities, lack of implementation of IT in logistics and unnecessary check points at the National highways which wastefully increases the transportation costs [10].

Supplier Issues: The OEMs companies are bigger companies get products from the tier I suppliers. The tier I manufacturers get the parts from the tier II MSE suppliers. So there are various problems involved in the selection of suppliers. The OEMs have their own policy of purchasing a material from their suppliers. the purchasing policies or the SSP (Supplier Service Policy) are similar for all the levels of the suppliers as the suppliers are located in a same geographical location and some are vertically integrated in the products they manufacture [5].

Maintaining a purchasing policy will help the company to select a good supplier. The company has to see whether the supplier is well established, financially strong and capable of supplying continuously and with good quality systems. a good supplier is important to maintain continuous production. Supply side disruptions can materialize either inside or outside of a supply chain. The financial default of supplier and an earthquake that destroys production capacity. Subsequently the MSE looses their demand and customer satisfaction [15]. In MSE industry the high staff turnover, part-time employment and a multicultural employee base shall imposing heavy pressure on the day to day business processes [16].

Moderating Variables

Supply Chain Management: Supply Chain Management (SCM) is a key strategic approach for increasing organisational effectiveness and the realisation of organizational goals. Effectively selecting and evaluating suppliers and managing their involvement in the supply chain are some of the capabilities that enable Original Equipment Manufacturers (OEMs) to achieve customer satisfaction. From the OEM's perspective, the present work reinforces the fact that an organisation's management of its trading partners through proper selection, the building of trust, commitment towards written and unwritten agendas, having long-standing associations with supply chain partners, exchanging regular and timely information and joint problem-solving makes SCM efficient and effective [17]. The Indian industry shall align supply chain management with business processes for supply chain integration, form partnerships to minimize inventory and production cost. Most of the MSE industries does have specific practice of supply chain management as a policy and that to the partial implementation in the name of purchase policy and inventory policy [18]. Supply Chain Management is a very important department in the company which will give a very good indication about the logistics and supplies available in the company. Out of the three companies studied, all the three companies don't have a separate department or a concerned staff for supply chain management.

Supply Chain Risk Management: Supply risk management is the strategic and systematic harmonization of various business functions and the tactics across the functions in the supply chain. The management of risk in supply chains has now become an established, fairly recently, element in the fields of Supply Chain Management (SCM), corporate strategic management and Enterprise Risk Management (ERM). In addition to such cross-functional contributions, Supply Chain Risk Management (SCRM) contributes to the decision making processes in most functional areas within a business (e.g. marketing decisions concerning product delivery lead times; health and safety management within production operations) [19]. The management and maintenance of supply lies in the improved quality and

the reduction in cost of a product. The concepts such as (JIT) Just In Time and (JIS) Just In Sequence are used to maintain a good supply chain. The risk management over a supply chain has to be founded on the risk management in each of partner companies in the chain. The business relationship and operations dependence inevitably bind the management control efforts of partner companies together [20].

Dependant Variables

Technical Performance: Technical performance is based on the rejection rate of products, on time delivery, lesser cost production using the resources such as men, machine and material. The MSE has less number of skilled employees, less maintenance of machine and more usage of conventional machines. The measure of performance derived from the mentioned factor and it was mentioned in the model. Technical performance could be improved by the effective implementation of SCM and SCRM [15, 18].

Financial Performance: Financial performance refers to the net profit or loss gained by the company. The financial performance speaks for the company in satisfying the customer. Supply chain plays important role in the financial performance of the company. The financial performance could be improved by the effective implementation of SCM and SCRM. The measure of performance derived from the mentioned factor and it was mentioned in the model [15, 18].

Table 1: Statistics of independent variables

Independent Variables	Mean
Human Resource Issues	3.8
Financial Issues	3.66
Production issues	3
Supplies Issues	3.93
Logistics Issues	3.2

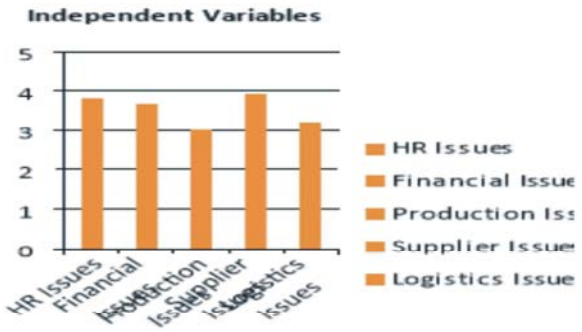


Fig. 1: Graphical representation of the issues faced by each company.

Table 2: Statistics of dependent variables

Dependent Variables	Mean
Technical Performance	3.13
Financial Performance	2.13

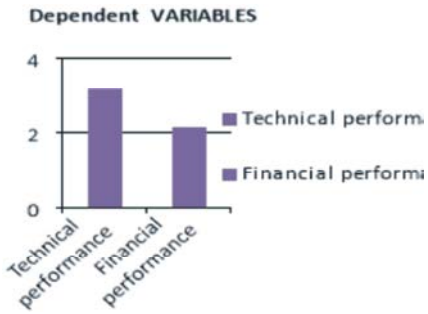


Fig. 2: A graphical representation of the Supply chain Performance

Research Methodology

Data Collections and Analysis: The authors personally observed three auto component manufacturing companies located near Chennai and simple questionnaire was prepared based on authors observation and information's from top level management executives. Then questionnaire was circulated to senior executives of all the three companies. Around fifteen responses were collected and analysed by descriptive statistics. Graphical representation is given below for the better understanding and interpretations of the responses.

Fig 1 is a graphical representation which depicts the various issues like the Human Resources issue, production issue, financial issue, supplier issue and logistic issues faced by the companies. This graph is depicted by taking the mean of the ratings given in the responses. The Table 2 and Fig 2 represents the dependent variables mean and its graphical representation.

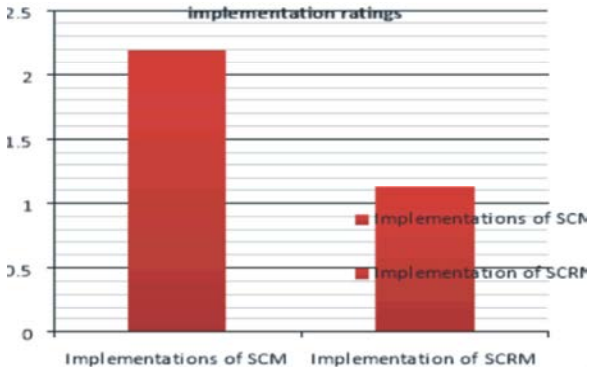


Fig. 3: A graphical representation of the implementation of SCM and SCRM by the three companies

Table 3: Statistics of moderating variables

Moderating Variables	Mean
Supply Chain Management (SCM)	2.2
Supply Chain Risk Management(SCRM)	1.13

The Table 3 and Fig 3 represent the moderating variables mean and its graphical representation.

CONCLUSION

Thus the various issues like, financial issue HR issue, Production issue, logistics issue and supplier issues are hindering the supply chain of the medium scale companies, in order to overcome these issues the MSEs must implement proper supply chain management techniques(SCM) and supply chain risk management techniques(SCRM) suitable to them. Separate department should be formed for supply chain management and employees should be trained in the field of supply chain management.

REFERENCES

1. Neiger, D. and K. Rotaru, 2009. Supply chain risk identification with value-focused Process engineering. Journal of Operation Management, pp: 154-168.
2. Jeshvin Vincent Hariharasudhan and S. Gopinath, 2012. Investigation of Critical Issues in a Micro and Small Scale Industries in India Advanced Materials Research Vols. 488-489: 1138-1141.
3. Sunil Kant Munjal-Manufacturing in India: why it must thrive. Insight, 9: 3.
4. Mauricio, F. Blos, Mohammed Quaddus and H.M. Wee and Kenji Watanabe, 2009. Supply chain risk management (SCRM): a case study on the automotive and electronic industries in Brazil, An International Journal, 14/4: 247-252.
5. Lee, Hau L. and Corey Billington, 1993. "Material Management in Decentralized Supply Chains," Operations Research, 41(5): 835-847.
6. Zsidisin, George, A., Alex Panelli and Rebecca Upton, 2000. "Purchasing Organization Involvement in Risk Assessments, Contingency Plans and Risk Management: An Exploratory Study," Supply Chain Management: An International Journal, 5(4): 187-197.
7. Constantin Blome and Tobias Schoenherr, 2011. ‘‘Supply chain risk management in financial crises-A multiple case-study approach”, International Journal on Production Economics, 134: 43-57.
8. Amalendu Bhunia and Somnath Mukhuti, 2012. ‘‘Financial Risk Measurement of Small and Medium-sized Companies Listed in Bombay Stock Exchange”, International Journal of Advances in Management and Economics ISSN: 2278-3369, May.-June. 2012
9. Atanu Chaudhuri, Peter Koudal and Sridhar Seshadri, 2010. ‘‘Productivity and capital investments: An empirical study of three manufacturing industries in India”, IIMB ManagementReview, xx, 1e15.
10. Sezhiyan, D.M., Tom Page and Paivi Iskanius, 2011. “The impact of supply effort management, logistics Capability and supply chain management strategies on firm performance”, International Journal on Electronic Transport, 1(1).
11. Stephan Vachon and Robert D. Klassen, 2002. “An Exploratory Investigation of the Effects of SupplyChain Complexity on Delivery Performance”, IEEE Transactions on Engineering Management, 49(3), August 2002.
12. Rafaela Alfalla-Luque, Juan A. Marin-Garcia and Carmen Medina-Lopez, 2014. ‘‘An analysis of the direct and mediated effects of employee commitment and supply chain integration on organisational performance”, International Journal on Production Economics, 5 July, 2014.
13. Rachel A. Dowty and William A. Wallace, 2010. “Implications of organizational culture for supply chain disruption and restoration”, International Journal on Production Economics 126: 57-65.
14. Alok Mathur, M.L. Mittal and Govind Sharan Dangayach, 2012. “Improving productivity in Indian SMEs”, Vol. 23, Nos. 10-11, October-November 2012, pp: 754-768.
15. Stephan, M. Wagner and Christoph Bode, 2008. “An Empirical Examination of Supply Chain Performance along several dimensions of risk, Journal of business logistics, 29(1).
16. Yiannis E. Polychronakis and Aris A. Syntetos, 2007. “‘Soft’ supplier management related issues: An empirical investigation”, International Journal on Production Economics, 106: 431-449.
17. Sahay, B.S. and Ramneesh Mohan, 2003. “Supply chain management practices in Indian industry”, International Journal of Physical Distribution and Logistics Management, 33(7): 582-606.

18. Srikantha Dath, T.N., Chandrasekharan Rajendran and K. Narashiman, 2010. An empirical study on supply chain management in India: the perspective of original equipment manufacturers and suppliers, European J. Industrial Engineering, 4(1).
19. George, A. Zsidisin and Bob Ritchie, 1995. Supply Chain Risk Management-Developments, Issues and Challenges, International Series in Operations Research and Management Science, 124: 1-12.
20. Liu, L., H. Daniels, M. van Oosterhout and J. van Dalen, 2013. Business Intelligence for Improving Supply Chain Risk Management, International Journal of Advanced Logistics, 2(2), December, 2013, pp: 18-29.